

Interplay: Exploring Institutional Interaction

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Introduction

Since the development of the Institutional Dimensions of Global Environmental Change (IDGEC) Science Plan in 1998 (Young et al. 1999/2005), institutional interaction has become an important subject of inquiry. The Science Plan put institutional interaction on the agenda of global change research when only a handful of scholars had raised the general issue. Their work drew attention to the risk of “treaty congestion” (Brown Weiss 1993, 679) and to an increasing “regime density” (Young 1996, 1) in the international system. Today it is widely recognized that “the effectiveness of specific institutions often depends not only on their own features but also on their interactions with other institutions” (Young et al. 1999/2005, 60). Many environmental issue areas are cogoverned by several international institutions with governance also involving institutions at lower levels of societal and administrative organization (regional, national, local) (Young 2002b, 83–138).¹

Although research on institutional interaction is closely related to the study of the effectiveness of international institutions, it takes a distinct perspective and transcends the focus on individual institutions. Institutional interaction is part of the broader consequences of international institutions occurring beyond their own domains (Underdal and Young 2004). Exploration of such interaction supplements the traditional inquiry into the establishment, development, and effectiveness of individual international institutions. Focus turns to the relationship among institutions, however, whereas traditional institutional research addresses the relationship between actors and institutions.

We have made important headway in knowledge about institutional interaction since the inception of IDGEC. The IDGEC Science Plan

identified three areas particularly worthy of research: the role of politics and political decision making and their relationship to functional linkages among different issue areas; specific types of interaction especially with respect to their significance for the performance of the institutions involved; and the exploration and characteristics of interaction as they create synergy or disruption among the institutions involved (Young et al. 1999/2005, 64–65). We show that through a huge expansion of both conceptual and empirical research, understanding especially of the second and third research areas has improved considerably. Although quantifying IDGEC's contribution to progress would prove elusive, IDGEC has without doubt provided an important focal point and inspiration for research on institutional interaction. Not least, it has provided an important forum for the coordination of research efforts and for the exchange of research results.

Our discussion of institutional interaction starts with a review of the empirical progress made as a result of the study of horizontal interaction among international institutions. Subsequently we examine the theoretical development and argue that we have made significant progress toward developing a theory of institutional interaction through the identification of a limited number of relevant causal mechanisms and ideal types. Next we introduce four principal strategies that have been employed in the exploration of institutional interaction. An analysis of the implications of institutional interaction for our understanding of international institutions and global environmental governance follows. The penultimate section explores the progress made in the specific research area of vertical interaction, which has largely developed separately from that of horizontal interaction. Finally, attention is turned to identifying a number of promising avenues for research on institutional interaction.

The Growth of Empirical Analyses

The number of empirical analyses of institutional interaction by both social scientists and lawyers has grown tremendously over the past decade. This work has confirmed the importance, ubiquity, and diversity of institutional interaction. Interinstitutional influence significantly affects the development and performance of virtually all institutions. Generally, the empirical research has focused on a limited number of "hot spots." A large potential exists for broadening the overall empirical coverage. Here we review progress in the most prominent areas of research.

The World Trade Organization and Multilateral Environmental Agreements

Trade-environment interactions are one of the "oldest" areas of relevant scientific inquiry. A number of trade-related multilateral environmental agreements (MEAs) have been found to interact with the World Trade Organization (WTO). MEAs concern, on the one hand, the regulation of international trade, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, and the Cartagena Protocol on Biosafety. On the other hand, MEAs, such as various fisheries agreements and the Montreal Protocol on Substances That Deplete the Ozone Layer, employ trade restrictions as an enforcement measure (e.g., Brack 2002; Eckersley 2004; Palmer, Chaytor, and Werksman 2006). Driven by the expansion of the world trade regime to cover, among other things, intellectual property rights and sanitary and phytosanitary measures, and by the emergence of further MEAs, the scope of trade-environment interactions has also expanded (e.g., Rosendal 2001a, 2006; Andersen 2002; Oberthür and Gehring 2006c; Chambers, Kim, and Young 2007).

Studies by social scientists and lawyers alike have highlighted the potential for conflict between the WTO and trade-related MEAs and have identified potential solutions. Contributions have especially drawn attention to the ways in which the WTO, backed by its comparatively strong dispute settlement mechanism, works against effective global environmental governance. The existing obligations under the WTO "chill" negotiations on MEAs because they constitute obstacles to agreement on environmental trade restrictions or limit the effectiveness of such restrictions (Brack 2002; Eckersley 2004). WTO obligations also undermine the effective implementation of MEAs by protecting free trade in goods irrespective of the environmental consequences of the underlying production processes. The identification of the conflicting areas has led to the analysis of various potential solutions, including mechanisms available in international law (Pauwelyn 2003) and options for institutional reform of the WTO (Tarasofsky 1997; Biermann 2001b).

