

# Status from fighting? Reassessing the relationship between conflict involvement and diplomatic rank

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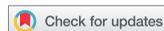
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## Status from fighting? Reassessing the relationship between conflict involvement and diplomatic rank

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### ABSTRACT

Recent research has provided evidence that conflict improves a belligerent's status. I argue that this finding is based on a specification error. The relationship between the CINC index, which is used to control for material capabilities as a potential confounder, and change in diplomatic rank is not linear. Accounting for this non-linearity eliminates the apparent positive effect of MID initiation on change in diplomatic rank, and also reduces the effect of MID victory. The analysis has significant implications for foreign policy, for ongoing debates over the most useful way to model the link between status dissatisfaction and belligerence, and, more broadly, for analyses that use CINC to control for material capabilities.

### KEYWORDS

Security; conflict; statistical methodology

## Introduction

Does militarized interstate conflict increase national status? This is a critical question for theory and policy. The answer has implications for how we model status dissatisfaction's influence on foreign policymaking. Moreover, if conflict is an effective means of increasing status, then leaders may be right to think that belligerence is a wise strategy for improving or defending a state's position in the world. If not, then leaders should not respond to concerns about national status by seeking out or escalating conflicts.

Recent research supports the former view. Jonathan Renshon (2016, 2017) argues that conflict improves a state's status in the world and shows that, on average, initiating a militarized interstate dispute improves a state's diplomatic "rank" (its ranking in terms of the number and importance of diplomats that it hosts). Winning a MID is also beneficial, though the estimated effect of victory contains substantially more uncertainty than that of initiation.

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1. Data replication files are available at <http://dvn.iq.harvard.edu/dvn/dv/internationalinteractions>. All inquiries related to replication should be directed to the author.

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Renshon's work on status is influential and highly regarded, but this finding is the artifact of a modeling error.<sup>1</sup> Renshon incorrectly treats the relationship between material capabilities (a potential confounder) and change in diplomatic rank as linear. Because the positive influence of capabilities on change in diplomatic rank is stronger for relatively weak than for relatively strong states, and because the positive association between conflict and change in diplomatic rank is also stronger among relatively weak states, imposing linearity on the former relationship results in an overestimate of the effect of conflict initiation on change in diplomatic rank. Correcting this error causes the positive effect of MID initiation to disappear, and weakens the already unreliable estimate of MID victory's effect on diplomatic rank.

In the next section, I situate Renshon's important finding in ongoing debates over status-seeking in international relations. I then show that the relationship between material capabilities and change in diplomatic rank is non-linear, that log-transforming the capabilities index substantially changes estimates of the effect of conflict on change in diplomatic rank, and that addressing non-linearity in more flexible ways yields similar results. I also show that these changes in the estimated effect of conflict on change in diplomatic rank are primarily the result of more accurately capturing the strong effect of capabilities on change in diplomatic rank among relatively weak actors. The note concludes by unpacking implications for how we theorize the influence of status-dissatisfaction on foreign policy, for how policymakers should think about conflict as a tool for redressing status anxiety, and for how analysts should think about the potential problems raised by using CINC as a proxy for material capabilities.

## Conflict and Status in World Politics

Analysts have long thought that states dissatisfied with their status are more conflict-prone. This was one of the first findings from the behavioral study of interstate conflict (East 1972; Gochman 1980; Midlarsky 1975; Wallace 1971, 1973). Status refers to a state's position in a social hierarchy. More concretely, a state's status is equivalent to the sum of the beliefs of relevant others about how important it is relative to other states. Status is hard to measure, but analysts typically do so by using data on diplomatic exchange. Sending and maintaining diplomats abroad is costly; diplomatic exchange is thus constrained by subjective assessments of relative importance. States that host larger numbers of diplomats are thus collectively considered more important than states with smaller diplomatic contingents. Scholars have built on this insight to develop measures of status inconsistency – states hosting fewer

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<sup>1</sup>*Fighting for Status* – whose argument relies on the finding examined here – won the International Studies Association's 2019 Best Book Award and Georgetown University's 2017 Lepgold Book Prize.

diplomats than they should on the basis of their material capabilities are undervalued. Undervaluation has, in turn, been shown to drive belligerence.

Renshon's recent research confirms that status dissatisfaction understood in this manner is associated with a higher likelihood of conflict initiation. One of his most distinctive contributions is to argue and provide evidence that the link between status dissatisfaction and conflict initiation is instrumental and strategically intelligible (Renshon 2016, 520–521, 526). This is a controversial claim. There is little agreement about why states dissatisfied with their status are belligerent. Some authors argue that the explanation involves social psychology, emotions, or pathological domestic political processes that favor aggressive policies when status concerns are salient (Barnhart 2016; Larson and Shevchenko 2010; Ward 2017).<sup>2</sup> Belligerence linked to status dissatisfaction is thus best modeled as a common mistake that leaders make. Mercer (2017) similarly argues that status itself is illusory, which implies that policies motivated by concerns for improving status are misguided.

By contrast, Renshon (2016) rejects as “weak” mechanisms based on emotions like frustration, and instead argues that states dissatisfied with their status behave belligerently because they correctly believe that belligerence is an effective means of improving status. This is because (1) improving status requires public demonstrations that the state possesses admirable characteristics; (2) military capacity is an admirable characteristic in international politics; and (3) conflict initiation constitutes a public demonstration of military capacity.<sup>3</sup>

Renshon substantiates this claim by showing that states initiating a militarized interstate dispute improve their diplomatic rank by, on average, 1.4 positions after 5 years and 2.7 positions after 10 years compared to non-initiators (see Table 1).

