Analyzing International Organizations: How the Concepts We Use Affect the Answers We Get

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Abstract

Concepts and measures of international organizations have been gradually diverging. The field maintains a broad conception of IOs that allows for significant internal variation, but has coalesced around a measurement that reflects the characteristics of the major post-World War Two IOs. Since the characteristics of global governance have shifted, prevailing measures of the IOs in operation and of the composition of states' IO memberships differ from the real quantities scholars aim to analyze. Specifically, prevailing measures only count formal IOs, bodies founded with legally binding agreements, and omit informal IOs, which are founded with non-legally binding instruments. Recent research demonstrates formal and informal IOs share many important features, but differ from each other in important ways. These differences imply that formal and informal IOs may have different effects in global politics. We study how the disconnect between concepts and measures matters for empirical research. Using new panel data on state membership in 217 informal IOs from 1815 to 2010, we find heterogeneous effects for different subtypes of IOs that conflict with existing theories to varying degrees. Existing findings are partly artifacts of the specific way that they operationalize key IO variables, which have not been acknowledged previously. Had alternative measures of key concepts prevailed earlier, IO research may have developed different theoretical arguments.

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Introduction

How do international organizations (IOs) shape global politics? Over the past 50 years, scholars have put forward and tested diverse theoretical arguments, positing *inter alia* that IOs socialize states to group norms, signal states' cooperative intentions, and help states implement domestic policy reforms. Advances in data availability, estimation techniques, and research design have enabled more credible claims about these processes. However, studies are only as strong as their conceptual foundations.[1] Prevailing concepts in a field of inquiry fundamentally shape analysis; conversely, conceptual innovation can overturn existing findings. In the context of foreign aid, new concepts and measures have largely confirmed existing theories, while sharpening our understanding of how aid conditionality works.[2] In the field of human rights, new measurements have reversed the prevailing wisdom about the respect for human rights over time.[3]

Innovations in concept formation and measurement are central drivers of the scientific process, along with advances in estimation and inference. In the study of IOs, however, progress on the latter has overtaken progress on the former. Many basic concepts in IO remain fuzzy and inconsistently applied. The concept of an IO—the entity that is naturally at the heart of this subfield—remains poorly articulated, inconsistently used, and uncritically measured. In much work, these bodies are conceived of in an encompassing manner that allows for diverse forms. However, during the case selection and measurement stages of the same research project, IOs bodies are then conceptualized in an excessively narrow way. In practice, the field maintains a broad understanding of IOs at the level of theory building, but has coalesced around a very specific and exclusionary measure of IOs for empirical research. We argue this practice produces a concept–measure mismatch that significantly impacts our understanding of IOs and global politics.

The narrow definition of IOs that empirical work has adopted privileges *legal formality*. International organizations are bodies created by states to pursue collective goals in international politics, but they can be founded with binding or non-binding instruments. When states design organizations using binding agreements, they create formal organizations. An alternate design choice to use non-binding legal instruments leads to the creation of informal IOs. In empirical research, formal IOs are counted, yet their informal counterparts are frequently

[1] Adcock and Collier 2001.
[2] Vreeland 2006.
[3] Fariss 2014.

omitted, despite their inherent similarities and widespread recognition of their importance for actual international cooperation. This means, in practice, that the evidence used by both qualitative and quantitative scholars is frequently confined to a narrow set of institutions that differs from the full population of IOs, as conceived by most IR scholars, international lawyers, and state practitioners. This mismatch is particularly clear when scholars study IOs using the Correlates of War dataset on Intergovernmental Organizations (COW), the most widely used dataset on IOs.[4] To be included in the COW dataset, an organization must meet the specific and exacting criteria of being established with a legally binding agreement. But this criteria diverges from prevailing conceptualizations of IOs, does not follow from Michael Wallace and David Singer's original intentions when designing the first COW dataset, and excludes hundreds of IOs that are established differently.

Scholars have argued that studying formal IOs might nevertheless mirror the full population of IOs, claiming that there are few informal IOs in practice and that the same processes may hold in both types of bodies.[5] Yet recent scholarship challenges both of these conjectures.[6] Informal IOs constitute roughly one-third of all operating IOs, making them a large share of all IOs. Furthermore, informal bodies have unique properties that lead them to operate in distinct ways. We argue these developments raise the possibility that existing findings about formal IOs may not hold for informal IOs or for the full population of IOs—i.e., when we consider formal and informal IOs together. The answers we have to questions about IOs may have been fundamentally shaped by the particular concepts and measures circulating in the field.

We believe this concept–measure disconnect stems, in part, from the availability of high-quality data on IO membership. The country-IO-year level data that quantitative research often requires has only been available for the formal IOs found in the COW dataset, yet it is not widely acknowledged that this dataset is built to identify a specific subtype of IOs that differs from the population of interest, all IOs. We study this concept–measure mismatch by creating a parallel dataset of informal IOs that complements COW. We use this to revisit three studies of IOs to examine whether and how key quantities of interest change when using different data on state membership in IOs.[7] All three studies develop their theoretical arguments making broad claims, but then evaluate them using the COW data on formal IOs. Our new data on informal IO membership and total IO membership permits us to find the limits of existing findings and

[4]Wallace and Singer 1970; Pevehouse, Nordstrom, and Warnke 2004.
[5]Cox and Jacobson 1973; Klabbers 2016.
[6]Vabulas and Snidal 2013; Sauer 2019; Roger 2020.
[7]Mansfield and Pevehouse 2006; Bernauer et al. 2010; Greenhill 2010.

assess heterogeneous effects of different types of IO membership. If existing findings about formal IOs are actually findings about all IOs, then new data will confirm this. However, if existing findings stem from erroneously treating formal IOs as synonymous with all IOs, then new data will challenge them.

It is difficult to know *ex ante* how using different data will affect findings in general. Without data on informal IO membership, it is impossible to know whether states have similar compositions of IO memberships across subtypes. For example, domestic political institutions may condition states' preferences over formality, leading states to interact with different counterparts across subtypes of IOs. The results from a reanalysis may either confirm, reverse, or nuance a previous finding; all are interesting for IO research. Overall, our reanalysis indicates that the concept–measure mismatch is a serious concern for the IO literature. Existing findings are sensitive to the precise operationalization of IO membership. As a corollary, this indicates that informal IOs are not direct analogues of formal IOs. The field may, correspondingly, have developed different theories of IOs had these other relationships been known at the time. However, in making this argument, we do not wish to claim that any individual study is invalid or that all studies are vulnerable to the criticisms we outline. Instead, we advocate that IO scholars think carefully about the match between concepts and measures in their studies and that they operationalize key ideas accordingly. This may take the form of more precise scope conditions or more carefully specified theories about how states use different types of institutions to pursue international cooperation.

This paper makes a conceptual contribution to understanding the contours of the term "international organization" and its development historically in International Relations. It then demonstrates how IO findings may be artifacts of specific operationalizations of key concepts, that may themselves be poor reflections of the underlying concepts—in ways that have not been previously acknowledged. Finally, we show that subtypes of IOs often have different effects in global politics, challenging scholars to engage more closely with this crucial dimension of institutional design.

Is There a Disconnect Between Our Concept of an International Organization and the Evidence We Use?

We are concerned that the measures researchers use in practice systematically diverge from the concepts embedded in their theoretical arguments. In many prominent studies, researchers typically adhere to a broad conception of IOs, but, equally often, they then evaluate arguments using a subset of the IOs in question. This phenomenon is widespread. But we believe that this disconnect stems in large part from coding decisions in the most widely used data on IOs: the Correlates of War Intergovernmental Organizations dataset (COW). So far, the country-IO-year level data that research often requires has only been available for formal IOs in the COW dataset. Yet it is not widely acknowledged that this dataset contains only a subset of all IOs. The implications of using COW *as if* it contain all IOs have not been appreciated or explored. In this section, we describe how the definition of IOs used in the COW dataset diverges from the broad conception of IOs that animated early research and that continues to structure IO theories, with an eye to clarifying the gap between concepts and measures.

Datasets of IOs are widely used and have been around, in one form or another, for some time. The first and most important effort to develop a database of IOs was undertaken by Wallace and Singer in the mid-1970s as part of the COW project.[8] They created their dataset to test hypotheses about the impact of international organizations on the incidence of war.[9] A related dataset was developed by Harold Jacobson and his coauthors to assess the effect of membership on the likelihood of conflict and national economic performance.[10] More recently, these data collection efforts have been carried forward by others, and using the COW data to test arguments in global politics has become the norm.[11] Today, the most frequently utilized dataset of remains the COW dataset, but it has been updated and refined by Jon Pevehouse and his colleagues.[12] It has proven to be particularly popular because it contains country-year membership data for over 600 IOs, active between 1815 and 2014, making it especially convenient for scholars trying to understand the drivers, dynamics and impacts of these consequential institutions. However, it not clear that this dataset always tracks what we mean by the term "international organization."