More recent studies have investigated in more detail the response of MEAs to the influence of the WTO. This has led to the insight that MEAs are not as weak in this conflict as they might appear at first

glance. Trade-environment interactions are not a one-way street because MEAs have proved surprisingly robust in influencing the WTO. Despite the chilling effect of the WTO, more than twenty MEAs comprise trade measures to date. Their proponents have found, and used, the room for maneuver to adapt to the WTO requirements while still pursuing their objectives with trade measures. Among other things this has led to specific efforts to avoid discrimination against nonparties (Palmer, Chaytor, and Werksman 2006). The introduction of trade-restrictive measures adapted in this way has in turn restricted the WTO's regulatory scope and authority (e.g., Oberthür and Gehring 2006b) and has triggered adaptations on the side of the WTO to allow for resulting multilateral trade measures. This has produced increasing acceptance of appropriately designed MEA trade measures as reflected in the interpretation of the WTO regulations by the WTO Appellate Body and in the proceedings of the WTO Committee on Trade and Environment. As a result, no dispute concerning the implementation of an MEA has yet been brought before the dispute-settlement mechanism of the WTO (Charnovitz 1998; Palmer, Chaytor, and Werksman 2006, 187).

Overall these results indicate that the interaction between the WTO and MEAs is more balanced than some early analyses might have suggested. An increasing number of studies during the past decade have highlighted the achievements of MEAs in shaping the balance between trade and environment. The emerging picture is one of an increasingly institutionalized (and thus recognized) division of competences and labor between MEAs and the WTO (Gehring 2007). Certainly the current balance may not be sufficient or satisfactory, and tensions may worsen in the future based on the persisting societal conflict between free trade and environmental objectives. However, the latent interinstitutional conflict between the WTO and MEAs highlighted in many early analyses appears to have been managed relatively successfully so far, as the conflict has not become acute. If this observation can be further confirmed, it would provide an indication that the current decentralized management of institutional interaction has been more successful than traditionally assumed (see "Implications for Policy Making," below).

Climate Governance

The growing literature on institutional interaction in climate governance illustrates the particular multi-institutional nature of this governance area. The international climate change regime that is based on the UN

Framework Convention on Climate Change and its Kyoto Protocol has an enormous scope. As a result, it overlaps and interacts with a multitude of other issue areas and institutions in a variety of ways. In addition to the multifaceted and multi-institutional nature of international climate governance, the paramount importance of climate change on the international (environmental) agenda has contributed to the emergence of a rich literature on the wide-ranging interactions with various other environmental institutions and with institutions not primarily environment oriented.

A number of studies that have explored interactions among the international climate change regime and other MEAs have in particular highlighted the potential hegemony of climate governance over other environmental concerns. The objective of maximizing carbon uptake by monocultural forest plantations may, reinforced by the economic incentives built into the Kyoto Protocol, defeat the competing objective of preserving natural biodiversity-rich ecosystems under the Convention on Biological Diversity (Pontecorvo 1999; Jacquemont and Caparrós 2002). The climate change regime drove the adoption, in 2006, of an amendment of the London dumping convention that allows carbon sequestration in deep-sea deposits (International Maritime Organization 2006). Similarly, activities under the Kyoto Protocol's Clean Development Mechanism (CDM), which helps fund climate protection projects in developing countries, have been found potentially to clash with efforts to phase out ozone-depleting substances under the Montreal Protocol to protect the ozone layer (L. Schneider, Graichen, and Matz 2005). At the same time the Montreal Protocol has itself affected the Kyoto Protocol in various ways. On the positive side, the Montreal Protocol has informed the design of several aspects of the Kyoto Protocol and has contributed to climate protection by phasing out ozone-depleting substances (such as chlorofluorocarbons, CFCs) that are also powerful greenhouse gases. On the negative side it has led to a growing consumption of certain fluorinated greenhouse gases regulated under the Kyoto Protocol (Oberthür 2001). Interactions with further MEAs, such as the Convention to Combat Desertification and the Ramsar Convention on Wetlands, have been identified but not analyzed in detail (Oberthür 2006; van Asselt, Biermann, and Gupta 2004).

With respect to nonenvironmental institutions, most analyses have addressed interactions with economic institutions and, in particular, the WTO. In line with the traditional trade-environment debate, the WTO

compatibility of multilateral or unilateral trade measures as a means for climate protection has been explored (e.g., Charnovitz 2003; Biermann and Brohm 2005). In addition, the market mechanisms of the Kyoto Protocol, most notably emissions trading, provide a particular angle for the trade-environment debate. In this context the question arises whether and to what extent international trading rules apply to trading in emission units created by the climate change regime. Furthermore, the relevance of international trade and investment rules and financial institutions has become an issue, particularly with respect to the implementation of climate protection projects under the CDM and Joint Implementation schemes of the Kyoto Protocol (Chambers 1998, 2001). Beyond the core economic and financial institutions, the analysis of the interaction of the climate change regime with the International Civil Aviation Organization and the International Maritime Organization (IMO) in regard to greenhouse gas emissions from international transport has highlighted the difficulties that can arise from regulatory competition and a lack of coordination among international institutions (Oberthür 2003, 2006). Further interactions of the climate regime with nonenvironmental institutions, such as the World Health Organization, have received less attention (van Asselt, Biermann, and Gupta 2004).

