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Avengers (Dis)assemble? Climate Awareness, Responsibility Attribution, and Superpower Perceptions in Africa

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Abstract

Does climate awareness shape how citizens evaluate global powers? Drawing on Afrobarometer data from 38 African countries (N = 24,674), we show that climate awareness disassembles public opinion into a two-dimensional attribution mechanism involving cause and remedy that shapes soft-power evaluations. Climate-aware Africans rate China above the United States, penalizing the US for its climate record rather than the European Union, reflecting a clear climate-cognition mechanism. The US–China penalty is universal in direction but conditional in magnitude: it is deepest among consistent externalisers and shallowest among sovereign adapters. Robust placebo test confirms climate awareness significantly amplifies the US–China gap ($b = -0.019$, $p < 0.001$) but exhibits no effect on the EU–China gap ($b = -0.0002$, $p = 0.97$). Ultimately, American soft power deficits across Africa remain structural relative to China, demonstrating an overall magnitude depending upon public attribution frameworks regarding global climate responsibility and action.

1. Introduction

The global architecture of climate governance is fracturing, and the fault lines run directly through Africa. The 2017 announcement by the Trump administration to withdraw from the Paris Agreement marked a profound symbolic and practical retreat (Rhodes, 2017). As Zhang et al. (2017) argue, the withdrawal undercut the foundation of global climate governance, aggravated the leadership deficit, and reduced the emission space for other nations. Crucially, the US terminated its contributions to the Green Climate Fund, making it vastly more difficult for developing countries to finance adaptation (Zhang et al., 2017; Sanderson and Knutti, 2017).

This retreat has been framed as a strategic opportunity for China. Kemp (2017) noted that a withdrawal could make the US a "climate pariah" and provide a unique opportunity for China and the EU to boost their soft power. Today, that dynamic has shifted into a fierce race for green technological and diplomatic dominance (Chen, 2024). While the US retreats, China has moved aggressively to position itself as the provider of green solutions, deploying massive state-led industrial policies to dominate the global renewable energy market (Chen, 2024). Yet, as Hilton and Kerr (2017) caution, China's new role creates diplomatic complexity: it must reconcile its status as a developing country with the expectations of global climate leadership. Schreurs (2017) similarly notes that the EU has struggled to fill the leadership void left by the US, leaving a complex multi-polar landscape.

But how do African citizens perceive this shift? Climate awareness is rising across the continent—from 23% in Tunisia to 66% in Mauritius—driven by education, gender, and mobility (Simpson et al., 2021). Yet awareness alone does not produce consensus. Africans disagree sharply about who should bear responsibility for the crisis, with 45% pointing to their own government, 30% to ordinary citizens, and only 13% to rich countries (Andrews et al., 2025). Still, we lack a clear understanding of how this climate cognition shapes geopolitical evaluations. Existing work treats attribution as a single-choice outcome,

measuring who citizens blame without theorizing how beliefs about cause and remedy combine to structure their evaluation of competing global powers. This is the gap our paper fills.

To answer this question, we draw on Afrobarometer Round 10 data across 38 African countries (Afrobarometer, 2024). Because our theoretical framework requires respondents to hold a position on both the cause and the remedy of climate change, we restrict the sample to the 24,674 respondents who (a) reported having heard of climate change (Q60A = 1) and (b) gave a codable response on both the climate-cause item (Q61B) and the climate-remedy item (Q62D). "Don't know" and "None of these" responses on the attribution items are treated as missing. In contrast, on the 1–5 superpower influence ratings (Q67B, Q67C, Q67H), "Don't know" and "Refused" responses are recoded as the neutral midpoint (0.5 on the rescaled 0–1 scale), retaining 5,692 respondents who would otherwise be dropped from the rating models.

We argue that the US retreat provides the motivating context for a structural soft power penalty, but that this penalty is conditional on how climate-aware Africans cognitively frame the crisis. We demonstrate that climate-aware citizens disassemble into four distinct attribution frameworks. We show that the US is consistently evaluated less favourably than China across all groups, but the gap is deepest among "consistent externalisers" and significantly shallowest among "sovereign adapters" ($p = 0.035$). Crucially, a climate awareness comparison shows that climate awareness amplifies the US penalty by approximately 2 points ($b = -0.019$, $p < 0.001$), over and above a baseline penalty. By contrast, the EU penalty is not amplified ($b = -0.0002$, $p = 0.97$), indicating that climate-aware citizens discriminate between Western powers based on their climate records.