Victory also appears to improve diplomatic rank, but there is greater uncertainty about its long-term effect (see Table 2). If Renshon is right, leaders determined to improve their states' status may be correct to seek conflict – whether or not they expect to prevail. The initiation of a MID sends a public

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<sup>2</sup>There is an important distinction between arguments that link status dissatisfaction to conflict via domestic political pathologies and arguments that see status-seeking (in the form of conflict initiation) as an effective means of resolving domestic political problems (for instance, inadequate levels of identification with the state – see Sambanis, Skaperdas, and Wohlforth 2015). The latter arguments imply that conflict should improve national status, which should in turn help to strengthen the regime's domestic political position (and perhaps generally strengthen the state as well). The former arguments imply, by contrast, that status dissatisfaction may lead to conflict (as a result, for instance, of domestic pressures on leaders who would prefer not to fight), but that conflict should not necessarily result in higher status.

<sup>3</sup>Note that this argument is similar to arguments about leaders resorting to conflict as a way of seeking national status in order to bolster their domestic political positions. The only difference is the ultimate source of status concerns: do leaders themselves care about improving national status (either because status is instrumentally useful or because status is intrinsically valuable), or do leaders care about improving national status because they anticipate that doing so will have salutary consequences for the state's domestic politics? Importantly, both of these arguments imply that public demonstrations of military capacity should, on average, improve the state's status in the world.

**Table 1.** MID initiation and change in diplomatic rank.

| <i>DV: Change in diplomatic rank<br/>(five and ten years post conflict)</i> | Five years               |                           | Ten years                 |                            |
|---|--------------------------|---------------------------|---------------------------|----------------------------|
|   | Bivariate                | Full                      | Bivariate                 | Full                       |
| <b>MID initiation</b>   | <b>0.697*</b><br>(0.300) | <b>1.382**</b><br>(0.520) | <b>1.163**</b><br>(0.434) | <b>2.703***</b><br>(0.782) |
| Polity  |                          | -0.00493<br>(0.0283)      |                           | 0.0723<br>(0.0423)         |
| CINC score  |                          | 27.18*<br>(11.76)         |                           | 53.63**<br>(17.18)         |
| Prior diplomatic rank   |                          | 0.0448***<br>(0.00516)    |                           | 0.0859***<br>(0.00818)     |
| Middle East   |                          | 2.679***<br>(0.722)       |                           | 5.872***<br>(1.090)        |
| Africa  |                          | -0.498<br>(0.676)         |                           | -1.392<br>(1.055)          |
| Asia  |                          | 2.572***<br>(0.647)       |                           | 4.687***<br>(0.998)        |
| N. and S. America   |                          | -1.215*<br>(0.595)        |                           | -2.110*<br>(0.906)         |
| Major power   |                          | 0.190<br>(1.262)          |                           | 0.335<br>(1.892)           |
| GDP per capita  |                          | 0.000163***<br>(2.58e-05) |                           | 0.000331***<br>(4.30e-05)  |
| Constant  | -1.092***<br>(0.108)     | -6.297***<br>(0.610)      | -2.598***<br>(0.156)      | -12.63***<br>(0.921)       |
| Observations  | 11,835                   | 5,362                     | 10,758                    | 4,583                      |
| R-squared   | 0.000                    | 0.035                     | 0.001                     | 0.065                      |

Standard errors in parentheses.

\*\*\*p < .001, \*\*p < .01, \*p < .05.

Table 1 shows full results for the four OLS regression models that yield the coefficients plotted in the left-most segment of Figure 2 in Renshon (2016).

signal of military capacity, which in turn results in a measurable improvement in the belligerent's diplomatic rank. This constitutes a powerful reason to accept the view that states dissatisfied with their status are sensible (rather than tragically mistaken) to think that fighting will force other actors to properly acknowledge their importance and treat them with greater deference. In short, this evidence suggests that the best way of modeling the link between status dissatisfaction and belligerence involves strategic calculation, rather than emotion, social psychological dynamics, or domestic political pathologies.

### Capabilities, Conflict, and Diplomatic Rank

One of the most important potential confounders that Renshon's analyses control for is material capabilities. Variation in material power – operationalized using the Correlates of War index of National Material Capabilities (Singer 1988) – could account for any association between conflict initiation and change in status. Renshon's results importantly show that the association between conflict and status is not confounded by material power.

**Table 2.** MID victory and change in diplomatic rank.

| <i>DV: Change in diplomatic rank<br/>(five and ten years post conflict)</i> | Five years                |                            | Ten years                 |                           |
|---|---------------------------|----------------------------|---------------------------|---------------------------|
|   | Bivariate                 | Full                       | Bivariate                 | Full                      |
| <b>MID victory</b>  | <b>2.063**</b><br>(0.695) | <b>6.047***</b><br>(1.819) | <b>2.688**</b><br>(0.972) | <b>3.616</b><br>(2.683)   |
| Polity  |                           | -0.0306<br>(0.0299)        |                           | 0.0428<br>(0.0442)        |
| CINC score  |                           | 30.68*<br>(14.31)          |                           | 67.59**<br>(20.64)        |
| Prior diplomatic rank   |                           | 0.0364***<br>(0.00540)     |                           | 0.0665***<br>(0.00843)    |
| Middle East   |                           | 2.274**<br>(0.782)         |                           | 5.120***<br>(1.166)       |
| Africa  |                           | 0.00916<br>(0.703)         |                           | -0.963<br>(1.075)         |
| Asia  |                           | 3.379***<br>(0.673)        |                           | 5.597***<br>(1.019)       |
| N. and S. America   |                           | -0.887<br>(0.619)          |                           | -1.589<br>(0.925)         |
| Major power   |                           | -0.215<br>(1.435)          |                           | -0.514<br>(2.099)         |
| GDP per capita  |                           | 0.000179***<br>(2.72e-05)  |                           | 0.000327***<br>(4.42e-05) |
| Constant  | -1.092***<br>(0.106)      | -6.138***<br>(0.634)       | -2.598***<br>(0.152)      | -11.68***<br>(0.944)      |
| Observations  | 10,559                    | 4,653                      | 9,597                     | 3,976                     |
| R-squared   | 0.001                     | 0.036                      | 0.001                     | 0.060                     |

Standard errors in parentheses.