Ocean Governance

Ocean governance is a third area that has attracted considerable scientific attention. The prominence of relevant research is first of all obvious from the aforementioned discussion of both the WTO/MEA interplay and institutional interaction in climate governance, because ocean-related issues play an important role in both areas (e.g., WTO and fisheries agreements; IMO and climate protection). In addition, studies have focused on various subsets of the large number of institutions that interact in manifold ways in this area of governance. The large number of studies exploring fisheries governance is particularly striking (e.g., Stokke 2001a; DeSombre 2005; Stokke and Coffey 2006).

Research has in particular focused on a number of pertinent issues. A first focus has been on the exploration of the interplay of various institutions in particular geographical areas of ocean governance. Related studies have shed light on the interplay of various functionally differentiated institutions in the governance of particular regions such as the North Sea (e.g., Skjærseth 2000, 2006), the Arctic (e.g., Stokke 2007; Stokke and Hønneland 2007), and Antarctica (e.g., Stokke and Vidas

1996). The aforementioned studies on regional areas of ocean governance have frequently also addressed the effects of the nesting of regional arrangements or functionally specialized institutions (e.g., fisheries agreements) into broader global institutions, most importantly the UN Convention on the Law of the Sea (Vidas 2000a, 2000b) and the UN Fish Stocks Agreement (e.g., Boyle 1999; Stokke 2000, 2001a). Yet another important research area has been the governance of particularly vulnerable marine species such as whales. In this regard it has turned out that the existence of numerous functionally specialized institutions creates opportunities for forum shopping that might be exploited by interested actors. For example, the protection of whales, usually pursued within the International Whaling Commission, might also be addressed under CITES (Gillespie 2002).

Other Areas of Empirical Research

Noteworthy are two particular contributions by legal scholars. First, they have begun to investigate the relationship and mutual influence of various courts and quasi-judicial procedures (e.g., Schiffman 1999; Shany 2003). A recent dispute between Ireland and the United Kingdom concerning the UK MOX plant in Sellafield has, for example, been addressed by procedures under the UN Convention on the Law of the Sea, the OSPAR Convention, and the European Court of Justice (Lavranos 2006). Formal rules on jurisdictional delimitation and more informal mechanisms (e.g., regarding information exchange) that minimize the risk of contradictory judgments and jurisdictional competition exist to some extent and could be further advanced to tackle these issues. Second, legal scholars have analyzed the consequences that norm conflicts may have in general for the system of international law as well as the means that are available in international law to resolve such conflicts (Pauwelyn 2003; Wolfrum and Matz 2003). The resulting legal analyses have highlighted that existing constitutional rules of international law, such as the *lex posterior* and the *lex specialis* rules reflected in the Vienna Convention on the Law of Treaties, are insufficient. The resolution of norm conflicts frequently has to resort to a case-by-case approach of clarifying the situation. As one result, many international treaties in international environmental governance explicitly address the relationship with other treaties (M. Axelrod 2006). Jurisdictional norm interpretation has also played an important role, for example, with respect to managing the tensions between the WTO and MEAs. In other cases a resolution

has to rely on the political rather than the jurisdictional process of norm development and interpretation.

Other areas of environmental governance with possible interaction effects have received far less scientific attention. Only rarely studies have touched upon aspects such as the regional-global interactions concerning the North-South transfer of hazardous waste (Meinke 2002) and have addressed European air pollution as an empirical field (Selin and Van-Deveer 2003). Given the fact that virtually all areas of environmental governance are influenced by several institutions, there is furthermore room for many more empirical analyses of institutional interaction to shed light, for instance, on the governance of chemicals or the protection of species and biodiversity. Even with respect to the WTO-MEA relationship, global climate governance, and ocean governance, there is an enormous scope for further interplay analyses. In none of these areas have existing studies yet provided a comprehensive picture of the problems and promises of interaction. Also, studies of large numbers of cases that could provide a basis for comparative analyses have so far remained rare. To our knowledge our own research is the only example of such a large-*n* study to date (Oberthür and Gehring 2006c), although some scholars have begun to investigate particular aspects of interaction by employing quantitative means (e.g., M. Axelrod 2006).