2. Theoretical Background

The US Retreat and the Opening for China. The literature on US climate diplomacy highlights a recurring pattern of inconsistency. The US signed the Kyoto Protocol but never ratified it, and in 2017, President Trump announced the US would cease all participation in the Paris Agreement (Rhodes, 2017). By withdrawing, the US undermined the universality of the agreement and set a bad precedent for international cooperation (Sanderson and Knutti, 2017). Furthermore, the US had pledged $3 billion to the Green Climate Fund; the Trump administration's decision to terminate these contributions severely damaged the Global South's capacity to adapt (Zhang et al., 2017; UNFCCC, 2017).

This retreat has been framed as a strategic opportunity for China. Chen (2024) notes that China has spent over a decade building a formidable green industrial base. As Zhang et al. (2017) advise, China faces mounting pressure to assume global climate leadership, and it has the opportunity to markedly enhance its soft power by filling the vacuum left by the US. However, Hilton and Kerr (2017) caution that China's new role creates complex diplomatic challenges, as it must balance its status as a developing country with its new leadership responsibilities.

Soft Power, Aid, and Public Opinion. The soft power literature has established that foreign aid and engagement can shape public opinion. Goldsmith et al. (2014) show that PEPFAR funding causally

improved US favourability in Africa. Blair et al. (2022) find that proximity to US aid projects increases affinity for the US while decreasing affinity for China, drawing on AidData's Global Chinese Development Finance Dataset (Dreher et al., 2022). Recent AidData working papers extend this by showing that indirect exposure to Chinese aid can improve sentiment, while direct exposure can have negative externalities (Wellner et al., 2022). However, this literature treats public opinion as a direct function of exposure to aid. It does not account for how citizens' prior cognitive frameworks filter their evaluation of superpowers. Nagao (2026) provides a recent update, showing that the 2025 USAID freeze cooled South African sentiment toward the US, but did not immediately translate into a surge of support for China. This suggests that the US penalty is not simply a function of what the US does, but is deeply rooted in how citizens frame global problems.

Climate Cognition and Responsibility Attribution. The study of climate cognition in Africa has moved from measuring literacy to measuring attribution. Simpson et al. (2021) established that climate change literacy varies widely across Africa, driven by education, gender, and mobility (see also Lee et al., 2015; Hornsey et al., 2016). Importantly, they distinguish between awareness (having heard of climate change) and literacy (awareness plus knowledge of anthropogenic causes). Our analysis focuses on the broader category of climate awareness. Andrews et al. (2025) advanced this by showing that Africans do not attribute responsibility uniformly: while 45% point to their own government, only 13% point to rich countries. Their work is a crucial advance, but it treats attribution as a single-choice outcome. It does not theorize the combination of beliefs about cause and remedy.

3. Theoretical Mechanism: The Disassembled Public

We theorize that climate attribution operates as a cognitive schema through which citizens evaluate global powers. We conceptualize two dimensions: cause (who caused climate change?) and remedy (who should fix it?). Cross-classifying these produces four frameworks:

- **Consistent internalisers** (domestic cause, domestic remedy) locate both the problem and the solution within their own society. For this group, the climate records of foreign powers are largely irrelevant. We expect them to exhibit a moderate US–China gap, reflecting baseline geopolitical sentiment.
- **Sovereign adapters** (foreign cause, domestic remedy) acknowledge that historical emitters bear responsibility, but insist the solution must be domestically owned. For this group, the US's climate record is acknowledged, but does not translate into an expectation of US action. We expect them to exhibit the shallowest US–China gap.
- **Consistent externalisers** (foreign cause, foreign remedy) assign both the cause and the burden of the solution to foreign actors. They are the most likely to hold the US accountable for its withdrawal from Paris and the most likely to view China favourably. We expect them to exhibit the deepest US–China gap.