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

Table 2 shows full results for the four OLS regression models that yield the coefficients plotted in the “Initiating and winning relative to not initiating” segment of Figure 2 in Renshon (2016).

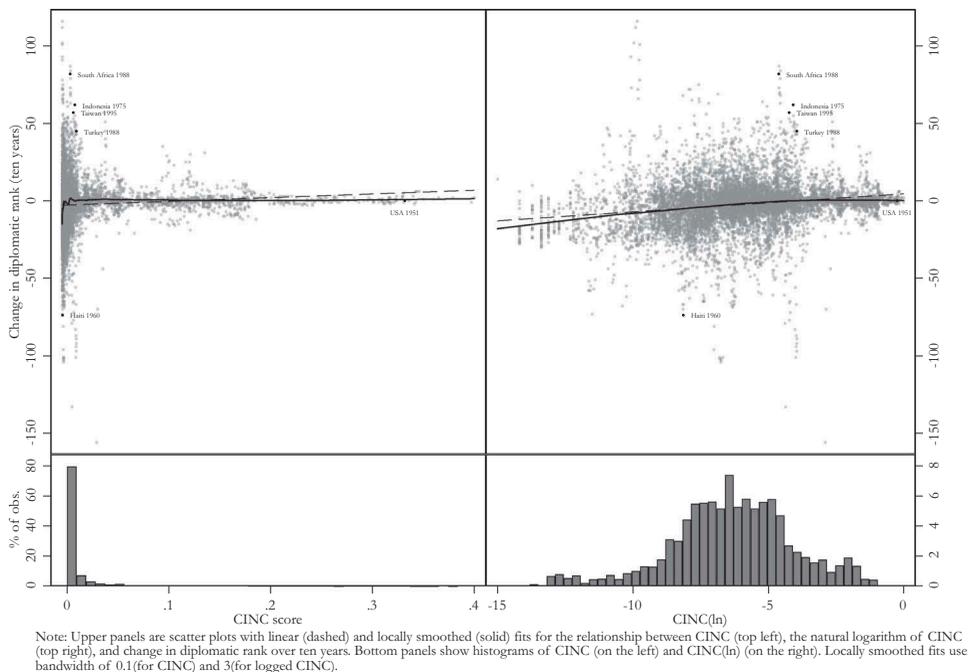
But the relationship between the CINC index and change in diplomatic rank is modeled incorrectly. The CINC index ranges from 0 to 1 and reports the proportion of the system’s total capabilities that an actor controls (where capabilities are measured by equally weighting a state’s relative endowment along six concrete indicators: military spending, military personnel, total population, urban population, iron and steel production, and energy consumption). In practice, the highest observed value of the variable is .38, implying that the most powerful actor in the modern international system (the United States in 1945) controlled roughly 38% of the system’s material capabilities.

Renshon’s multivariate models use the raw CINC index to control for material capabilities. This decision raises two important methodological problems. The first – which has often been cited by users of the index – is that CINC is badly right-skewed. Prominent scholarship has frequently log-transformed the variable to more closely approximate a normal distribution (see, e.g., Barbieri 1996; Carroll and Kenkel 2019; Daxecker 2007; Gartzke 2007; Hegre 2008; Lyall and Wilson 2009; Mousseau 2000; Salehyan 2008; Uzonyi 2015).

The second problem is more serious. Using the raw CINC index as a control variable in an OLS regression model imposes linearity on the relationship between CINC and the dependent variable. But there are theoretical reasons to think that the relationship between CINC and change in diplomatic rank might vary across the CINC distribution. In particular, differences in material capabilities likely matter more for changes in diplomatic rank among relatively weak states than they do among relatively strong states. This is because the top of the CINC distribution is occupied by very powerful states with global reach and influence, who are equally attractive as targets for diplomatic exchange regardless of differences in the proportion of the system's capabilities that they control.

The bottom of the CINC distribution, on the other hand, is occupied by states without global reach or influence, whose attractiveness as targets for diplomatic exchange should vary more widely. There might, in other words, be a group of dominant states (like the United States, France, China, the United Kingdom, and Germany today) near the top of the CINC distribution whose global influence makes it equally important for other actors to be represented in their capitals, regardless of the fact that they control different amounts of material power. Farther down the CINC distribution, we should see greater variation in the size of diplomatic portfolios in the capitals of small and medium powers, and evidence that similar-sized differences in material power matter more here than they do closer to the top of the distribution. Renshon (2017, 161) himself even implies that this is a plausible interpretation when he suggests that the relationship between conflict and status is characterized by “ceiling effects” that attenuate that association among very powerful states whose diplomatic portfolios are approaching their maximum possible size. Imposing a single slope across the CINC distribution might thus underestimate the relationship between capabilities and change in diplomatic rank for relatively weak states.

The left-hand panels of [Figure 1](#) illustrate these problems. The panel in the lower left-hand corner of the figure shows a histogram of CINC. The index is clearly right-skewed, with the vast majority of observations concentrated below .05. The panel in the upper left-hand corner of the figure represents a scatter plot depicting the relationship between CINC (on the x-axis) and change in diplomatic rank over 10 years (on the y-axis). The dashed line represents the slope from a bivariate OLS regression; the solid line represents a local regression – a non-parametric estimation method that allows the slope of the relationship to vary across the range of the predictor (Royston 1991). The linear and local predictions clearly diverge. For one thing, the linear fit overestimates the relationship between capabilities and change in diplomatic rank among very powerful states. These cases have high leverage (due to their extremity from the bulk of the observations), and thus collectively exert



**Figure 1.** Non-linearity in the relationship between CINC and change in diplomatic rank.

strong downward pressure on the linear prediction.<sup>4</sup> More importantly – and partially by consequence – the linear prediction diverges significantly from the local prediction among states near the bottom of the CINC distribution. The local fit implies that the relationship between CINC and change in diplomatic rank is steeply positive among the weakest states, and then sharply levels off. Imposing a constant slope on the relationship between CINC and change in diplomatic rank indeed appears to seriously underestimate the importance of relatively small differences in material power on change in diplomatic rank among states near the bottom of the CINC distribution, where most of the observations are found.