Synergy and Conflict

One of the most noteworthy results of recent empirical research concerns the relationship of synergy and conflict in the realm of institutional interaction. Whereas Keohane, Haas, and Levy (1993, 15–16) identified more interinstitutional synergy than they expected, early analyses of individual cases such as the relationship among the WTO and MEAs focused on conflict and supported the notion that institutional interaction is problematic. Evaluating 163 cases of environmentally relevant interaction, we found in our own study that synergy is, counter to frequent assumption, at least as common among international and European Union (EU) environmental governance institutions as disruption (Gehring and Oberthür 2006, 316–25). The majority of our cases of institutional interaction led to synergy, and only about a quarter resulted in clear disruption. Furthermore, disruption and conflict in most cases occur as unintended side effects rather than deliberate results. Undoubtedly conflict is not negligible and poses severe problems, especially in interaction

among environmental and nonenvironmental regimes; however, synergy dominates overall. Hence, the larger-*n* study points to a selection bias toward the conflictive, more politically salient cases.

Moreover, collective action is taken much more frequently in response to disruptive than to synergistic interaction. Positive effects of institutional interaction are commonly "consumed" without further action, irrespective of the potential for further improvement that may exist. This phenomenon appears to be widespread (identified in about 30 percent of our cases). A potential for improvement where positive effects occur has been neglected much more frequently than in the case of negative (disruptive) outcomes. The higher salience so far of problematic cases of interaction may be explained by the fact that people generally react more strongly to the risk of losses entailed in conflict than to the advantage of additional benefits (Tversky and Kahnemann 1981, 1984) and by the presence of aggrieved actors struggling for change. This suggests that it may be worth investing effort to identify potential for improvement irrespective of whether the original effect of an interaction was synergistic or disruptive.

These empirical findings have important implications for current debates about the reform of international environmental governance. These debates have been widely based on the assumption that conflict is the prevailing feature of institutional interaction. Concerns about disruptive interaction (between MEAs and the WTO as well as among environmental regimes themselves), incoherence, and duplication of work have been important drivers of both calls for a World Environment Organization (WEO) (e.g., Biermann and Bauer 2005) and more cautious bottom-up proposals for strengthening coherence and environmental policy integration in global environmental governance (e.g., Chambers and Green 2005; Najam, Papa, and Taiyab 2006). The aforementioned empirical results require a review of the basis for discussion of synergy and disruption and specifically suggest the need for more emphasis on preserving and enhancing synergistic institutional interaction as compared to minimizing interinstitutional conflict.

Conceptual Progress: From Classification to Causal Mechanisms

The IDGEC project has facilitated a number of attempts to develop general research concepts. Sound concepts are a prerequisite for more systematic research on institutional interaction. Starting in the mid 1990s,

the search for a reliable conceptual foundation for institutional interaction has moved from classification efforts to more general propositions about the driving forces of institutional interaction and the deductive identification of causal mechanisms, elucidating both the pathways through which influence can travel from one institution to another and the consequences of interaction.

Categories for the Classification of Institutional Interaction

The search for analytical concepts started with a number of categories for classification. These classifications are useful for a first-cut exploration of the field of institutional interaction and establish valuable distinctions. They do not, however, capture the forces driving interaction.

Preceding the IDGEC Science Plan, Young (1996) put forward four types of institutional interaction and began to explore their inherent dynamics. He observed that issue-specific regimes are usually *embedded* in overarching principles and practices, such as sovereignty, and that they trigger long-term processes of change in these overarching structures. Institutional *nesting* addresses instances of interaction in which specific arrangements are folded into broader institutional frameworks that deal with the same general issue area but are less detailed. An example is the nesting of the Multi-Fiber Agreement within the General Agreement on Tariffs and Trade (GATT)/WTO (Aggarwal 1983). In cases of institutional *clustering*, actors combine different governance arrangements in institutional packages even when there is no compelling functional need to do so, as occurred in the UN Convention on the Law of the Sea. Finally, *overlap* addresses linkages in which individual regimes formed for different purposes and largely without reference to one another intersect on a de facto basis, producing substantial impacts on each other in the process. Young drew attention to the fact that nesting and clustering are typically the result of intentional attempts to redesign the institutional landscape, whereas embeddedness and overlap reflect unintentional consequences of human action. In the preparatory stages of the Science Plan, King (1997) developed a taxonomy of different types of institutional interaction, which focused also on possible political responses to institutional interaction. Rosendal (2001a) conjectured, somewhat surprisingly, that interaction will create synergy, if the specific rules of the institutions involved are compatible, and conflict, if they prove to be incompatible, whereas the institutions' broader norms are less relevant. However, the development of general causal mechanisms of

institutional interaction demonstrated later on that the broader norms reflecting the policy direction of two or more institutions can have a tremendous impact on the quality of effects.