[8]Wallace and Singer 1970; Suzuki, Krause, and Singer 2002.
[9]Wallace and Singer 1970.
[10]Jacobson, Reisinger, and Mathers 1986.
[11]Pevehouse, Nordstrom, and Warnke 2004. According to Google Scholar, it has been cited by over 600 papers, making it by far the most widely cited dataset of IOs.
[12]The COW dataset was recently updated and extended to 2014. Pevehouse et al. 2019.

Specifically, it is crucial to highlight that the COW dataset focuses on a unique subset of IOs, known as *formal* IOs. This is stated clearly in the coding documents, but is rarely questioned in applied research. As COW's authors make clear, it only includes bodies that are: a) created by states, b) have a secretariat or other evidence of institutionalization, and c) are constituted by an "internationally recognized treaty."[13] There is certainly some rationale for this. Many of the most well-known IOs—such as, the United Nations (UN), the North Atlantic Treaty Organization (NATO), and the European Union (EU)—meet these criteria. As a result, when we think about IOs, formal institutions are often those that most immediately come to mind. Yet formals are hardly the only variety. In fact, political scientists have long acknowledged that there are different kinds of IOs out there.[14] International lawyers have recognized this as well. And, perhaps most important, practitioners and states have not regarded formal organizations as the only variety. Correspondingly, the "true" population of international organizations that most scholars have had in mind when they study these institutions has been broader.

There are several ways this is so. For instance, many have acknowledged that there are a large number of bodies that clearly "count" as IOs but which are not created by "states" per se. Many of these are constituted under the authority of other international organizations, violating the first criterion (a) for inclusion in the COW dataset. This phenomenon may seem strange, but such organizations are not unusual, as the prominence of the United Nations Environment Program (UNEP) attests. In fact, some have concluded that such bodies (often referred to as "emanations") actually represent the vast majority of the IOs active today.[15] Given that these institutions do not fall within COW's definition of a formal organization, they are not included in this dataset.[16] One might argue that such organizations are not independent from their formal parents, which are included in the COW dataset, such that their inclusion might be double counting. If so, then we may well be justified in excluding them from our analyses, at least for many purposes. But, in other instances, the de facto independence of these emanations makes excluding them on the basis of their lineage much weaker.

The limits of COW's criteria for tracking the population of IOs are also shown by another kind of exception to its rules: Organizations may be constituted by states and exhibit at least

[13]Pevehouse, Nordstrom, and Warnke 2004.

[14]Sometimes the term "international organizations" is applied to international non-governmental organizations. See, for instance, Wallace and Singer's extensive discussion of international NGOs in relation to COW. Wallace and Singer 1970, pp. 247, 240–241. In this article, we are only concerned with public international organizations.

[15]Shanks, Jacobson, and Kaplan 1996; Johnson 2014.

[16]Pevehouse, Nordstrom, and Warnke 2004, p. 104.

limited levels of institutionalization, yet be created without recourse to a legally binding international agreement. These institutions satisfy COW's first two criteria—they are independent organizations, created by states—but violate the third (c) that says a body must be created with an international treaty. These institutions are often referred to as "soft" or "informal" IOs.[17] Informal IOs are excluded from COW; yet, similarly to emanations, they have historically been part of the core idea of an IO.

Analytical interest in informal organizations has grown tremendously in recent years, especially following the pioneering work of Felicity Vabulas and Duncan Snidal.[18] Their research has been instrumental in calling attention to and more rigorously conceptualizing these important institutions. But the possibility that IOs may be constituted with non-binding agreements has a long intellectual lineage. Pitman Potter, arguably the most influential theorist of international organizations in the first part of the 20th century, was among the first to acknowledge this.[19] His efforts to define and classify IOs, which shape our thinking to this day, explicitly downplayed their legal nature. In 1935, in a pathbreaking article, Potter writes,

> it is not the legal elements in the situation, the mutual rights and obligations of the parties, much less the text expressing that legal element, that constitutes the organization, but the union of states, partly juristic but also largely practical in nature. It is not what the organization is constitutionally and legally [...] but what it actually does, that determines its real nature and significance."[20]

For Potter, what matters most is the "organization-hood" of the institutions that states established. This "union of states" ultimately compels us to regard a body as part of the "universe" of IOs, not its legal status. And Potter was not alone. In *The Anatomy of Influence*, another landmark study, Harold Jacobson and Robert Cox explicitly acknowledge that while many organizations are constituted formally by treaties, there are exceptions. "Given the nature of the international system," they write, "the creation of an international organization requires concrete action by states. Usually, *although not always*, such actions are consecrated in an international treaty."[21] These sorts of statements can be found in the writings of other scholars, from the 1930s to the present.[22]

[17] Klabbers 2001; Vabulas and Snidal 2013; Roger 2020.
[18] Vabulas and Snidal 2013.
[19] Potter 1922; Rochester 1986; Yalem 1966.
[20] Potter 1935, p. 218.
[21] Cox and Jacobson 1973, p. 5 Emphasis added
[22] For instance in a more recent study of formal international organizations, Volgy et al. 2009, pp. 13–14 recognize that such bodies are part of a broader category that includes "non-formal" international organizations as well.

We have seen that legal formality has *not* been an essential part of what it means to be an IO. This should not be surprising given developments in other fields, even in the COW dataset uses a more narrow definition. Many international lawyers, for instance, have reached nearly identical conclusions. Jan Klabbers, author of the most important textbook on international institutional law, observes, "[while] it is the case that most international organizations are set up on the basis of a treaty, this is not invariably the case." Indeed, he says, when creating an IO, "states have the choice between using a legally binding instrument and a non-legally binding instrument."[23] Other widely used texts make analogous points.[24] And, no less an authority than the International Law Commission states, while "[most] international organizations are established by a treaty," they are also "sometimes established without a treaty."[25] Lawyers have, therefore, acknowledged that being constituted by an international treaty is not determinative in any way.

The simplest reason behind this is the fact that *states* do not exclusively emphasize the legal nature of international organizations. Bodies like the Asia Pacific Economic Cooperation (APEC), the General Agreement on Tariffs and Trade (GATT), and the Nordic Council, among many others, have all been regarded as such and yet none was originally constituted by an international treaty.[26] National legislation on the privileges and immunities granted to IOs—one of the few places where states explain what, domestically, "counts" as an international organization—also reveals that states rarely define them exclusively on the basis of their legal nature. In Canada, the Foreign Missions and International Organizations Act of 1991 defines an international organization as an "organization, *whether or not established by treaty*, of which two or more states are members, and includes an intergovernmental conference in which two or more states participate."[27] Although it is impossible to review all such definitions here, similar ones can be found in the legislation of most OECD states—the creators of the vast majority of international organizations.[28] Few have explicitly restricted the term to formally constituted bodies only.

These observations clarify the core mismatch between concepts and measures in IO research. Frequently, studies aim to explain something about all IOs and do not restrict the scope

[23]Klabbers 2015, p. 144, Klabbers 2016.
[24]White 2005; Seyersted 2008.
[25]United Nations 2009, p. 27.
[26]Ironically, all are erroneously included in the COW dataset, despite violating the third criterion for inclusion. In total, we find that as many as 30 informal institutions are miscoded as formal international organizations.
[27]Government of Canada 1991, c. 41, sec. 2(1). Emphasis added.
[28]Reinisch 2013.

of their arguments to specific subtypes.[29] Yet, in practice, these studies often only analyze formal IOs, and are therefore silent about their generalizability to the full population of interest. This problem arises in quantitative and qualitative work, as well as in reference textbooks. For qualitative studies, this problem manifests when arguments are articulated about IOs in general, but then only formal IOs are selected as cases for comparative analysis. Textbooks, similarly, tend to define IOs broadly, but then introduce reader to only a few prominent postwar formal IOs.[30] Quantitative studies often strive for even more general arguments, but then often reproduce the same problem of sample selection by restricting their analyses to the formal IOs that constitute the COW dataset. When studies use data on formal IOs to support arguments about all IOs, they are gambling, since their inferences necessarily rest on a narrower empirical foundation. This raises important questions about whether these findings do in fact extend to the full population of IOs—i.e., formal and informal IOs together—and why. The next two sections examine these questions, first conceptually and then empirically.