- **Inconsistent externalisers** (domestic cause, foreign remedy) blame domestic actors for causing the crisis, yet expect foreign actors to solve it. We expect their US–China gap to fall between the internalisers and the consistent externalisers, though the prediction is less sharp.

Hypotheses.

H1 (Universal Penalty): Because of the US retreat from climate finance, the US will be evaluated less favourably than China across all attribution types.

H2 (Conditional Penalty): The US penalty will be significantly deeper among consistent externalisers than among the other attribution types.

H3 (Amplification): If the US penalty is driven by climate cognition, it should be significantly larger among climate-aware respondents than among respondents who have never heard of climate change. If the amplification is specific to the US and does not extend to the EU, this indicates discrimination based on climate records, rather than generic anti-Western sentiment.

4. Data and Methods

Data Source. We draw on Afrobarometer Round 10, a nationally representative survey across 38 African countries (Afrobarometer, 2024). The raw dataset contains 50,961 respondents. We restrict the analytic sample to 24,674 climate-aware respondents (Q60A = 1) who gave a codable response on both Q61B and Q62D. "Don't know" and "None of these" on attribution items are treated as missing. On the 1–5 superpower ratings (Q67B, Q67C, Q67H), "Don't know" and "Refused" are recoded as 0.5 (the neutral midpoint of the rescaled scale). This retains 5,692 respondents who would otherwise be dropped. We report a complete-case specification (N = 18,726) as a robustness check.

Dependent Variable. Respondents rate the perceived influence of China (Q67B), the US (Q67C), and the EU (Q67H) on a five-point scale from "very negative" (1) to "very positive" (5). Ratings are rescaled to a 0–1 interval: (Q67 − 1) / 4. We refer to the systematic US–China gap as a "penalty" to denote this relative evaluative discount.

Independent Variables. Cause (Q61B): 1 = "people, businesses, and governments in other parts of the world," 0 = domestic actors. Remedy (Q62D): 1 = "rich or developed countries," 0 = domestic actors. Cross-classifying produces the four frameworks. Controls include education, gender, age, urban residence, lived poverty, news-source count, and country fixed effects. Following the recommendation of Clark and Linzer (2015), we use fixed effects to absorb unobserved country-level heterogeneity, given the large number of cases per country.

Model Specification. Our primary specification is a survey-weighted respondent-level regression of the rating on the power (China, US, EU), the attribution type, and their interaction. We use the Combinwt_new_hh weight provided by Afrobarometer (2024). Standard errors are clustered at the

respondent level. The interaction terms capture the conditional US and EU penalties relative to consistent internalisers.

The Climate Awareness Comparison. We compare the US–China gap among climate-aware respondents with the same gap among the 22,433 respondents who reported never having heard of climate change (Q60A = 0). We pool the samples and estimate Rating = $\beta_0 + \beta_1$(US) + β_2(EU) + β_3(Climate-Aware) + β_4(US × Climate-Aware) + β_5(EU × Climate-Aware) + controls + country FE. A negative β_4 alongside a null β_5 indicates climate-aware citizens are discriminating between Western powers based on climate records.

5. Results

We report survey-weighted estimates throughout. The weights are well-behaved: the top 1% of respondents carry 5.3% of total weight.

Descriptive Statistics. The African climate-aware public is sharply divided. Consistent internalisers make up 43.4% of the weighted sample, followed by sovereign adapters (28.9%), consistent externalisers (22.6%), and inconsistent externalisers (5.1%) (Table 1). This reveals a striking asymmetry: while 51.5% blame foreign actors for causing climate change, only 27.7% expect foreign actors to provide the remedy ($p < 0.001$). Acknowledging external responsibility does not translate into a demand for external intervention.

Table 1. Distribution of Attribution Frameworks

Attribution Type	Cause	Remedy	N	Unweighted %	Weighted %
Consistent internaliser	Domestic	Domestic	11,082	44.9	43.4
Sovereign adapter	Foreign	Domestic	7,167	29.0	28.9
Consistent externaliser	Foreign	Foreign	5,219	21.2	22.6
Inconsistent externaliser	Domestic	Foreign	1,206	4.9	5.1
Total			**24,674**	**100.0**	**100.0**

Note: Cause and remedy are coded as domestic or foreign based on Afrobarometer items Q61B and Q62D. Weighted percentages use Combinwt_new_hh.