The IDGEC Science Plan proposed to distinguish between horizontal and vertical interaction (Young et al. 1999/2005; Young 2002b, 83–138). Horizontal interaction occurs among institutions at the same level of social organization or the same point on the administrative scale. At the international level this kind of interaction originates from the high degree of fragmentation of the international system in which actors frequently choose to pursue their common interests by establishing new institutions rather than expanding existing ones. By contrast, vertical interaction addresses the influence of institutions across different levels of social organization or administration. For example, the institutional design of domestic political systems shapes state interests and thus exerts influence on the design of international and European institutional arrangements (Héritier 1999). And global or regional environmental governance requires an appropriate institutional underpinning at the national and local levels (see Galaz et al., chapter 5 in this volume).

Most importantly, the Science Plan put forward the distinction between political and functional linkages among institutions (Young et al. 1999/2005, 50; see also Young 2002b, 23). Juxtaposing political and functional linkages provides an initial idea of some fundamental forces driving institutional interaction, namely, deliberate political action and underlying properties of the governance targets for international institutions that escape human control. A functional linkage was conceived of as a “fact of life,” “in the sense that the operation of one institution directly influences the effectiveness of another through some substantive connection of the activities involved” (Young et al. 1999/2005, 50). It would exist “when substantive problems that two or more institutions address are linked in biogeophysical or socioeconomic terms” (Young 2002b, 23; also 83–109). For example, action taken within the ozone regime on CFCs is immediately relevant for the climate change regime, because CFCs have ozone-depleting properties and are at the same time potent greenhouse gases. Political linkages, on the other hand, involve the deliberate design of the relationship between or among different institutions. They were believed to “arise when actors decide to consider two or more arrangements as parts of a larger institutional complex” (Young et al. 1999/2005, 50). For example, member states of the climate change regime assigned the operation of the financial mechanism of this

institution to the Global Environment Facility, thus establishing a permanent working relationship between the two institutions (Yamin and Depledge 2004, chapter 10). The distinction between functional and political linkages adapts the concepts of functional and political spillover from neofunctionalist integration theory (Rosamond 2000, 59–68).

This approach, however, is burdened with considerable analytical difficulties (see also Stokke 2001a). It underspecifies the realm of institutional interaction, because not all instances of institutional interaction fit either type: unavoidable fact of life or totally deliberate political design. Consider that the difficult relationship between trade-restricting MEAs and the WTO is neither deliberately designed by the member states of either of the institutions involved, nor is it an unavoidable fact of life because it originates from intended political action. The distinction also overspecifies the realm of institutional interaction because the two categories do not denote mutually exclusive types. Young et al. (1999/2005, 53) take the protocols on SO₂, NO_x, and volatile organic compounds of the international regime on transboundary air pollution as an example of a functional linkage, even though all these protocols belong to one convention managed under the UN Economic Commission for Europe and are thus undoubtedly parts of a larger institutional complex.

In addition to functional and political linkages, other types of interaction can be identified if a number of key factors believed to be crucial for the identification of causal pathways are systematically varied (Gehring and Oberthür 2004, 253–67). These factors shed light on different facets of an incident of institutional interaction relating to the causes and consequences of regime interaction, the nature of the influence at work, and the possible policy responses. Interaction can take place not only because institutions are functionally or politically linked, but also because they comprise different memberships, so that interaction occurs, for example, between a regional and a global institution operating in the same issue area. Interaction patterns can be expected to differ profoundly depending on whether or not a regime can unilaterally affect the development of another regime without the consent, or even awareness, of the actors operating within the target regime. Moreover, political action in response to observed or anticipated interaction can occur within either or all institutions involved.

Altogether the classifications of interaction illustrate the wide variety of possible paths of inquiry and serve as useful initial distinctions to structure the field. The distinction between horizontal and vertical inter-

action is, like the distinction between synergistic and conflictual qualities of effect among institutions, now well established. Young's four classes of institutional interaction provide an analytical framework for more specific inquiries; however, they have not been employed to analyze theoretically the causal factors behind institutional interaction.

Causal Mechanisms of Institutional Interaction

A number of authors set out to investigate the forces that drive institutional interaction and to identify general pathways clarifying how the institutions involved are related to each other. These attempts have yielded insights into how and under what conditions an international institution can influence another institution. Pointing to factors that might be important for causal analysis, these insights constitute a promising foundation for the search for theoretical models that elucidate the causes and effects of interplay between or among institutions.

In a series of studies on international resource management, Stokke (2001a; see also 2000, 2001b) proposed a set of four causal pathways through which institutional interaction may influence the effectiveness of the regimes involved. These pathways are derived from the major theoretical approaches of international relations. Hence, "ideational" interaction (originally referred to as "diffusive" interaction) relates to "processes of learning" (Stokke 2001a, 10) and implies that the substantive or operational rules of one institution serve as models for those negotiating another regime. This may, for example, help understand the rapid spread of general normative principles such as sustainability, precaution, and ecosystem management. "Normative" interaction refers to situations where the substantive or operational norms of one institution either contradict or validate those of another institution (e.g., in the case of the relationship of the WTO and MEAs). "Utilitarian" interaction relates to situations where decisions taken within one institution alter the costs and benefits of options available in another institution. Interaction "management," finally, relates to the political management of inter-institutional influence, including the deliberate coordination of activities under separate institutions in order to avoid normative conflict or wasteful duplication of programmatic efforts.