Is the Disconnect (Really) A Problem for Analyses of International Organizations?

Clearly, there is a mismatch between the concept of an international organization and much of the evidence we frequently rely on. But does this matter? There are conditions when it may be safe to generalize from a narrow subset of formal bodies to the broader population of IOs. This would be so, first, if the number of excluded cases—informal IOs—were relatively small. If this were true, a sample of formal organizations would be virtually identical in composition to the total population. The impact of omitting these exceptions might provoke curiosity, but would probably not affect empirical findings. If formal IOs were a smaller share of total IOs, then conclusions based on a sample that excluded informals would be less dependable. This need not be true under all conditions, though. Drawing conclusions from a sample of formal organizations would be less problematic if there were few substantive differences between formal and informal bodies. If the two types of institutions were identical in fundamental respects, then

[29]There are, of course, a number of exceptions. The work of Volgy et al. 2009 is exemplary, since it situates formal organizations within a broader universe of institutions, which includes both formal and informal bodies. They then explicitly limit their causal claims to formal organizations. Jupille, Mattli, and Snidal 2013, p. 26, similarly, explain that their theory is not expected to apply to informal bodies.

[30]Most, interestingly, also rely on the wider measure of international organizations produced by the Union of International Associations—not COW data—to illustrate temporal patterns of cooperation, offering further evidence of a more encompassing definition.

a study based on only one would not be greatly affected by the absence of the other. Yet if this condition did not hold—that is, if there were important differences between these bodies—then studies using a narrower sample would be riskier. A similar argument would caution against making inferences about all IOs from a sample of informal IOs.

Until recently, scholars have not evaluated whether these conditions are ever satisfied in practice. Cox, Klabbers, and Jacobson have each claimed that informals are likely small in number and not all that different from their formal counterparts.[31] But the evidence supporting these statements has been thin. More worryingly, as our understanding of these institutions has improved, what we have learned undermines their assertions. Charles Roger, building on earlier efforts by Vabulas and Snidal, estimates that the number and share of informal organizations in the postwar period is much larger than previously thought.[32] Up until the 1960s, we show in figure 1, informal organizations constituted a tiny share of all the international organizations then in operation. Then, in the early 1970s, their growth rate began to pick up relative to that of formal ones. And, by 2005, they comprised roughly a third of all active international organizations. Today, their numbers are larger still. Thus, assertions that informal bodies are a relatively minor phenomenon are unwarranted. While it may have been safe to ignore informals in the 1960s when the first version of the COW dataset was created, this is much less likely to be true today.

Assuming that informals are essentially similar to formals is also problematic. Recent studies suggest that, although formal and informal bodies do share important featuresthey are, after all, both international organizationsthey can be different in consequential ways. First, informals are theorized to possess a number of *functional properties* that make them better or worse at *doing* different things for states. Vabulas and Snidal, find that informal organizations are typically faster, more flexible, and can offer states greater confidentiality than their formal counterparts.[33] Formal organizations, by contrast, can facilitate cooperation between larger groups of states, achieve greater scale and scope, and operate more independently. As a result, theory suggests formals and informals are created for different reasons. Informal organizations have been established when states face problems that are fast moving, rapidly changing, and more

[31]Cox and Jacobson 1973, p. 5, Klabbers 2016, p. 144, also see Klabbers 2001.

[32]Roger 2020. Roger's dataset use the same source material as the COW dataset: the *Yearbook of International Organizations*, published annually by the Union of International Associations 2009. As such, it is designed to be merged with the latter to provide researchers with a more accurate estimate of the "total" number of international organizations. For further details on the *Yearbook* including its advantages and underlying biases, see Saunier 2019.

[33]Vabulas and Snidal 2013. See also Bradford 2011; Eilstrup-Sangiovanni 2016; Sauer 2019.

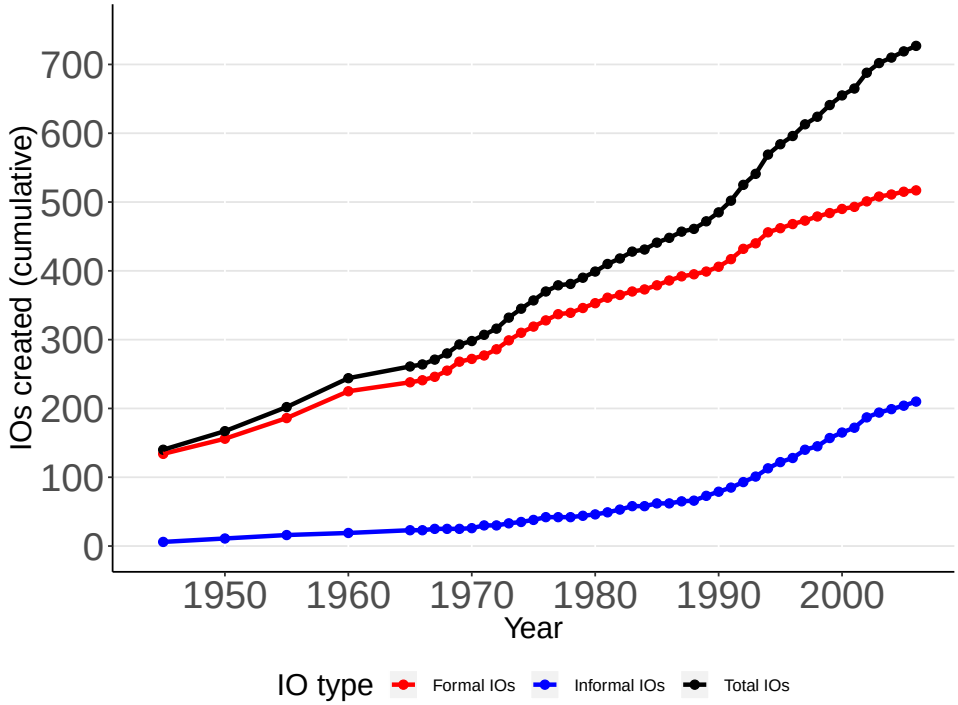

Figure 1: Growth of IOs over time

politically sensitive; formal organizations, by contrast, are chosen when there is greater scope for opportunism. Roger, similarly, shows that these bodies have different *domestic implications* and that these can shape institutional design.[34] When policymakers in powerful states face significant political opposition, they establish informal IOs since informality allows politicians to bypass such domestic constraints.

Other scholars argue informal IOs have different internal political dynamics, particularly once they are operational. Uwe Puetter and Tom Sauer show that informals offer social environments that are more conducive to deliberation and consensus-building.[35] By doing away with diplomatic formalities and shielding negotiations from the public eye, informal organizations help officials to engage in free-flowing dialogue and build more trusting relationships. This can, in turn, facilitate more effective persuasion, socialization, and policy learning. Kal Raustiala and Chris Brummer advance related arguments, suggesting that participation in informal bodies can encourage adherence to international rules, especially in particular issue-areas like the environment and global finance, since officials within informal bodies may foster closer interpersonal relationships and this correspondingly generates stronger reputational effects.[36]

[34]Roger 2020. See also Vabulas and Snidal 2017.
[35]Puetter 2006; Sauer 2019.
[36]Raustiala 2002; Brummer 2014.

Finally, Henry Farrell, Abraham Newman, and Elliot Posner demonstrate how access to informal bodies and reliance upon soft law can strengthen the hand of certain actors within states and help them to gain leverage in battles over domestic rulemaking.[37]

In practice, these studies imply that states' compositions of membership across formal and informal IOs may differ substantively. For example, states may prefer to coordinate with close allies in informal bodies or work with less ideologically proximate states in formal ones, implying different dynamics among members across subtypes. If a study combines two types of states—one set that prefers to govern through formal bodies and another that prefers informal ones—then measuring participation by counting only either subtype of IO will severely undercount membership for heterogeneous samples of states. The composition of memberships could differ across bodies in myriad ways. Assuming that dynamics within formal bodies are representative of dynamics across all IOs may yield misleading inferences. This assumption may have been justified previously by arguing that informal IOs were small in number or that they are essentially similar to formals. But it has become clear that neither of these statements holds true. Characterizing the attributes of all IOs by measuring only the attributes of a particular subtype of IOs (i.e., formals or informals) will lead to biased inferences about the population to the extent that the subtype differs substantively from the population. We have presented theoretical reasons why states may use formal and informal IOs differently, which could lead formal and informal IOs to differ. In the next section, we turn to assess these matter empirically.