The Universal US Penalty. The US is consistently evaluated less favourably than China across all types (Table 2). Among consistent internalisers, the gap is −0.064. Among sovereign adapters, the gap is −0.049. Among consistent externalisers, the gap widens to −0.084. Among inconsistent externalisers, the gap is −0.059. Every group evaluates the US below China, supporting H1. The weighted gaps range from −0.049 to −0.084, equivalent to approximately 0.12 to 0.21 points on the original five-point scale.

Table 2. Weighted Mean Evaluations of Influence by Power and Attribution Type

Attribution Type	China	US	EU	US–China Gap
Consistent internaliser	0.686	0.622	0.636	−0.064
Sovereign adapter	0.666	0.617	0.623	−0.049
Consistent externaliser	0.687	0.603	0.621	−0.084
Inconsistent externaliser	0.706	0.647	0.658	−0.059

Note: Survey-weighted means, ratings rescaled to a 0–1 interval. All US–China gaps are significant at $p < 0.001$ (see Table 3).

The Conditional Penalty. Table 3 reports the interaction model. The US penalty for the reference group (internalisers) is −0.064 ($p < 0.001$). The penalty is significantly deeper among consistent externalisers, whose gap is 0.022 points larger ($p = 0.005$). This supports H2. Crucially, the penalty is significantly shallower among sovereign adapters, whose gap is 0.015 points smaller ($p = 0.035$). The weighted model resolves what was a marginal contrast in the unweighted model ($p = 0.080$). The inconsistent externalisers are statistically indistinguishable from internalisers (+0.009, $p = 0.480$). The theoretical prediction that they would fall "between" the groups is not supported as illustrated in Figure 1.

Table 3. US–China Gap by Attribution Type (Interaction Model)

Term	Weighted Estimate	SE	p	Unweighted Estimate	Unweighted p
US (vs. China), internaliser reference	−0.0641	0.0047	<0.001	−0.0574	<0.001
EU (vs. China), internaliser reference	−0.0500	0.0044	<0.001	−0.0470	<0.001
US × Sovereign adapter	+0.0149	0.0071	0.035	+0.0096	0.080
EU × Sovereign adapter	+0.0067	0.0072	0.352	+0.0070	0.205
US × Consistent externaliser	−0.0218	0.0078	0.005	−0.0266	<0.001
EU × Consistent externaliser	−0.0170	0.0076	0.026	−0.0164	0.006
US × Inconsistent externaliser	+0.0090	0.0127	0.480	−0.0013	0.905
EU × Inconsistent externaliser	+0.0031	0.0131	0.815	−0.0005	0.959

Note: Dependent variable is the 0–1 rescaled rating. All models include education, gender, age, urban residence, lived poverty, news-source count, and country fixed effects. Standard errors clustered at the respondent level (resp_id). Weighted estimates use Combinwt_new_hh. N = 74,022 respondent-power observations from 24,674 respondents.

Table 4 reports the covariate-adjusted marginal means from the same model. The adjusted gaps are marginally larger than the raw gaps (e.g., −0.086 vs −0.084 for consistent externalisers), reflecting slightly different covariate composition. The rank order is unchanged.

Table 4. Marginal Means of Power Ratings by Attribution Type (Weighted, Adjusted)

Attribution Type	China	US	EU	US–China Gap
Consistent internaliser	0.684	0.620	0.634	−0.064
Sovereign adapter	0.671	0.622	0.628	−0.049
Consistent externaliser	0.690	0.604	0.623	−0.086
Inconsistent externaliser	0.693	0.638	0.646	−0.055

Note: Marginal means from the model in Table 3, averaged over the weighted estimation sample (avg_predictions, marginaleffects). Standard errors clustered at the respondent level. All pairwise US–China gaps are significant at $p < 0.001$.