Against this backdrop a group of European collaborators developed a number of theoretically derived models of causal mechanisms and more specific ideal types of interaction that demonstrate how influence can travel from one institution to another (Oberthür and Gehring 2006a).

These models provide an account of how given causes create observed effects (Schelling 1998). They presuppose that one institution (the source institution) exerts influence through a particular pathway on the normative development or effectiveness of another institution (the target institution). Causal mechanisms open the black box of the cause-effect relationship between or among the institutions involved (Coleman 1990, 1–23; Hedström and Swedberg 1998, 21–23) and provide a microfoundation for the analysis of institutional interaction (George and Bennett 2005, 135–45).

The causal mechanisms approach suggests that institutional interaction is driven by one of four mutually exclusive general causal mechanisms covering three levels of effectiveness of governance institutions: namely, *output*—collective knowledge or norms prescribing, proscribing, or permitting behavior; *outcome*—behavioral change of relevant actors; and *impact*—the ultimate target of governance (Underdal 2004, 34, and chapter 2 in this volume). Two causal mechanisms are located at the output level and exert influence on the decision-making process of the target institution. A third causal mechanism is located at the outcome level, involving changes of behavior of relevant actors, while the fourth causal mechanism occurs at the impact level. The latter two mechanisms do not modify decision making of the target institution but rather its effectiveness within its issue area. The four causal mechanisms are believed to cover the full range of fundamental rationales that may drive institutional interaction. More specific ideal types are needed, however, to derive hypotheses about the conditions under which institutional interaction is expected to occur and its consequences for environmental governance.

Cognitive Interaction Institutional interaction can be driven by the power of knowledge and ideas. The causal mechanism of cognitive interaction is based purely on persuasion and may be conceived of as a particular form of interinstitutional learning (similarly Stokke 2001a, 10). If the rationality of actors is “bounded” because information-processing capacity is limited (Simon 1972; Keohane 1984, 100–115), or if relevant information is not entirely available, the actors will be prepared to adapt their preferences to new information (Checkel 1998; Risse 2000). The decision-making process of an international institution will be influenced if information, knowledge, and/or ideas (P. Haas 1992b) produced within the source institution modify the perception of decision makers oper-

ating within the target institution. For cognitive interaction to occur, the source institution must generate some new information, such as a report, revealing, for example, new scientific or technological insights or an institutional arrangement solving a particular regulatory problem, which is subsequently fed into the decision-making process of the target institution by an actor. The information must change the order of preferences of actors relevant to the target institution and in this way affects the collective negotiation process and the output of the target institution. Depending on whether an interaction was triggered intentionally or not, we can distinguish two ideal types of cognitive interaction.

If cognitive interaction is unintentionally triggered by the source institution, members of the target institution voluntarily use some aspect of the source institution as a policy model. For example, the compliance system under the Montreal Protocol on Substances that Deplete the Ozone Layer influenced the negotiations on the compliance system under the Kyoto Protocol on climate change because it provided a model of how to supervise implementation and deal with cases of possible non-compliance (Oberthür and Ott 1999, 215–22). This type of cognitive interaction can occur between any two institutions, because international institutions share a number of functional challenges related to monitoring, verification, enforcement, and decision making. Also, numerous types of actors may pick up the information or idea and feed it into the decision-making process of another institution. Learning from a policy model can generally be expected to strengthen the effectiveness of the target institution, because it presupposes that the members and subjects of the target institution collectively consider the model to be useful. Policy models, however, are frequently modified or adapted to ensure their fit with the particular needs of the target (“complex learning”; see E. Haas 1990). The policy-model type of interaction highlights how members of an institution can improve the effectiveness of their governance efforts through the cognitive interaction involved in learning from other institutions.

If cognitive interaction is intentionally triggered by the source institution, it takes the form of a request by the source institution for assistance from the target institution. For example, the World Customs Organization adapted its customs codes in response to a request by CITES, thus supporting the implementation and enforcement of the latter’s trade restrictions (Lanchbery 2006). A request for assistance requires that the issue areas involved overlap, because adaptation by the target institution

would otherwise be meaningless for the source institution. Moreover, it will usually be successful only if the requested adaptation is either beneficial for, or at least indifferent to, the effectiveness of the target institution. Members of an institution cannot be expected to act upon external requests that harm their own institution. Whereas a successful request for assistance will generally produce synergistic or at least neutral effects for the target institution, it is intended to create a positive feedback effect on the source institution. Intentional cognitive interaction enables an institution to draw on other institutions in order to enhance its own effectiveness, even if it cannot exert pressure on the target institution to adapt its rules. The result is an instrument for furthering effective international governance.