Empirically Assessing How Our Concepts Can Matter

How does the concept of an international organization that we use shape the answers we get? To examine this question, we construct a new dataset of state membership in informal IOs. This dataset builds on one already published by Roger and adds information at the country-IO-year level.[38] We construct our dataset primarily from the same source material as the COW dataset, namely the Union of International Association's *Yearbook of International Organizations*.[39] The basic units in the two datasets are the samethey are all international organizationsand, at the most fundamental level, only differ in terms of their levels of legal formality. Roger's dataset contains information on the years in which each organization is established and the original members, or "founders," of each body. We supplement this version by adding country membership over time

[37]Newman and Posner 2018; Farrell and Newman 2019.
[38]Roger 2020.
[39]Union of International Associations 2009.

for 217 informal IOs. A handful of informal IOs are erroneously included in the COW dataset; these are removed from COW and added to our informal IO dataset. As a result, our measure of formal IO membership diverges slightly from the COW measure.

Our dataset is fully compatible with the COW dataset, allowing researchers to move between formal, informal, and total IO data as they wish. We use this compatibility to create three measures of state IO membership: in formals bodies, in informal bodies, and in all IOs. Figure 2 provides an indication of how IO memberships are related by plotting state membership in formal and informal IOs at four different time periods from 1955 to 2005. Figure 2 confirms there is substantial state-level variation in membership patterns, as some states join many more IOs than other states. States also consistently join more formal organizations than informal ones, but membership in the two types of organizations is positively correlated across time periods. The Spearman correlation coefficient for state membership in formal and informal organizations in each year ranges from roughly 0.6 to 0.7 between 1965 and 2005. Finally, subsets of states have very different membership portfolios, as indicated by the extent of their memberships in informal organizations compared to in formal ones. In 2005, many states had joined over 70 formal organizations, but had fewer than 15 informal memberships; whereas, other states had similar shares of formals and informal IO memberships.

The concept–measure mismatch raises theoretical and methodological concerns about the validity of existing studies. The mismatch raises two possible outcomes for a study that depend on the scope of that study's argument. For studies that intend to apply to all IOs but that are evaluated using only the COW dataset (in our experience, the vast majority of IO studies), the key question is whether the existing finding does in fact generalize to the full population of IOs. If the finding is similar in reanalysis using the full population of IOs, then the original inference is correct. However, if the finding does not hold using different data on IOs, then more restrictive scope conditions must be placed around the argument. For studies that intend to apply only to formal IOs and that are evaluated using only the COW dataset, there remains any interesting theoretical question of whether the finding may hold for IOs in general. Similarly to the above, reanalysis may either support the original inference or find that the relationship actually extends across subtypes of IOs such that the original scope conditions were too conservative. In both cases, we are interested in the robustness of the key finding when evaluated using new data.

We use new measures of state IO membership in formals bodies, in informal bodies, and in all IOs to reanalyze three existing studies that use the COW dataset of formal IO membership.

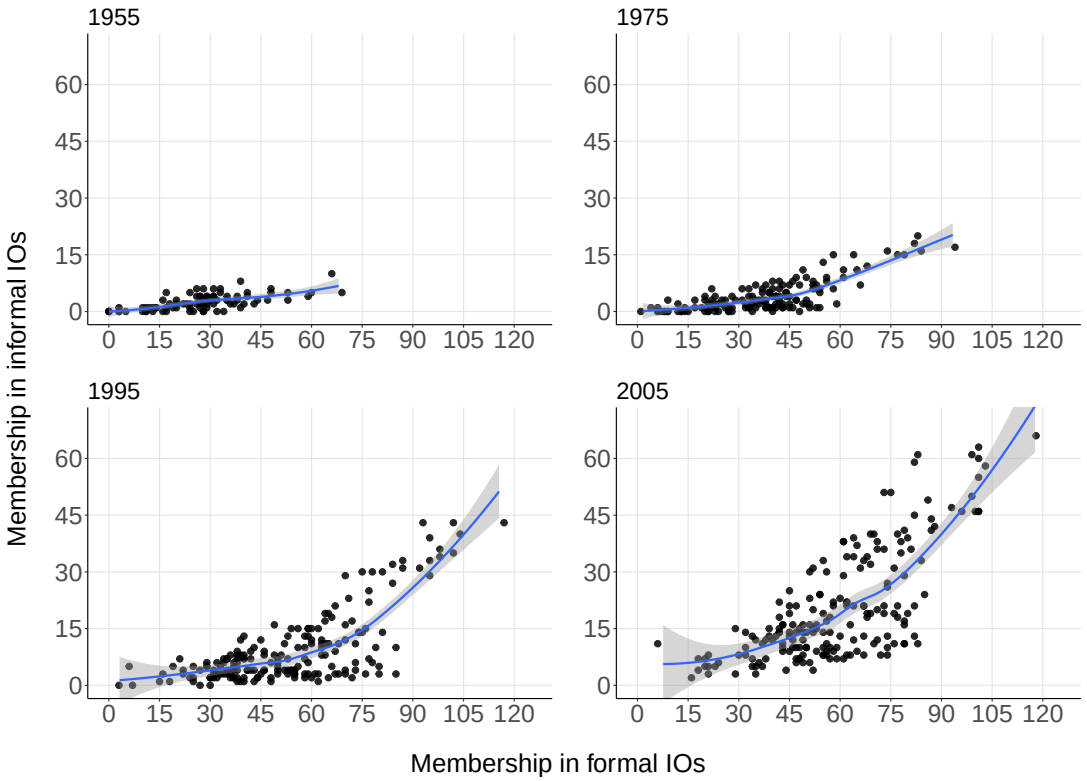

Figure 2: State membership in formal and informal IOs at four points in time

We are motivated to find the limits of their generalizability, with an eye to identifying gaps and room for innovation in IO theories. The primary outcome of interest in our reanalyses is the stability of the key regression coefficients when estimated using different measures of IO membership.

We selected three cases for reanalysis to maximize the breadth of coverage. We analyze studies that evaluate IOs as forums for socialization, as tools of states, and as signals of commitment—three of the major mechanisms in the IO literature. All three studies make use of the COW dataset but make arguments about IOs in general; none explicitly limits its arguments to formal IOs alone or develops its argument with direct references to the formal nature of the institutions they investigate. We also selected studies where differences across measures would be clear. Some candidate studies construct complex composite measures of membership that can be difficult to replicate and interpret, but the studies we analyze are relatively straightforward. Finally, we selected studies that employ strong research designs, are highly cited, and have been published in leading journals. We believe these studies should be fairly representative of best practices in the field and should be tough cases for our argument. For each study, our aim is to observe how results change when we operationalize the concept of an international organization in different ways. Overall, the results of our reanalysis provide strong evidence

that the measures we use matter a great deal, indicating that research should be much more attentive operationalizing key concepts.

Human Rights and the Role of International Organizations as Forums for Socialization

Do IOs act as forums for socialization? Brian Greenhill investigates this by studying how the human rights practices of a state's counterparts in IOs influences their own domestic human rights practices. This study builds on a constructivist literature that explores how states' interests can be reformulated "through [processes] of interaction with other states, whereby states copy, or learn from, the forms of behavior exhibited by others."[40] The argument is that IOs provide venues for interaction and that when actors adhering to widely different norms, or possessing very different identities, are brought together on a regular basis this should lead to a level of normative convergence that would not be expected otherwise. Greenhill investigates this hypothesis by focusing on how such socialization might shape the human rights practices of states. He argues that, if this theory is right, joint membership in IOs should lead to improvements in human rights practices when states are members of bodies where other member states have strong respect for domestic human rights.

To evaluate his argument, Greenhill measures the average human rights protection afforded by members of an international organization—the membership "context" of an IO—then aggregates this across a state's portfolio of IO memberships. Each value represents the average level of respect for human rights among the members of an IO averaged over each body that a country is a member of (see equation 1). The sample of organizations that Greenhill uses is the COW dataset, meaning that the theory is by default being tested on formal organizations only. However, the theoretical argument he advances does not explicitly state scope conditions that limit the mechanism to these bodies alone. In our view, there would be little reason to: formal organizations constitute only a fraction of the venues in which state officials interact with their foreign counterparts. Informal organizations, for instance, offer equally plausible forums where the kinds of mechanisms Greenhill explores may operate. Indeed, as discussed earlier, some have even argued that informal bodies can offer superior environments for the transmission of norms.[41] Within informal organizations, government officials may have greater privacy, which

[40] Greenhill 2010, p. 129.