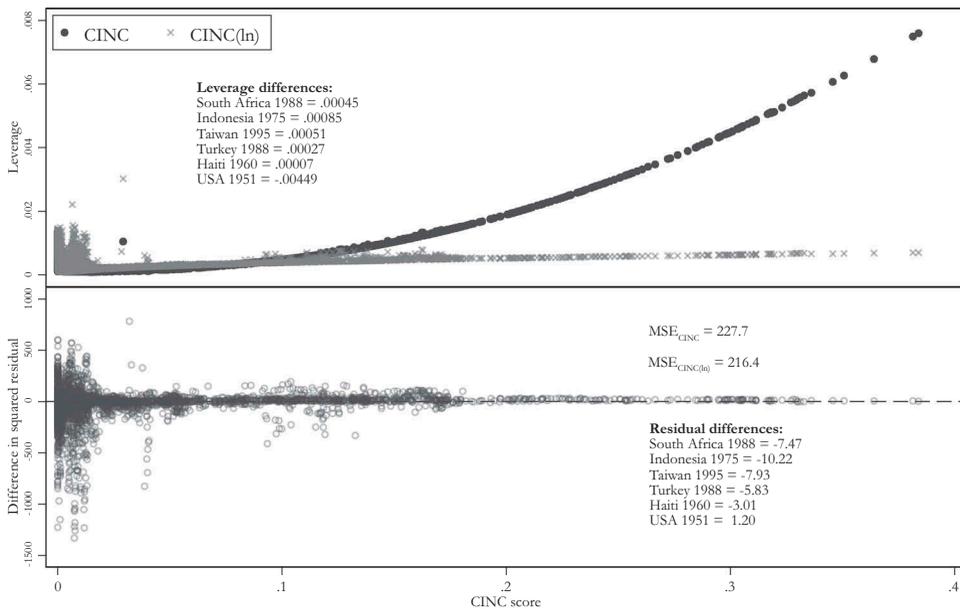
The right-hand panels of [Figure 1](#) show that log-transforming the CINC index does much to address *both* of these problems. The bottom right-hand panel displays a histogram of the log-transformed version of CINC, which more closely approximates a normal distribution. The top right-hand panel plots the relationship between the natural logarithm of CINC (on the x-axis) and change in diplomatic rank over 10 years (on the y-axis). Local (solid) and linear (dashed) fits are also displayed. The linear and local fits look more similar here than they do in the left-hand panel – importantly, they overlap

<sup>4</sup>Leverage is a measure of an observation's distance in terms of its value for the predictor variable from the mean of that variable, adjusting for sample size and variance (Belsley, Kuh, and Welsch 1980). Observations with higher leverage have the potential to more strongly affect an estimate of the relationship between the predictor and an outcome variable (Fox 1991, 22–40).

across the bulk of the observations, and diverge slightly only for the relatively small number of extreme cases at the very top and bottom of the distribution of log-transformed CINC.<sup>5</sup>

To illustrate the significance of the log transformation, Figure 1 highlights the positions of six observations: South Africa in 1980, Indonesia in 1975, Taiwan in 1995, Turkey in 1988, Haiti in 1960, and the United States in 1951. In the upper left-hand panel, South Africa, Indonesia, Taiwan, Turkey, and Haiti are clumped near the bottom of the CINC distribution. Differences among them are insignificant relative to their common distance from the United States, located near the top of the CINC distribution. Log-transforming the CINC index extends the variable's scale near the bottom of the distribution and shrinks its scale near the top. This magnifies the importance of the differences in capabilities between very weak states like Haiti, on one hand, and slightly stronger states like Turkey, Taiwan, South Africa, and Indonesia on the other. At the same time, it diminishes the importance of the difference between these moderately weak states and those, like the United States, near the top of the CINC distribution.

Figure 2 shows more formally how log-transforming the CINC variable changes the bivariate relationship between capabilities and diplomatic



Note: Upper panel's y-axis reports each observation's leverage in bivariate models using CINC and CINC(ln) to predict change in diplomatic rank over ten years. The lower panel's y-axis reports the differences in the squared residual for each observation when CINC(ln) is used to predict change in diplomatic rank over ten years, versus when CINC is used. Negative (positive) values along this axis mean that the squared residual decreases (increases) when CINC is log-transformed. Both values are plotted against CINC score on the x-axis. A reference line at  $y=0$  is included in the lower panel, as are changes in the size of residuals and leverage values for the six observations highlighted in Figure 1. The lower panel also reports the mean squared error from the CINC model and CINC(ln) model.

**Figure 2.** Leverage and change in squared residuals with CINC and log-transformed CINC.

<sup>5</sup>Figure 1A in the appendix repeats this analysis for the relationship between CINC and change in diplomatic rank over 5 years.

exchange. The top panel compares the leverage of individual observations when we use the raw and log-transformed versions of CINC to predict change in diplomatic rank. The log transformation dramatically reduces the leverage of powerful states and slightly increases the leverage of weaker states. This should improve fit by allowing weaker cases – which constitute the bulk of the observations – to more strongly affect the linear prediction, and by reducing the downward pressure that a handful of powerful, extreme cases exert on the overall relationship.

The bottom panel demonstrates this improvement in fit by comparing the squared residuals that result when we use CINC to predict the change in diplomatic rank with those that result when we use the log-transformed variable, and plotting these differences against CINC. The mean-squared error is smaller when CINC is log-transformed, and the largest improvements in fit come from the bottom of the CINC distribution. The log transformation does indeed improve our ability to accurately predict the change in diplomatic rank, most dramatically among relatively weak states.<sup>6</sup>

Figure 2 also displays changes in the absolute value of residuals as well as leverage for the six observations highlighted in Figure 1. In the four moderately weak cases – South Africa, Indonesia, Turkey, and Taiwan – the log-transformation reduces residuals while increasing leverage. For Haiti (a very weak case), the log-transformation has a similar effect, though the changes are smaller in magnitude. For the United States (a very strong case), the residual actually increases very slightly, while leverage declines significantly.