Interaction through Commitment Normative commitments may also provide the power behind interaction based on the premise that international obligations create at least some binding force on those they address. For this form of interaction to occur, an institution must adopt a prescription or proscription that formally or informally commits its member states. Subsequently this commitment must affect the preferences and negotiating behavior of these actors in another institution, a target institution, in ways that influence that institution's collective decision-making process and output. For example, the WTO commitment not to discriminate against imported goods renders it more difficult for WTO members to adopt trade sanctions within MEAs that would reinforce the effectiveness of these institutions (Brack 2002). Activation of this causal mechanism requires that both memberships and issue areas overlap at least partially. Without overlapping memberships, no member state of the target institution would be committed to obligations established under the source institution. And without overlapping issue areas, commitments established under one institution could not redefine preferences related to issues dealt with under the other institution.

If the membership of one institution forms part of the membership of another institution, a formally independent institution is "nested" in another institution with similar objectives and governance instruments. Interaction between nested institutions constitutes a mechanism for policy diffusion within the same policy field and creates synergies among the institutions involved. It is typically easier to reach agreement within a smaller (e.g., regional) than in a larger (e.g., global) institution (Snidal 1994). States committed within the smaller institution may develop a

common interest in transferring their obligations to the larger institution governing the same issue area. For example, the ban of trade in hazardous wastes was more easily reached in a number of regional agreements than in the global Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, but the latter was subsequently heavily influenced by the regional agreements governing the same issue area (Clapp 1994). Interaction between nested institutions provides opportunities for "forum shopping" (exploration by actors of opportunities offered by different institutions to pursue their own interests). Its underlying rationale suggests that it will largely support the effectiveness of the target institution and occasionally also of the source institution. The identical objectives of the institutions generate compatible priorities and render disruptive effects highly improbable, if not impossible.

If a group of states addresses the same issues within two institutions pursuing different objectives, interaction through commitment creates mutual disruption of the institutions involved and, therefore, a demand for the delimitation of jurisdictions. Typically, institutions with different objectives will appraise a policy measure differently, so that disputes about the appropriate regulation arise. Environmentally motivated trade restrictions may be appraised as undesirable obstacles to free trade or as desirable instruments supporting environmental cooperation. In situations of this type, the members of the institutions involved possess a general interest in some sort of separation of jurisdictions in order to avoid fruitless regulatory competition; however, conflicting preferences regarding the appropriate solution make it notoriously difficult to solve such problems. Jurisdictional delimitation cases pose the governance challenge of identifying measures honoring the basic objectives of both institutions involved. This does not necessarily require an overarching institutional structure but may be achieved through mutual adjustment of institutional structures or even through careful implementation of obligations by the addressees.

If a group of actors pursues the same objectives within institutions controlling different governance instruments, interaction through commitment will produce synergistic effects because it activates an additional means. Such interaction occurs in two stages. First, actors committed under one institution transfer an obligation to another institution. Second, incorporation of the transferred obligation must mobilize an additional governance instrument, such as a particular form of law or a specific

enforcement or assistance mechanism that provides an additional incentive to implement the obligation. For example, political agreement achieved at the high-level International North Sea Conferences paved the way for the acceptance of identical obligations enshrined in hard law within the regime for the protection of the North-East Atlantic (OSPAR) (Skjærseth 2006). Such interaction will regularly raise the effectiveness of both institutions involved, because the additional governance instrument benefits the implementation of both institutions simultaneously.

Behavioral Interaction Institutional interaction may also be based on the interconnectedness of behavior across the domains of institutions. Behavioral interaction will occur if behavioral changes triggered by the source institution become relevant for the implementation of the target institution. This form of interaction is located at the outcome level and affects the performance of an international institution within its own domain. Relevant states and/or nonstate actors must adapt their behavior in response to the output produced by the source institution. The behavioral changes must affect implementation behavior under the target institution in ways that are relevant for the target institution's effectiveness. If the Kyoto Protocol, for example, creates incentives to plant fast-growing trees in ways that encroach upon biodiversity, this undermines the performance of the Convention on Biological Diversity (Jacquemont and Caparrós 2002). Behavioral interaction requires that the issue areas governed by the institutions involved as well as the direct and indirect addressees of institutional obligations are close enough to matter to each other. It does not depend on a collective decision within the target institution, because it occurs as the aggregate result of the behavior of actors operating within the two issue areas involved.

Implications of behavioral interaction for global governance depend, again, on whether the institutions involved differ predominantly in their memberships, objectives, or governance instruments. If different (usually overlapping) groups of actors address a given set of issues within institutions with similar objectives, behavioral interaction will always create synergy. Because of the matching objectives, behavioral changes will automatically benefit both institutions. If a group of actors addresses a set of issues within two institutions that pursue different objectives, interaction will tend to result in disruption of the target institution, because behavioral changes triggered by the source institution are easily at odds

with the objectives of the target institution and may thus undermine the latter's performance.