[41] Checkel 2001 has also hypothesized that privacy, which is typically thought of as a key property of informal

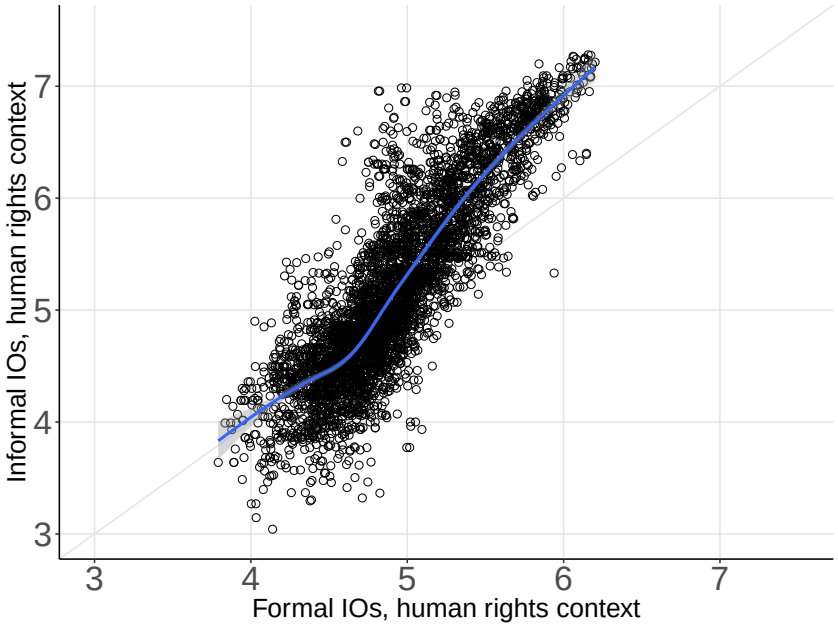

Figure 3: Human rights context in formal and informal IOs

may promote franker discussion and ultimately facilitate more effective persuasion. There are, therefore, strong reasons to think that the effect of membership should even be stronger among informal institutions and, correspondingly, our estimate of this effect may differ when we consider the total population of international organizations.

We explore this idea by replicating Greenhill's study using new indicators of the normative context states confront across their IO memberships. We do so using membership data for formal organizations and informal organizations only (from the COW dataset and the new dataset developed for this paper, respectively), as well as a combined measure of the total population of international organization (which combines them both). The membership context variable is constructed as follows for each dataset:

$$\text{IO Context}_{it}^{d} = \frac{\sum_{j=1}^{J}(\overline{\text{HR}}_{\neg ijt}|\text{IO}_{ijt}^{d} = 1)}{\#\text{IOs}_{it}^{d}} \tag{1}$$

where $d \in \{\text{Greenhill, Formal IOs, Informal IOs, Total IOs}\}$ indexes the different IO datasets, i indexes states, $j \in J$ indexes IOs, t indexes time, and $\overline{\text{HR}}$ denotes the average human rights score of IO members other than state i. The final measure is the average human rights score of other member states involved in all the IOs that state i is a member of in each year.

If states have preferences over formality and these preferences covary with their domestic

organization, provides a favourable context for socialization processes.

human rights practices, then the two membership context measures could diverge. Furthermore, it is not implausible that states would select their institutional memberships based on the policies of existing member states, leading the two measures to diverge as well. And, in practice, though the formal and informal IO context variables are broadly similar (Pearson's $r = 0.89$), the informal IO context scores are higher than formal IO context scores, on average, and there is plenty of variation around the local means. Figure 3 plots states' formal IO context (x-axis) against their informal IO context (y-axis).

Greenhill estimates an ordered probit model on panel data with lagged independent variables and a lagged dependent variable.[42] The inclusion of the lagged dependent variable as a regressor means that the proper interpretation of the dependent variable is the annual change in countries' respect for human rights.[43] Specifically, we estimate versions of the following econometric model:

$$Prob(\text{CIRI}_{it} = l) = Prob(\kappa_{l-1} < \beta\, \text{IO Context}^{d}_{it-1} + \delta \text{CIRI}_{it-1} + \boldsymbol{\gamma}\mathbf{C}_{it-1} + \epsilon_{it} < \kappa_l) \quad (2)$$

where $d \in \{\text{Greenhill, Formal IOs, Informal IOs, Total IOs}\}$ indexes the IO context measures from different datasets, i indexes states, t indexes time periods, $l \in L$ indexes the eight levels of Cignarelli and Richards' (CIRI) physical integrity rights scores, and $\mathbf{C}$ is a vector of country-level covariates. We are interested in the stability of β, the coefficient on our measures of states' human rights context across the different samples of IOs.

Table 1 reports our reanalyisis of Greenhill's main model. In model I, we present the baseline model from Greenhill's paper, using his own IO context variable and the full set of controls from his replication files. In model II, we evaluate a formal IO-only context variable that removes a number of informal organizations that are coded as being formal in the COW dataset. For formal IOs only, we find that the statistical significance of the coefficient is reduced to the $p < 0.10$ confidence level and the magnitude of the effect is roughly 25% smaller, implying that some of the original effect size in the COW-IO dataset may be driven by informals it contains. This supposition is broadly confirmed, in model III, where we predict human rights practices using the informal IO context variable. We find a positive and statistically significant relationship ($p < 0.039$) between states' informal IO context and changes in their human rights

[42] Regression tables in the main text have been abbreviated. Full tables that include coefficients for control variables are available in the appendix.

[43] Several lag structures are plausible. Greenhill's results are robust to one through five-year lags. We report only the one-year lag, though our results are unchanged with different lag structures.

	Physical integrity scores			
	I	II	III	IV
Greenhill IO context	0.256**			
	(0.095)			
Formals only IO context		0.187+		
		(0.099)		
Informals only IO context			0.109*	
			(0.053)	
Total IO context				0.171+
				(0.091)
Observations	2,244	2,244	2,226	2,244
Number of countries	137	137	137	137
Pseudo R^2	0.283	0.283	0.282	0.283
Log likelihood	-3412	-3415	-3390	-3415

Table 1: Exact replications of Greenhill (2010: table 2, model 1). Ordered probit model with lagged dependent variable and robust standard errors clustered by country. Outcome variable is the 8-point Cignarelli and Richards (CIRI) physical integrity score. Independent variables are lagged one year, though the results are robust to other lag structures. The unit of observation is country years from 1981 to 2004. Control variables suppressed, see supplementary table S-1. ** p<0.01, * p<0.05, + p<0.10

practices, though the effect is roughly half of size as the study's original estimate. In model IV, we consider the human rights context across all IOs and find a similar relationship as for formal IOs only: an attenuated but positive relationship that is only statistically significant at the $p <$ 0.10 level.

In our view, the results of our reanalysis broadly support existing theoretical arguments that international organizations can be forums for socialization. This is a best case scenario for the literature, where an existing finding is confirmed with new data. Across all three measures of human rights context, the key coefficients are positive, suggesting that interacting in IOs leads to improvements in human rights practices when states' counterparts have strong respect for human rights. We find that the human rights context of IOs in general prompts greater respect for human rights. We also find that the socializing effect of informal IOs is more precisely estimated (lower p-value) than that of formal bodies. This opens the possibility of heterogeneous socializing effects for subtypes of IOs and suggests that informal organizations are more potent forums, in line with some existing arguments. However, the socializing effects of informal IOs in the most precisely estimated model (model III) is much smaller than the original study. The reasons behind these contrasting effects remain unclear. Future work will have to investigate the sources of these divergent effects more carefully. For current purposes, it

is important to observe how a focus on formal organizations alone can affect findings, supporting our argument that measures can drive findings.

Democratization and the Drivers of Membership in International Organizations

Why do states join IOs? Many studies argue states join IOs to coordinate with others and solve problems that they could not on their own. However, Edward Mansfield and Jon Pevehouse have argued that IOs can provide important domestic benefits too. Their study draws attention to how membership can help democratizing states cement or "lock in" liberal reforms, serving as a useful tool for politicians in this regard. They do so, first, by transmitting information about leaders' behaviour and "sounding an alarm" if reforms fall short. Second, IOs may be able to impose conditions on those seeking membership, driving behavioural convergence around liberal practices. And, finally, IO membership raises the costs of reform-reversals, since such moves may be punished through sanctions, suspensions, or expulsions that can disrupt the stream of benefits that flow from international cooperation. In view of these benefits, Mansfield and Pevehouse argue that democratizing states should join more IOs.[44]

Should this theory apply to formal organizations only? In their theoretical exposition, Mansfield and Pevehouse are unclear on this point. They delineate their subject in an expansive way. They cite the definition of an international organization advanced by Jacobson and his colleagues, which is much broader than that embedded in the COW dataset they later rely on.[45] Furthermore, despite the importance of formality for the COW dataset, the study does not generally refer to the formality or the legal characteristics of international organizations. The study alludes to the reputational effects of violating international agreements, for instance, but the word "law" does not appear in the text itself. Certainly, there are reasons to think that the legal nature of such bodies may be important for the mechanisms that Mansfield and Pevehouse think are at work. Binding agreements may raise the costs of policy reversals more than non-binding ones, for instance. However, it is equally true that the mechanisms of policy surveillance, membership conditionality, and "lock in" effects are not limited to formal organizations alone, or

[44] Mansfield and Pevehouse 2006, pp. 140–141.