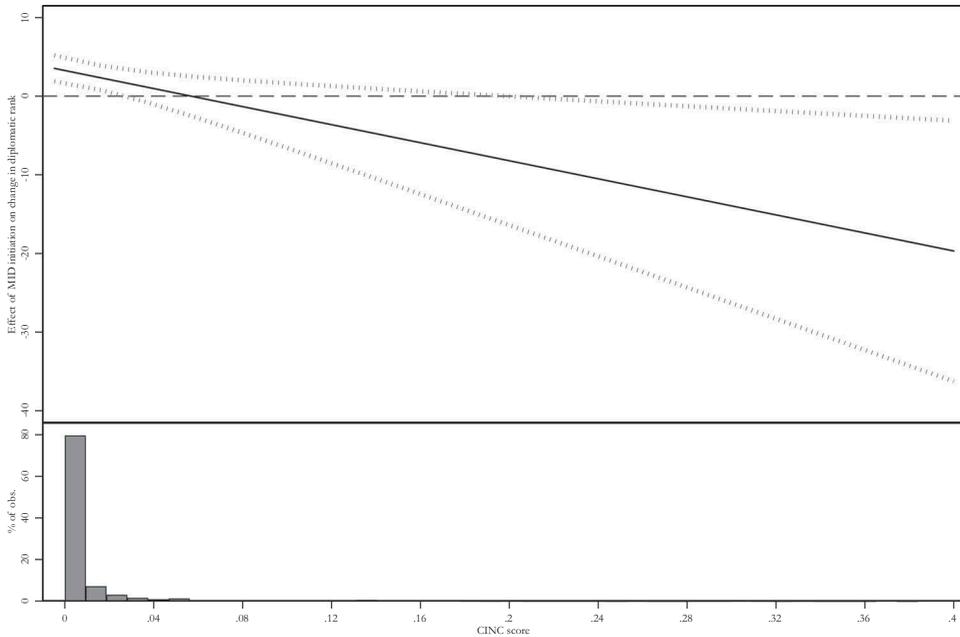
Mismodeling the relationship between CINC and change in diplomatic rank only matters in this context if doing so contributes to inaccurate estimates of the relationship between *conflict* and change in diplomatic rank. There are good reasons to suspect that this is the case. Figure 3 shows how the marginal effect of MID initiation on change in diplomatic rank varies across the CINC distribution. Importantly, the only cases for which the relationship is positive are near the bottom of the CINC distribution – only for relatively weak states is there a strong association between initiating a militarized interstate dispute and experiencing a subsequent improvement in diplomatic status.<sup>7</sup>

These are the *same* cases in which the effect of differences in capabilities on changes in diplomatic rank has been badly underestimated in the linear model. What appears to be a positive relationship between conflict and improved diplomatic rank might thus only emerge because the effect of capabilities has not been accounted for adequately. Failing to address non-linearity in the relationship between CINC and change in diplomatic rank

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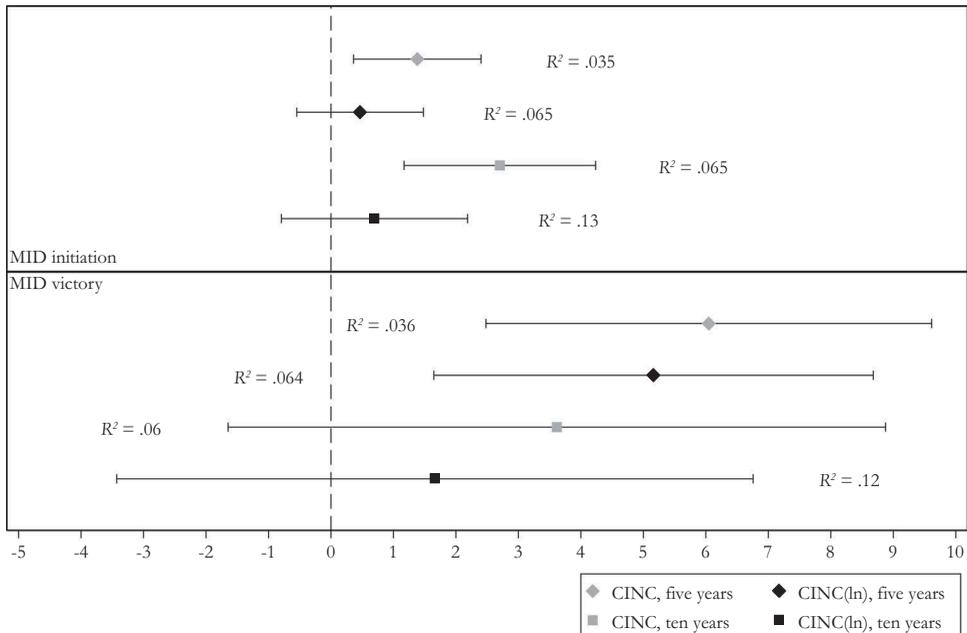
<sup>6</sup>Figure 2A in the appendix shows that this is true as well of the difference between predicting change in diplomatic rank over 5 years using CINC and the log-transformed version of CINC.

<sup>7</sup>Figures 3A, 4A, and 5A in the appendix show that this is also the case for the effect of MID initiation on change in diplomatic rank over 5 years, and for the effect of MID victory on change in diplomatic rank over 5 and 10 years.



Note: Upper panel shows the marginal effect of MID initiation (as well as the 95% confidence interval) on change in diplomatic rank after ten years, across various levels of CINC. Estimates come from a model that replicates the 'full' model in the right-hand column of Table 1, but with an interaction term between CINC and MID initiation ( $b = -61.1, p = .008$ ). Bottom panel shows a histogram of CINC.