The Climate Awareness Comparison. Among non-aware respondents, the baseline US–China gap is −0.045 ($p < 0.001$). The interaction between the US rating and climate awareness is negative and highly significant ($b = −0.019$, $p < 0.001$). The total average penalty among climate-aware respondents is approximately −0.064, roughly 40% larger than the non-aware baseline.

We run the same test for the EU. The baseline EU–China gap among non-aware respondents is −0.052, but the interaction with climate awareness is not significant ($b = −0.0002$, $p = 0.97$). The EU gap is numerically identical among non-aware and climate-aware respondents. This is a crucial finding: climate awareness amplifies the US penalty but has no effect on the EU penalty (Table 5). Climate-aware citizens are discriminating between Western powers based on their climate records. Only a climate-cognition account predicts this asymmetry.

Table 5. Climate Awareness Comparison: US and EU Penalties (Weighted)

Variable	US Model	EU Model
Power Rating (Non-aware baseline)	−0.045*** (0.003)	−0.052*** (0.003)
Power × Climate-Aware	−0.019*** (0.004)	−0.0002 (0.004)
Climate-Aware (Main Effect on Reference Power, China)	+0.031*** (0.004)	+0.031*** (0.004)
Country Fixed Effects	Yes	Yes
Controls	Yes	Yes
N	40,063	40,063

Note: Survey-weighted estimates; standard errors clustered at the respondent level. *** $p < 0.001$. The non-aware baseline is the main effect of power; the climate-aware total is the sum of the main effect and the interaction. The identical "Climate-Aware" main effect in both columns reflects the effect of climate awareness on the reference power (China), which is mathematically identical across the two columns of the pooled model.

Does Attribution Type Add Explanatory Power? A nested model comparison confirms that adding attribution type significantly improves model fit ($F = 4.68$, $p < 0.001$, weighted), indicating the four-category framework captures a distinct cognitive structure.

Robustness Checks. First, the complete-case specification (N = 18,726) yields substantively identical results (US–China gap = −0.062; externaliser interaction = −0.021, $p = 0.021$). Second, the unweighted specification produces the identical substantive pattern, though the sovereign-adapter contrast is marginal ($p = 0.080$). Third, an alternative attribution recode shifts the distribution by less than 1 percentage point and leaves the interactions unchanged.

Climate literacy restriction

We re-estimate the principal models using a stricter climate-literacy criterion following Simpson et al. (2021): respondents who have heard of climate change and identify human activity as a cause (Q61A = 1 or 3). This reduces the sample from 24,674 to 20,043. The core results are stable: the externaliser interaction is −0.025 ($p = 0.003$; vs −0.022, $p = 0.005$), and the climate-awareness amplification is −0.018 ($p < 0.001$; vs −0.019, $p < 0.001$). The EU penalty remains unamplified in both specifications as illustrated in Figure 2. One contrast changes: the sovereign-adapter interaction falls from $p = 0.035$ to $p = 0.087$, suggesting the pragmatic-sovereignty position is partly concentrated among respondents with lower climate literacy. We note this as a scope condition rather than a threat to the main results.

6. Discussion

Our findings make three contributions. First, climate awareness is not a monolithic force; it disassembles public opinion into distinct frameworks. Second, these frameworks significantly structure

how citizens evaluate the US and China. Third, climate cognition amplifies the US penalty: a baseline penalty exists even among respondents who have never heard of climate change, but it is significantly larger among those who are climate-aware. Crucially, this amplification is US-specific.

The most theoretically interesting finding is the prominence of the sovereign adapter. Nearly three in ten climate-aware respondents (28.9%) blame foreign actors for causing climate change but insist on domestic solutions. This challenges a common assumption in the climate justice literature: that recognising external responsibility implies a demand for external intervention. Sovereign adapters acknowledge that the Global North bears historical responsibility, yet they do not expect the Global North to solve it. The weighted model sharpens this finding: sovereign adapters exhibit the shallowest US–China gap of any group (−0.049), and the interaction term is statistically significant ($p = 0.035$). The US loses less ground among sovereign adapters not because they are less critical of the US, but because they do not use international climate leadership as a criterion for evaluating global powers. It is a refusal to let acknowledged external blame generate a demand for external rescue.