[45] Shanks et al. define IOs as, "associations established by governments or their representatives that are sufficiently institutionalized to require regular meetings, rules governing decision-making, a permanent staff, and a headquarters." The definition makes no mention of the formality of an IO. Mansfield and Pevehouse 2006, p. 138, Shanks, Jacobson, and Kaplan 1996, p. 593.

that reputational effects are confined to formal agreements. As discussed earlier, membership in informal organizations has been thought by some to facilitate treaty compliance through reputational mechanisms, and can provide leverage to domestic actors in their battles over domestic rule-making. Thus, at the very least, it is unclear what our expectation should be in this case. The effect that Mansfield and Pevehouse identify may extend fairly readily to informal organizations, or it may be weaker or non-existent.

As before, we investigate how the concepts deployed can affect empirical results by reanalyzing this study. In their analysis, Mansfield and Pevehouse predict changes in the sum of a state's IO membership by estimating a linear regression model with panel-corrected standard errors. We start by replicating their analysis using the authors' original data for the independent variables, along with modified data for the dependent variables. Specifically, we estimate versions of the following econometric model:

$$\begin{aligned}\Delta\#\text{IOs}_{it}^{d} = \beta_1 \text{Democratization}_{it} + \beta_2 \text{Autocratization}_{it} + \beta_3 \text{StableDemocracy}_{it} + \\ \boldsymbol{\gamma}\mathbf{C}_{it} + \boldsymbol{\delta}\mathbf{Z}_{t} + \alpha_r + \epsilon_{it}\end{aligned} \tag{3}$$

where $d \in$ {Mansfield & Pevehouse, Formal IOs, Informal IOs, Total IOs} indexes the IO measures from different datasets, i indexes states, r indexes regions, t indexes time periods, $\mathbf{C}$ is a vector of country-level covariates, and $\mathbf{Z}$ is a vector of time-varying, system-level covariates. Regime change (democratization and autocratization) are measured as changes in regime type compared to five years prior, using changes in countries' Polity scores. Stable autocracy is the left-out regime category. We are interested in the stability of β_1, the coefficient on democratization estimated using different IO datasets.

Table 2 presents the results of our analysis. We start, in model V, by replicating the study's original finding. We recover the same positive, statistically significant effect of democratization on membership. We find similar, though somewhat weaker, substantive effects in model VI, where we use our revised measure of formal organizations. We investigate changes in total membership (i.e. both formal and informal organizations) in model VIII. Here the results are weaker—10–30% depending on the model it is compared to—but still positive and statistically significant. We demonstrate, next, that this attenuation likely stems from the role of informal organizations. In model VII, we find that democratization has no apparent effect on states' decisions to join informal bodies.

The results of our replication again reshape our interpretation of this study, adding nuance

	M&P IOs V	Formal IOs VI	Informal IOs VII	Total IOs VIII
Democratization	0.34**	0.26**	0.03	0.23*
	(0.10)	(0.08)	(0.04)	(0.09)
Autocratization	-0.13	-0.05	-0.05	-0.03
	(0.09)	(0.07)	(0.03)	(0.08)
Stable Democracy	0.25**	0.17**	-0.09+	0.23**
	(0.07)	(0.06)	(0.05)	(0.08)
Observations	4,665	4,665	4,665	4,665
Number of countries	173	173	173	173
R^2	0.05	0.08	0.46	0.25

Table 2: Exact replications of Mansfield & Pevehouse (2006: table 2, model 1.1). OLS models with panel-corrected standard errors in parentheses. Outcome variable is the number of IOs joined ($\Delta\#IO_{it,it-1}$). Democratization equals 1 if a state democratized in the previous 5 years. The unit of observation is country years from 1965 to 2000. Control variables suppressed, see supplementary table S-2. ** p<0.01, * p<0.05, + p<0.10

to existing findings about how democratizing states use IOs as tools to cement liberal reforms. Specifically, we find that democratizing states reach out to formal bodies, but not informal ones, during the transition process. Overall, the net effect remains positive, but it is also smaller in magnitude, since the effect of IOs appears to be heterogeneous. This finding therefore helps to illustrate our concerns about how different ways of measuring IOs can affect our results. It offers a mixed case for the literature since the net effect of IOs is similar, but points to meaningful heterogeneity across subtypes of IOs. At a general level, this emphasizes that research should focus carefully on the close alignment of concepts and measures, and should be much more specific about a theory's scope conditions. Future research should further theorize the nature of the relationship between democratization and IO membership in light of the heterogeneous effects we find. Do democratizing states seek "formality," and if so, why? What is it that formal organizations provide that informal organizations do not that yields this divergent pattern?

Assessing Domestic and International Drivers of Global Governance

Finally, we revisit a study by Thomas Bernauer, Anna Kahlbenn, Vally Koubi, and Gabriele Spilker. This study aims to assess whether state ratification of international environmental agreements (IEAs) is better explained by "domestic" or "international" factors.[46] Domestic factors are those linked to states' internal political and economic systems, such as political

[46]Bernauer et al. 2010.

institutions and income. International factors, on the other hand, are those linked to states' relationships with other actors, such as regional or peer effects. Bernauer et al. operationalize these latter linkages with several indicators, but mainly focus on the extent of states' pre-existing memberships in IOs. The study argues that state IO membership is linked to broader global governance behaviour (such as, the ratification of IEAs) since "more extensive membership in international organizations motivates states to behave more co-operatively when it comes to forms of international cooperation that lie outside the scope of specific international organizations they have joined at some prior time."[47] This expectation is further justified by arguing that "membership in international organizations signals a general willingness of states to behave co-operatively in international matters, which states may also carry over to other very particular issue areas such as environmental policy."[48] For the authors, then, the extensiveness of a state's membership in IOs both directly encourages cooperative behaviour, perhaps through socialization processes like those described by Greenhill, and signals to others that a state may be a "good" cooperative partner.

As with the other studies we have considered, this one operationalizes state membership in IOs using the COW dataset and finds that membership is indeed a major determinant of IEA ratifications, outweighing the effect of the domestic drivers they consider. This study concludes that international drivers are more important for explaining patterns of global governance than domestic factors. However, in our view, it is important to note that the causal mechanism advanced in the paper does not provide strong grounds for limiting the analysis to formal organizations. The argument, as stated, applies to IOs as such, and does not offer any explanation to qualify the argument's scope with respect to legal formality. As we saw with human rights, membership in any kind of IO could encourage cooperative behaviour and indicate greater "general willingness" to cooperate internationally. If only formal organizations have the effect they find, then it would seem that the inference should more qualified: membership in more legalized institutions—not international factors per se—driver governance patterns, perhaps because greater formality screens cooperators more effectively.

To what extent, then, does this finding rest on the particular way that the study operationalizes the concept of IOs? Does the finding change if we operationalize the concept differently, and, if so, what does this say about the theoretical argument? We investigate these questions by revisiting the study's main finding using our new dataset of state membership in formal and

[47]Bernauer et al. 2010, p. 514.
[48]Bernauer et al. 2010, p. 515.

informal organizations. Bernauer et al. estimate a logistic regression model treating a state's binary IEA ratification as grouped duration data with the time interval set to one year. The unit of observation is the country-treaty pair in each year, allowing the inclusion of treaty-specific and country-specific covariates. The study models time dependence using cubic time polynomials. Here, we estimate versions of the following econometric model:

$$\begin{aligned} Prob(\text{Ratification}_{ijt} = 1 | \text{Ratification}_{ijt-1} \neq 1) = logit^{-1}(\beta \#\text{IOs}_{it}^{d} + \\ \boldsymbol{\gamma}\mathbf{C}_{it} + \boldsymbol{\zeta}\mathbf{X}_{ijt} + \boldsymbol{\theta}\mathbf{W}_{jt} + \boldsymbol{\delta}\mathbf{Z}_{t} + \alpha_r + \epsilon_{ijt}) \end{aligned} \tag{4}$$

where $d \in \{\text{Bernauer et al., Formal IOs, Informal IOs, Total IOs}\}$ indexes the IO measures from different datasets, i indexes states, r indexes regions, j indexes IEAs, t indexes time periods, $\mathbf{C}$ is a vector of country-level covariates, $\mathbf{X}$ is a vector of country-treaty-level covariates, $\mathbf{W}$ is a vector of treaty-year covariates, and $\mathbf{Z}$ is a vector of time-varying, system-level covariates. We are interested in the stability of β, the coefficient on the count of IO memberships across datasets.