Figure 3. Marginal effect of MID initiation on change in diplomatic rank, by CINC.



Note: Top panel displays coefficients for MID initiation from four multivariate OLS regression models, with results from models replacing CINC with CINC(ln) in black. Bottom panel displays coefficients on MID victory from models specified in the same manner. Coefficients in gray replicate results from Renshon's fully specified models from Tables 1 and 2. Bars represent 95% confidence intervals. R-squared for each model reported to compare goodness of fit.

Figure 4. Comparing conflict coefficients in models with CINC and CINC(ln).

produces a form of omitted variable bias that may result in misleading estimates of the relationship between conflict and change in diplomatic rank.

Figure 4 confirms these suspicions. The top panel displays the coefficient for MID initiation from four different models: Renshon's fully specified 5-year and 10-year models (in gray) and two models (in black) that are identical with the exception that the CINC variable is replaced with the log-transformed version.

For both time intervals, log-transforming the CINC index causes the coefficient on MID initiation to shrink (from 1.4 to 0.47 over 5 years; from 2.7 to 0.7 over 10) and become statistically indistinguishable from zero. The reported R-squared statistics also show that the models with the log-transformed version of the CINC variable fit the data substantially better than those with the raw version of the CINC variable.

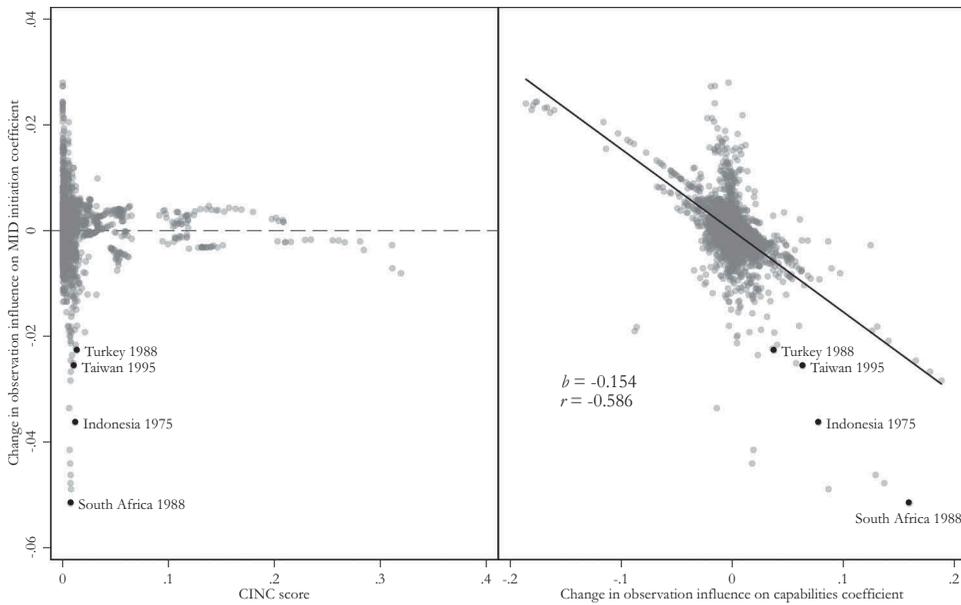
The bottom panel repeats this analysis for the relationship between MID victory and change in diplomatic rank. Again, replacing the raw version of CINC with the log-transformed version of CINC improves fit and reduces the estimated effect of victory on status change. The effect remains positive and significant after 5 years, but is halved after 10. As Renshon rightly notes, it is not obvious what we can infer from this result: there is substantial uncertainty involved in coding MID victory and defeat, and the assessment of outcomes does not reflect expectations, which should matter for subsequent adjustments of a belligerent's status.<sup>8</sup>

This is why Renshon (2016) highlights the association between initiation and improved status as solid evidence that conflict yields status: initiating a MID is a more reliable public signal of military capacity than being coded as having won. There should thus be a more reliable association between initiation and diplomatic rank than between victory and diplomatic rank. But the analysis here suggests that there is not a positive relationship between MID initiation and change in diplomatic rank – or evidence that conflict (no matter the outcome) improves status in the long term – after all.

Figure 5 confirms that the MID initiation coefficient shrinks because the log-transformation increases the importance of differences in capabilities for predicting change in diplomatic rank among relatively weak cases. The panel on the left plots the difference in each individual observation's influence on the MID initiation coefficient between the CINC and CINC(ln) models, against the CINC score.<sup>9</sup> The graph makes clear that the observations whose influence on the coefficient is reduced *most* are concentrated toward the lower end of the CINC distribution. The panel on the right plots the same value against the change in each observation's influence on the capabilities

<sup>8</sup>All of the coefficient differences depicted in Figure 4 are statistically distinguishable from zero, according to the results of Wald tests based on seemingly unrelated estimation using the method described in Clogg, Petkova, and Haritou (1995). See Table 1A in the appendix.

<sup>9</sup>An observation *i*'s influence is calculated as the regression coefficient for a particular predictor, minus the regression coefficient for the same predictor when *i* is excluded, divided by the standard error of the coefficient with *i* excluded.