The climate awareness comparison complicates the "climate pariah" thesis (Kemp, 2017). The US penalty exists even among respondents who have never heard of climate change (−0.045), suggesting part of the gap is driven by general geopolitical sentiment. But climate awareness significantly amplifies this penalty (−0.019, $p < 0.001$), raising it to approximately −0.064. The "pariah" effect is real, but it is mediated by cognitive disassembly. The US does not lose soft power uniformly; it loses it most among the climate-aware, and most of all among consistent externalisers. The amplification is real but more modest than initially reported: the climate-aware penalty (−0.064) is roughly 40% larger than the non-aware baseline (−0.045).

The EU null is the paper's sharpest evidence for discrimination. Climate-aware Africans do not penalise the EU despite its status as a Western power: the EU–China gap is −0.052 among both non-aware and climate-aware respondents ($p = 0.97$). The EU remained committed to the Paris Agreement and continued to fund climate initiatives. The US penalty is not generic anti-Western sentiment; it is a targeted response to perceived climate abdication. Soft power deficits are not simply a function of what a power does, but of how citizens interpret what it does.

One finding runs against our theoretical expectations. The inconsistent externalisers—who blame domestic actors but expect foreign remedies—were predicted to fall "between" the internalisers and consistent externalisers. They do not. Both weighted and unweighted models show them statistically indistinguishable from consistent internalisers ($p = 0.480$). On this outcome, the four-type typology collapses to a three-behavioural-type story: internalisers and inconsistent externalisers on one side, sovereign adapters in the middle, consistent externalisers at the extreme. The most plausible interpretation is that the remedy dimension, not the cause dimension, drives the geopolitical evaluation. Citizens who expect domestic remedies—whether they blame domestic or foreign actors for the cause—do not use international climate leadership as a criterion for evaluating great powers. The cause dimension structures what citizens believe about the problem; the remedy dimension structures what

they expect of great powers. This refines the mechanism and suggests future work should theorise the remedy dimension more carefully.

Three limitations deserve mention. First, our data are cross-sectional, limiting causal claims. We cannot rule out that an unobserved variable, such as general political engagement, drives both climate awareness and critical evaluations of the US. Second, our measure captures climate awareness, not full climate literacy (Simpson et al., 2021); we do not know whether respondents understand anthropogenic causes. Third, the US–China gap is modest in magnitude—equivalent to 0.12 to 0.21 points on a five-point scale. A fourth limitation is specific to the weighted specification: the Afrobarometer weights correct for unequal selection probabilities within countries but do not fully correct for differential non-response, and the weighted estimates should be read as representative of the surveyed population.

7. Conclusion

In a global climate regime fractured by the US retreat and animated by China's rise as a green power, African citizens are active interpreters of the climate crisis. This paper shows that climate awareness disassembles public opinion into four distinct attribution frameworks and that these frameworks significantly structure the US–China gap. The US penalty is universal in direction, conditional in magnitude, and significantly amplified by climate cognition. A placebo test shows that a baseline US penalty exists independently of climate cognition (−0.045), but climate awareness amplifies it by approximately 2 points on the 0–1 rescaled rating, bringing the total penalty to approximately −0.064. The amplification is US-specific: the EU penalty is unchanged by climate awareness.

The most interesting finding may not be that Africans rate China above the US. It is that nearly one in three climate-aware Africans blame foreign actors for causing climate change but insist on domestic solutions. This "sovereign adapter" position reflects a pragmatic sovereignty—an insistence on African agency even in the face of acknowledged external responsibility. For scholars of climate justice, this challenges the assumption that recognising external responsibility implies a demand for external intervention. For policymakers, it suggests that the soft power returns from climate leadership are real, but they are mediated by the cognitive frameworks of the citizens they seek to reach.

The policy implication is sharp. The US does not face a generic anti-Western penalty in Africa; it faces a climate-specific penalty concentrated among citizens who are most cognitively engaged with the issue. Re-engaging with the Paris Agreement and restoring climate finance would not neutralise the baseline penalty—which exists among respondents who have never heard of climate change—but it would narrow the amplification among climate-aware citizens. The EU's position demonstrates that this is possible: a Western power that maintains its climate commitments is not penalised for climate cognition. The question for Washington is whether the climate-specific component of its soft power deficit is one it wishes to continue paying.