In table 3, we begin by replicating Bernauer et al.'s main finding using their published dataset in model X. We recover the same statistically significant positive effect of memberships on IEA ratifications. In model XI, we again conduct a replication using our revised membership data for formal organizations. We continue to match the original finding that membership is associated with greater ratification of IEAs. The results begin to diverge in models XII through XIII. First, in model XII, we find no effect of membership in informal institutions on IEA ratification, even though the study's theoretical argument should be expected to generalize to this domain. Second, in model XIII we while we continue to find that states that join more IOs ratify more IEAs, the substantive effect of membership is nearly halved. This attenuation is important for the study's implications, where the authors relied on the large coefficient found in model X to stress the importance of international over domestic factors as drivers of participation in global governance. The effect of membership is now weaker than regime type and comparable to many of the other variables in the model.

A key implication from this study is, therefore, not robust to this alternative specification of the independent variable. This leads to a very different conclusions than the one that Bernauer et al. reach. "International factors" do not have uniform effects on IEA ratification and, overall, appear to be much weaker than domestic ones. We find, instead, a more complicated relationship that forces us to rethink the causal processes underlying these statistical results and any link

	IEA ratification			
	IX	X	XI	XII
Bernauer et al. IOs	0.011**			
	(0.004)			
Formals IOs		0.012**		
		(0.004)		
Informal IOs			-0.001	
			(0.007)	
Total IOs				0.007*
				(0.003)
Observations	574,196	574,196	574,196	574,196
Number of countries	156	156	156	156
Log likelihood	-27208	-27205	-27257	-27227
Pseudo R^2	0.197	0.197	0.195	0.196

Table 3: Exact replications of Bernauer et al. (2010: table 3, model 2). Logistic regression with cubic time polynomials. Robust standard errors clustered by country in parentheses. Outcome variable is country *i* ratification of IEA *j* in year *t*. The unit of observation is country-treaty-years from 1950 to 2000. Control variables suppressed, see supplementary table S-3. ** p<0.01, * p<0.05, + p<0.10

between membership and broader global governance dynamics. Evidently, not all memberships in international institutions are equal. Instead, there appears to be significant unobserved heterogeneity across the states that participate extensively in formal organizations and those that participate more in informal ones. This heterogeneity could be accounted for if one "type" of states prefers "harder" forms of international cooperation, which manifests in governing transboundary environmental problems using binding environmental treaties and governing other international issues similarly with formal, hard law organizations. By contrast, another type of state prefers less institutionalization in international cooperation, which manifests as a greater share of memberships and choices to address transboundary environmental problems using a range of "softer" policy instruments that are not fully captured by the IEA ratification variable. In this sense, the original study may be capturing the effect of domestic preferences for formality rather than the impacts of membership. More needs to be done to test this possibility. The key point, here, is that this case illustrates our main concern: that findings in the field may be shaped to a considerable degree by the concepts uncritically embedded in our measures.

Conclusion

Knowledge is shaped by the concepts and measures at hand. IOs are a diverse bunch. They are more or less centralized, flexible, and expansive in scope. Nonetheless, we frequently treat IOs as a coherent set, count membership across them, and use this measure to draw inferences about global politics. However, the organizations that we have been counting are actually not the whole population of IOs; the organizations we have been counting differ systematically from this complete set. We over-study formal international organizations—IOs founded with legally binding treaties—and therefore risk forming misleading pictures of global politics.

The field has adhered to a broad understanding of institutional forms, but empirical work revolves around a narrow set of IOs that possess legal formality. Legal formality is a high bar to clear in international politics. This threshold truncates the universe of cases at an exacting threshold, thereby omitting roughly a third of all IOs. This is ironic given that Wallace and Singer's stated ambition in building the original COW dataset was to "measur[e] and describ[e] ... the amount of intergovernmental organization (or IGO) in the international system."[49]

We have seen above that IR research theorizes on the basis of a broad conception of IOs, only to later collapse measurement using a specific subtype. Samples of data will distort analyses if they do not reflect all the contours of the phenomenon of interest. We do not generalize about international trade flows by measuring only trade in goods; we do not study international organizations by considering only bodies with universal membership; yet, we frequently do analyze international organizations by counting only formal ones.

This mismatch between concepts and measures has important theoretical and methodological implications. In the past, when the number of informal IOs was low, this mismatch may have been innocuous. However, informal IOs have risen dramatically and, crucially, operate differently from their formal siblings. Existing scholarship suggests that informal IOs are faster, nimbler, more discreet, and empower different kinds of domestic actors than formal bodies. In light of these contrasts, we should also expect them to have different effects. Since states will have different compositions of formal and informal membership, studies that pool states with high and low shares of informal IO memberships relative to formal membership will be the most likely to be revised by new IO membership data. Ultimately, the formality of an IO is a design feature and, in this respect, our study builds on a long tradition of IO scholarship investigating

[49] Wallace and Singer 1970, p. 240.

IO measure	Greenhill (2010)	Mansfield & Pevehouse (2006)	Bernauer et al. (2010)
Formal IOs	Smaller effect	Similar, smaller effect	Virtually identical effect
Informal IOs	Smaller effect	No effect	No effect
Total IOs	Smaller effect	Similar, smaller effect	Similar, smaller effect
Implication	Mechanism applies to all bodies; original conclusions supported	Mechanism limited to formal IOs; original conclusions refined	Mechanism limited to formals; qualitatively different conclusion

Table 5: Reanalysis findings and implications

institutional design.[50]

We examined the concept–measure disconnect using a new dataset of state membership in informal IOs that supplements the existing COW dataset. We revisited three key studies of IOs and found that some findings hold for both formal and informal IOs, though others are challenged. Table 5 summarizes our empirical results. Across three cases, we find that measurements using all IOs have smaller effects sizes. Twice we find that formal and informal IOs operate differently, with no effect for informal IOs. This raises the interesting possibility that studies may have found the opposite (i.e., no effect of formal IOs, but an effect of informal IOs) but may not have been published due to publication bias surrounding null results and were therefore not available for reanalysis.

The similarities and differences are both exciting and a cause for concern. There are important differences across IOs that we are only just beginning to understand. Since research has not been attentive to these differences in the past, certain findings may be more tenuous than previously realized. We do not suggest that every study of IOs mismatches concepts and measures. Some are very clear about their theoretical underpinnings and scope conditions. For example, research on Article VIII of the International Monetary Fund is explicitly concerned with the *legal* nature of the commitment to capital account liberalization, so we do not expect informality to challenge these findings.[51] But, clearly, even in relatively well-established studies, different ways of operationalizing key ideas can lead to very different results.

Moving forward, it is essential that scholars foreground the theoretical mechanisms they expect to be operating when selecting a measure of IO membership. For a given argument, it is important to be explicit about what work IOs are expected to do. Membership in IOs often

[50] Abbott et al. 2000; Koremenos, Lipson, and Snidal 2001.
[51] Simmons 2000; Von Stein 2005.

stands in for the depth of a state's engagement in global governance, their underlying propensity to cooperate, their affinity with other states, or their willingness to agree to international law, among other concepts. Across these examples, different indicators may be better aligned with the underlying concept. Unless this concept depends on legal formality, we suggest that researchers interested in international organizations membership consider a combined measure of total membership as the most appropriate indicator, though others may be also available.

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A Supplementary tables

In this section, we provide the full regression tables for the replications conducted above.