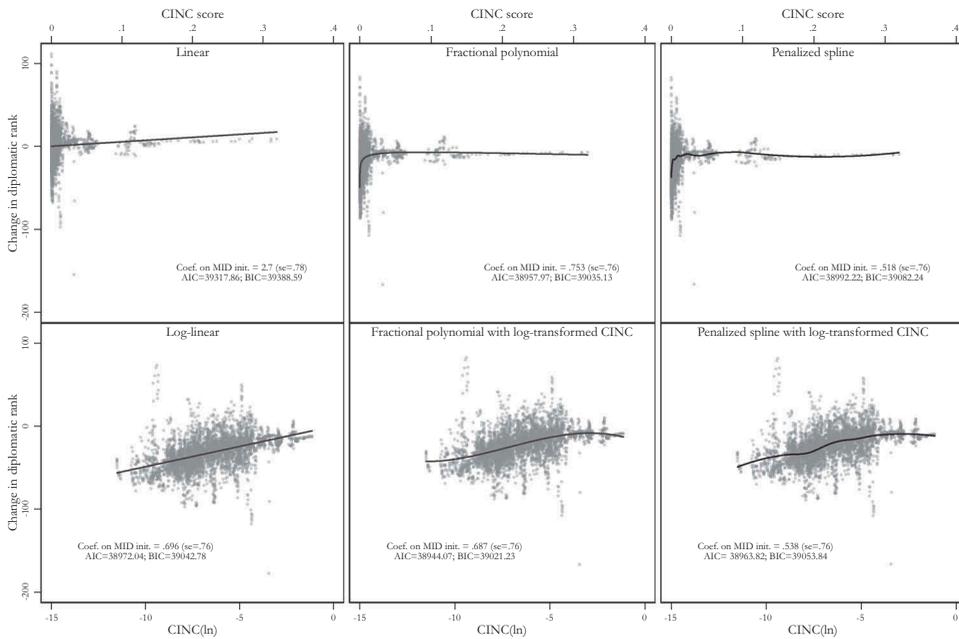
Note: The y-axis plots the difference between each observation's influence on the ten-year MID initiation coefficient as estimated in the model containing CINC(ln) and the model containing the raw version of CINC. Negative values indicate that the observation's positive influence on the coefficient shrinks in the CINC(ln) model as compared to the CINC model. The panel on the left plots this value against each observation's CINC score, and includes a reference line at  $y=0$ . The panel on the right plots the same value against the difference in each observation's influence on the capabilities coefficient between CINC and CINC(ln) models. Positive values indicate that the observation's positive influence on the capabilities coefficient is larger in the CINC(ln) model than in the CINC model. Solid line represents a linear fit.

**Figure 5.** Differences in influence between models with CINC and CINC(ln).

coefficient. The negative relationship between these two values shows that observations whose influence on the MID initiation coefficient *weakens* tend to *gain* influence on the capabilities coefficient.<sup>10</sup> Figure 5 also shows the four moderately weak cases highlighted in Figure 1 – South Africa, Indonesia, Turkey, and Taiwan – to better illustrate these changes. These cases – each of which initiated an MID in the observation year – contribute more negatively to the MID initiation coefficient and more positively to the capabilities coefficient in the log-linear model than in the linear model. The log-linear approach does a better job of modeling the relationship between capabilities and change in diplomatic rank, and this better fit reduces the apparent importance of MID initiation for predicting change in diplomatic rank among these and other relatively weak cases.

Of course, transforming the predictor is not the only or necessarily the best means of accounting for the possibility that the relationship between a predictor and outcome variable might vary across the distribution of the predictor. In this case, though, more flexible approaches yield substantively similar results. Figure 6 shows component plus partial residual plots for the relationship between capabilities and change in diplomatic rank over 10 years from six different models. Each

<sup>10</sup>Figures 6A, 7A, and 8A in the appendix repeat this analysis of changes in influence on the coefficients for MID initiation over 5 years, and for MID victory over 5 and 10 years.



Note: Graphs above depict the predicted values of change in diplomatic rank over ten years across different values of CINC, along with partial residuals, from six multivariate regression models. The linear graph is a component plus residual plot from Renshon's fully specified ten-year MID initiation model. The log-linear graph is a component plus residual plot from the same model, but with the log-transformed version of CINC replacing the raw version in the graph on the bottom. Graphs in the center column show component plus residual plots from fractional polynomial models (with the log-transformed version of CINC replacing the raw version in the graph on the bottom). Graphs in the right-hand column are component plus residual plots from penalized spline models, with the bottom graph again including the log-transformed version of CINC. Estimated coefficients for MID initiation from each model are also displayed. I also report the Akaike and Bayesian Information Criteria as measures of goodness of fit.

**Figure 6.** Modeling non-linearity in the CINC-diplomatic rank relationship.

plot also reports the regression coefficient on MID initiation as estimated in the corresponding model, as well as the Aikake and Bayesian Information Criteria in order to compare the goodness of fit.

The two plots in the left-hand panels are from the linear (top) and log-linear (bottom) models described above. The two plots in the center panels are from fractional polynomial models (Royston and Altman 1994; Royston and Ambler 1999) that include the raw CINC score (top) and the log-transformed CINC score (bottom). These approaches use a selection algorithm to choose the most appropriate parameters with which to model the relationship between the capabilities variable and the outcome. The two plots in the right-hand panels are from penalized spline models (Jann and Gutierrez 2008; Ruppert, Wand, and Carroll 2003) that include the raw CINC score (top) and the log-transformed CINC score (bottom). These approaches fit a series of polynomials connected at “knots” along the distribution of the capabilities variable in order to accommodate changes in the nature of its relationship with the outcome.

There are three points to note about these results. First, the component plots in the upper center and right-hand panels (from fractional polynomial and penalized spline models that include the raw version of CINC) diverge from the plot in the upper left-hand panel (from the linear model) in a prominent and familiar manner. Like the bivariate local regression fit from Figure 1, the