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Figures

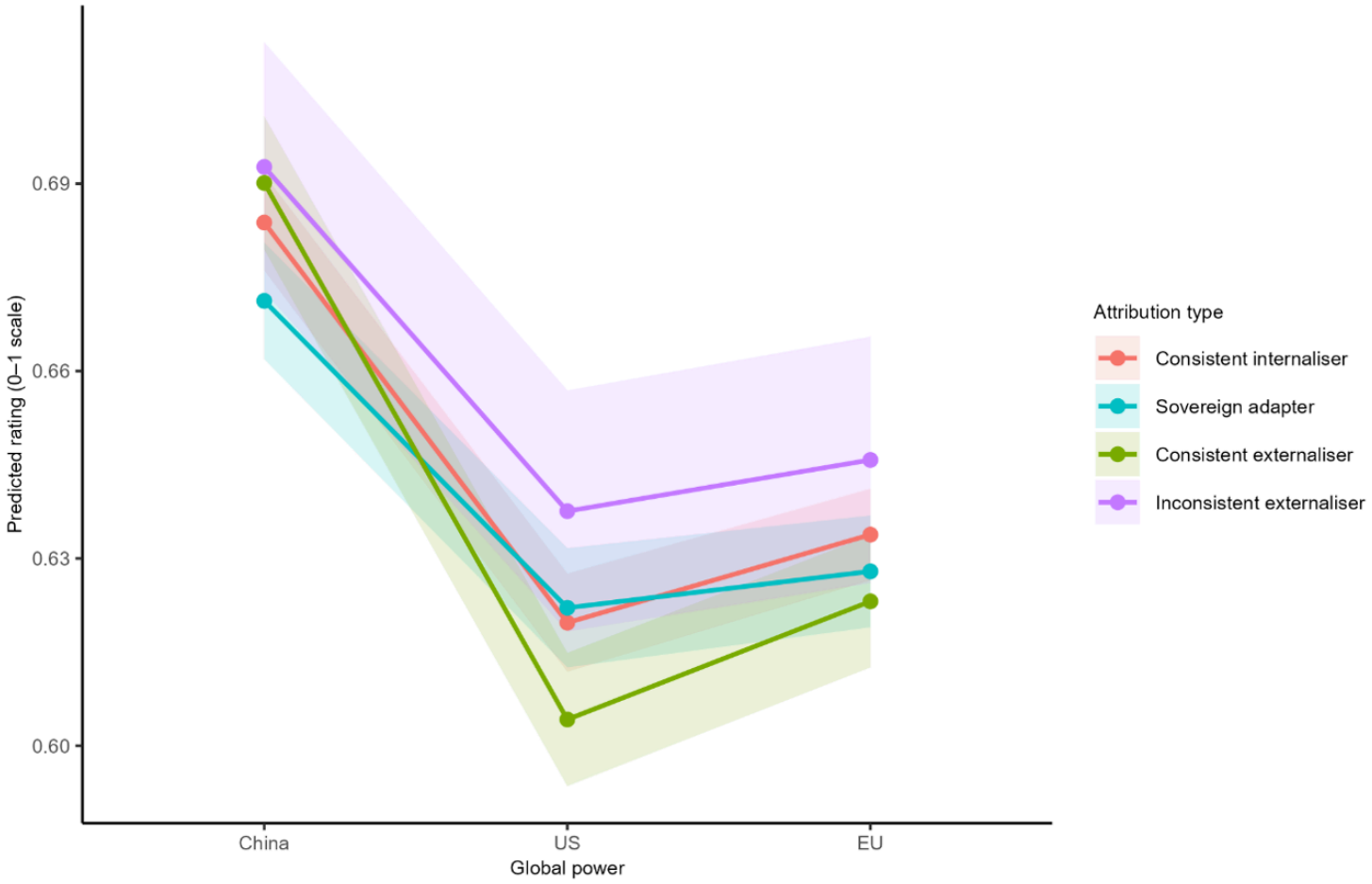


Figure 1

The US–China gap varies by attribution type

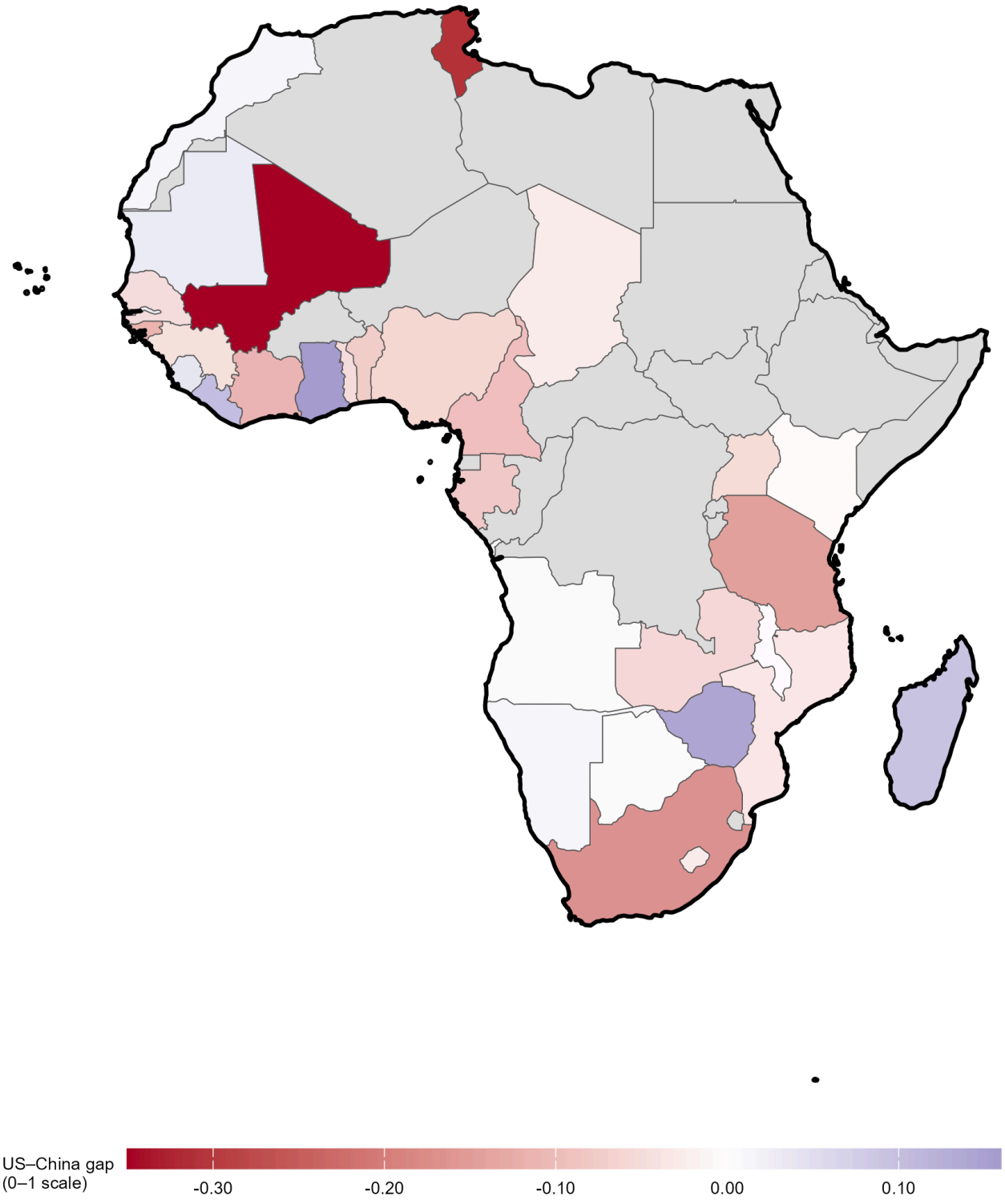


Figure 2

The geography of the US–China gap in Africa

Supplementary Files

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- SupplementaryInformationforAvengers.docx
- ABR10.MergeDataset25Feb26.38ctry.release.sav