Table S-1: IOs as forums for socialization

	Physical integrity scores			
	I	II	III	IV
Greenhill IO context	0.256**			
	(0.095)			
Formals only IO context		0.187+		
		(0.099)		
Informals only IO context			0.109*	
			(0.053)	
Total IO context				0.171+
				(0.091)
Lagged dependent variable	0.532**	0.537**	0.534**	0.537**
	(0.022)	(0.022)	(0.022)	(0.022)
FDI	0.000	0.000	0.000	0.000
	(0.001)	(0.002)	(0.001)	(0.002)
Trade	0.004**	0.004**	0.004**	0.004**
	(0.001)	(0.001)	(0.001)	(0.001)
Population density	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Polity	0.014**	0.014**	0.015**	0.014**
	(0.005)	(0.005)	(0.005)	(0.005)
Regime durability	0.003*	0.003*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Common language	0.024	0.027	0.033+	0.028+
	(0.017)	(0.016)	(0.017)	(0.017)
Common colonial history	-0.023	-0.017	-0.017	-0.017
	(0.020)	(0.021)	(0.021)	(0.021)
Neighbourhood effect	0.035	0.039+	0.039+	0.038+
	(0.021)	(0.022)	(0.022)	(0.022)
Hard PTA	-0.082	-0.081	-0.104	-0.095
	(0.090)	(0.089)	(0.093)	(0.091)
Soft PTA	0.116+	0.110	0.105	0.102
	(0.070)	(0.069)	(0.069)	(0.069)
Civil war	-0.401**	-0.384**	-0.397**	-0.383**
	(0.096)	(0.095)	(0.095)	(0.095)
International war	-0.505**	-0.465**	-0.386**	-0.447**
	(0.124)	(0.120)	(0.111)	(0.115)
GDP (log)	0.101**	0.102**	0.098**	0.100**
	(0.034)	(0.034)	(0.035)	(0.035)
/cut1	1.918**	1.568**	1.243**	1.488**
	(0.452)	(0.413)	(0.283)	(0.376)
/cut2	2.621**	2.273**	1.948**	2.192**
	(0.450)	(0.412)	(0.276)	(0.374)
/cut3	3.266**	2.918**	2.590**	2.837**

	(0.452)	(0.413)	(0.286)	(0.378)
/cut4	3.850**	3.502**	3.174**	3.421**
	(0.452)	(0.413)	(0.287)	(0.378)
/cut5	4.618**	4.268**	3.940**	4.187**
	(0.456)	(0.418)	(0.291)	(0.383)
/cut6	5.354**	5.001**	4.674**	4.921**
	(0.460)	(0.422)	(0.297)	(0.386)
/cut7	6.118**	5.764**	5.435**	5.684**
	(0.464)	(0.425)	(0.299)	(0.390)
/cut8	7.141**	6.785**	6.455**	6.705**
	(0.476)	(0.434)	(0.309)	(0.399)
Observations	2,244	2,244	2,226	2,244
Number of countries	137	137	137	137
Pseudo R^2	0.283	0.283	0.282	0.283
Log likelihood	-3412	-3415	-3390	-3415

Replications of Greenhill 2010: table 2, model 1
Ordered probit model with lagged dependent variable
Outcome variable: 8-point Cignarelli and Richards Physical Integrity Score
Unit of observation: country years, 1981–2000
IO context: Mean physical integrity score of common IGO members
Independent variables lagged one year
Reference region is Europe
Robust standard errors clustered by country in parentheses
** p<0.01, * p<0.05, + p<0.1

Table S-2: IOs as tools for democratization

	ΔM&P IOs V	ΔFormal IOs VI	ΔInformal IOs VII	ΔTotal IOs VIII
Democratization	0.34**	0.26**	0.03	0.23*
	(0.10)	(0.08)	(0.04)	(0.09)
Autocratization	-0.13	-0.05	-0.05	-0.03
	(0.09)	(0.07)	(0.03)	(0.08)
Stable Democracy	0.25**	0.17**	-0.09+	0.23**
	(0.07)	(0.06)	(0.05)	(0.08)
Mansfield and Pevehouse IOs	0.00			
	(0.00)			
Formal IOs		0.01**		
		(0.00)		
Informal IOs			0.08**	
			(0.01)	
Total IOs				0.03**
				(0.00)
Dispute	-0.05**	-0.03*	-0.01	-0.03+
	(0.02)	(0.01)	(0.01)	(0.02)
Hegemony	-23.11**	-9.83	-0.89	-10.57
	(7.39)	(6.23)	(2.63)	(7.50)
Year	-0.06**	-0.03+	-0.00	-0.02
	(0.02)	(0.02)	(0.01)	(0.02)
Former Communist	0.99**	1.12**	0.53**	1.65**
	(0.20)	(0.21)	(0.17)	(0.22)
Independence	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
North America	-0.25	-0.15	-0.20*	-0.14
	(0.16)	(0.10)	(0.08)	(0.12)
South America	-0.25	-0.24*	-0.24**	-0.36**
	(0.15)	(0.11)	(0.09)	(0.13)
Middle East	-0.11	-0.20*	0.05	-0.27**
	(0.14)	(0.09)	(0.05)	(0.09)
Asia	-0.31*	-0.08	-0.05	0.07
	(0.14)	(0.11)	(0.05)	(0.11)
Oceania	-0.54**	-0.21+	-0.01	-0.08
	(0.15)	(0.13)	(0.07)	(0.13)
Europe	-0.39*	-0.26*	0.02	-0.09
	(0.15)	(0.11)	(0.09)	(0.15)
Constant	124.63**	60.59+	0.24	50.33
	(37.81)	(31.71)	(13.06)	(37.87)
Observations	4,665	4,665	4,665	4,665
Number of countries	173	173	173	173
R^2	0.05	0.08	0.46	0.25

Replications of Mansfield and Pevehouse 2006: table 2, model 1.1
OLS models with panel-corrected standard errors
Outcome variable is number of new IOs joined, $\Delta_{t,t-1}$
Period of observation: 1965–2000
Reference region is Africa

Panel corrected standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Table S-3: IOs as signals of cooperative intentions

	IEA ratification			
	IX	X	XI	XII
Bernauer et al. IOs	0.011**			
	(0.004)			
Formal IOs		0.012**		
		(0.004)		
Informal IOs			-0.001	
			(0.007)	
Total IOs				0.007*
				(0.003)
Trade openness	-0.125*	-0.124*	-0.032	-0.111+
	(0.054)	(0.053)	(0.049)	(0.057)
Polity	0.010+	0.011+	0.016**	0.011+
	(0.006)	(0.006)	(0.006)	(0.006)
GDP per capita (log)	0.931	0.940	0.426	0.944
	(0.617)	(0.616)	(0.655)	(0.639)
GDP per capita (log, squared)	-0.039	-0.040	-0.011	-0.041
	(0.037)	(0.037)	(0.040)	(0.039)
SO_2 per capita	0.090**	0.089**	0.052	0.088*
	(0.034)	(0.033)	(0.035)	(0.035)
Number of other countries ratified	0.023**	0.023**	0.022**	0.023**
	(0.002)	(0.002)	(0.002)	(0.002)
Share same income group that ratified	0.000	0.000	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)
Share same region that ratified	0.030**	0.030**	0.031**	0.031**
	(0.002)	(0.002)	(0.002)	(0.002)
GDP (log)	-0.073	-0.072	0.064	-0.050
	(0.070)	(0.069)	(0.060)	(0.073)
Africa	-0.506**	-0.514**	-0.417**	-0.447**
	(0.147)	(0.147)	(0.158)	(0.149)
North America	-0.547**	-0.520**	-0.703**	-0.594**
	(0.158)	(0.169)	(0.190)	(0.176)
Latin America	-0.543**	-0.552**	-0.477**	-0.523**
	(0.124)	(0.125)	(0.129)	(0.125)
East Asia	-0.461**	-0.445**	-0.692**	-0.501**
	(0.140)	(0.143)	(0.166)	(0.145)
West Asia	-0.713**	-0.718**	-0.798**	-0.705**
	(0.159)	(0.158)	(0.167)	(0.164)
Time	-0.328**	-0.328**	-0.329**	-0.329**
	(0.017)	(0.017)	(0.017)	(0.017)
$Time^2$	0.010**	0.010**	0.010**	0.010**
	(0.001)	(0.001)	(0.001)	(0.001)
$Time^3$	-0.000**	-0.000**	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-9.394**	-9.433**	-8.281**	-9.563**
	(2.970)	(2.971)	(3.110)	(3.022)
Observations	574,196	574,196	574,196	574,196
Number of countries	156	156	156	156

Log likelihood	-27208	-27205	-27257	-27227
Pseudo R^2	0.197	0.197	0.195	0.196

Replications of Bernauer et al. 2010: table 3, model 2
Logistic regression with cubic time polynomials
Outcome variable: country *i* ratification of treaty *j* in year *t*
Unit of observation: country-treaty-year, 1950–2000
Robust standard errors clustered by country
** p<0.01, * p<0.05, + p<0.1