**Table 3.** Conflict coefficients from six approaches to modeling the role of CINC.

|                              | Linear          | Linear<br>(ln CINC) | Fractional<br>polynomial | Frac. poly.<br>(ln CINC) | P-spline       | P-spline<br>(ln CINC) |
|------------------------------|-----------------|---------------------|--------------------------|--------------------------|----------------|-----------------------|
| <b>Initiation (5 years)</b>  | <b>1.382**</b>  | <b>0.466</b>        | <b>0.480</b>             | <b>0.443</b>             | <b>0.369</b>   | <b>0.386</b>          |
|                              | (0.520)         | (0.517)             | (0.516)                  | (0.516)                  | (0.517)        | (0.516)               |
| AIC                          | 42551.6         | 42381.6             | 42375.5                  | 42365.9                  | 42424.8        | 42404.4               |
| BIC                          | 42624.0         | 42454.0             | 42454.6                  | 42445.0                  | 42517.0        | 42496.7               |
| <b>Initiation (10 years)</b> | <b>2.703***</b> | <b>0.696</b>        | <b>0.753</b>             | <b>0.687</b>             | <b>0.518</b>   | <b>0.538</b>          |
|                              | (0.782)         | (0.760)             | (0.758)                  | (0.757)                  | (0.759)        | (0.756)               |
| AIC                          | 39317.9         | 38972.0             | 38958.0                  | 38944.1                  | 38992.2        | 38963.8               |
| BIC                          | 39388.6         | 39042.8             | 39035.1                  | 39021.2                  | 39082.2        | 39053.8               |
| <b>Victory (5 years)</b>     | <b>6.047***</b> | <b>5.163**</b>      | <b>5.000**</b>           | <b>4.845**</b>           | <b>4.794**</b> | <b>4.925**</b>        |
|                              | (1.819)         | (1.794)             | (1.794)                  | (1.792)                  | (1.791)        | (1.791)               |
| AIC                          | 36727.7         | 36591.9             | 36588.0                  | 36576.8                  | 36616.8        | 36614.3               |
| BIC                          | 36798.6         | 36662.8             | 36665.3                  | 36654.1                  | 36707.0        | 36704.6               |
| <b>Victory (10 years)</b>    | <b>3.616</b>    | <b>1.663</b>        | <b>1.346</b>             | <b>1.018</b>             | <b>1.156</b>   | <b>1.179</b>          |
|                              | (2.683)         | (2.597)             | (2.597)                  | (2.593)                  | (2.589)        | (2.585)               |
| AIC                          | 33837.6         | 33573.9             | 33566.6                  | 33554.8                  | 33586.1        | 33575.3               |
| BIC                          | 33906.7         | 33643.1             | 33642.1                  | 33630.2                  | 33674.2        | 33663.3               |

Standard errors in parentheses.

The Aikake and Bayesian Information Criteria are reported for each model as measures of goodness of fit.

\*\*\*p < .001, \*\*p < .01, \*p < .05.

fractional polynomial and spline model plots depict a relationship between CINC and change in diplomatic rank that is steeply positive near the bottom of the CINC distribution, but then levels off and becomes nearly flat. The plot from the linear model in the upper left-hand panel looks quite different, as it depicts a constant slope across the CINC distribution. By contrast, the component plot from the log-linear model (in the lower left-hand panel) looks like a more reasonable approximation of the corresponding relationships estimated by the fractional polynomial (lower center panel) and spline (lower right-hand panel) models. This implies that the log transformation does a fairly good job of accounting for the non-linearity in the relationship between CINC and change in diplomatic rank, and that using additional tools to address remaining non-linearity does relatively little to improve on the log-linear model.<sup>11</sup>

Second, every model that accounts for non-linearity in some manner fits the data better than the linear model. The AIC and BIC from the linear model are by far the largest reported in the figure. The differences in goodness of fit among the other five models are much smaller than are the differences in goodness of fit between these and the linear model.

Third, estimates of the effect of conflict on change in diplomatic rank from the four models in the center and right-hand panels are substantively similar to estimates from the log-linear model. The MID initiation coefficient from the log-linear model is .696 (versus 2.7 from the linear model); the other four models that accommodate non-linearity produce

<sup>11</sup>Figures 9A, 10A, and 11A in the appendix repeat these analyses for models estimating the effect of MID initiation on change in diplomatic rank over 5 years, and MID victory over 5 and 10 years.

coefficients that range from .518 to .753, and are, in all cases, statistically indistinguishable from zero. Regardless of how one prefers to account for non-linearity, results are roughly the same (and diverge substantially from the result when we impose linearity). This is also true of the other three coefficients reanalyzed in Figure 4. Table 3 shows that the estimated effects of MID initiation after 5 years, and MID victory after 5 and 10 years from fractional polynomial and spline models are substantively similar to estimates from linear models that use the log-transformed version of CINC to control for capabilities.<sup>12</sup>

## Implications

This analysis has important implications for theorizing the link between status concerns and belligerence. Renshon invokes the apparent association between conflict and improved status as empirical support for a theoretical claim that we can most usefully understand the link between status dissatisfaction and belligerence as instrumental: dissatisfied states initiate conflicts not due to frustration or political dysfunction but because leaders rightly view fighting as a reasonable strategy for improving status. But, once we model the relationship between material capabilities and diplomatic rank appropriately, there is no reliable relationship between conflict behavior and improved diplomatic rank. There is still no compelling empirical reason to favor strategic or instrumental mechanisms over others as we build accounts of how status concerns influence foreign policy. The debate between those who see belligerent status-seeking behavior as instrumentally rational and those who see it as pathological will – and should – continue. This also means that leaders should think twice before expending blood or treasure in a potentially violent quest for higher or more secure status. If conflict does not reliably improve status, then – even if status has instrumental value – fighting for status is not advisable.

The analysis here also has broader implications for other quantitative research that uses the CINC index to control for material power. While CINC is often log-transformed to address its skewed distribution and consequent heteroskedasticity, this is not a universal practice.<sup>13</sup> Yet the dramatic differences reported above in the estimates of conflict on changes in diplomatic rank from models that account for non-linearity and from those that do not suggest that the stakes may in some cases go beyond the treatment of inconsistent residuals and the proper estimation of standard errors. When the relationship between capabilities and an outcome variable is not well-described by a linear fit, imposing linearity can produce serious bias in the

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<sup>12</sup>Table 2A in the appendix shows that results do not change substantially when we allow for non-linearity in all continuous predictors.

<sup>13</sup>See, for instance, Gartzke and Jo (2009), Colgan (2014), and Way and Weeks (2014) for prominent examples of studies that use the raw CINC index to control for capabilities.

estimated effects of other variables of interest. Future work using the CINC index should be more consistently attentive to this issue.

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