Impact-Level Interaction Institutional interaction may also rest on the interdependence of the ultimate governance targets of the institutions involved. In impact-level interaction the ultimate governance target of one institution, such as economic growth or the ozone layer, is directly influenced by side effects originating from the ultimate governance target of another institution. Consider a stylized example: as cod eat herring, successful protection of cod by one institution, resulting in a growing population of this species, will unintentionally decrease the population of herring protected by another institution. In contrast to behavioral interaction, interinstitutional influence in this case does not depend on any action within the target institution or its domain but rests on the "functional linkage" (Young 2002b, 23, 83–109) of the ultimate governance targets of the institutions involved at the impact level. It is increased population of cod, not human behavior, that leads directly to a decreasing population of herring. While impact-level interaction may rely on stable interdependencies of the biophysical environment, as with cod and herring, functional linkages may themselves be subject to possible long-term change. For example, economic growth promoted by the WTO and the resulting growth in international transport currently lead to increased emissions of greenhouse gases, thus undermining the effectiveness of the global climate regime. This kind of functional interdependence, however, might one day be overcome by technical progress or changes in production methods.

The value added by the general causal mechanisms and their subtypes is twofold. First, the models provide a promising foundation for the development of an elaborated theory of institutional interaction. They allow for the formulation of meaningful hypotheses about the preconditions for institutional interaction and in regard to the effects of interaction for global environmental governance. Second, they provide analytical tools for use in structured analysis of empirical interaction cases, which can help explain how influence travels from one institution to another as well as which groups of actors might be involved in this process. Such models, however, do not replace the empirical exploration of existing interaction cases. They do not relieve the researcher from establishing the causal relationship between the (potentially) interacting

institutions and exploring alternative causal pathways. Moreover, they do not provide precise descriptions of all properties of relevant interaction cases. Being deductively derived, they cannot be empirically right or wrong (Snidal 1985). Like game-theoretic models, they reflect the relevant components of the different causal pathways that a case of interaction may follow and thereby assist the empirical analysis of real-world situations.

Principal Research Strategies on Institutional Interaction

Research on institutional interaction adopts different perspectives. The new field of inquiry has not yet produced one or more standard approaches. Meaningful studies on institutional interaction, like research on any other subject of the social sciences, have to be founded on some basic assumptions about the dependent and independent variables and their relationship. Choices made in this respect influence the research questions that can be pursued in a particular study.

Explicitly or implicitly, research design on institutional interaction has to be based on decisions about the role of actors and institutions. Systemic approaches address the causal relationship among institutions so that both the dependent and the independent variables are located at the macro level of institutions, rather than the micro level of actors. Many studies of institutional interaction, including many legal analyses of overlapping and conflicting jurisdictions, focus entirely on the systemic level and bracket the activities of actors. In contrast, actor-centered research strategies address actors either as the independent variable or the dependent variable, locating the other variable at the macro level of institutions. Relevant research may start from a given interest of one or more relevant actors and explore the opportunities to exploit institutional interaction as an instrument to pursue these interests effectively (forum shopping). Alternatively, it may focus on the undesired side effects of institutional interaction that actors must take into account when establishing or redesigning a given institution. The exploration of the effects originating from institutional interaction and regime complexes (Raustiala and Victor 2004) on the behavior of relevant states and non-state actors also reflects an actor-centered strategy.

Research on institutional interaction can also focus on different units of analysis. It may focus on specific dyadic cases of interinstitutional influence in which one institution affects the normative development or

performance of another institution (Oberthür and Gehring 2006a, 26–31). This perspective may require the decomposition of complex interaction situations. Even a comparatively narrow interaction situation like the interplay between the WTO and MEAs with trade restrictions may turn out to be composed of several component cases running in different directions and passing through different causal mechanisms (Palmer, Chaytor, and Werksman 2006). Research, however, may also take as its unit of analysis the overall patterns emerging from complex interaction situations, which might involve several institutions and possibly many individual cases of interaction. It will then seek to develop an integrated view on a complex phenomenon like the relationship between MEAs and the WTO or the institutional setting affecting the Antarctic environment (Young 1996). This approach has therefore been called integrationist (Young 2007).

Squaring these two dimensions, we get four different research strategies. Each of them is particularly well suited to address certain research questions and ignore others. Table 6.1 illustrates the four strategies and indicates their core research question.

Table 6.1

Key research questions of different perspectives on institutional interaction

		Unit of analysis	
		Case of interaction	Complex interaction setting
Level of analysis	Systemic	<p>I.</p> <p>How, and with what effects, does an international institution influence another international institution?</p>	<p>II.</p> <p>How, and with what effects, does an institutional interaction affect the institutional structure of the international system?</p>
	Actor-centered	<p>III.</p> <p>How can and do actors exploit opportunities arising from institutional interaction or avoid undesired interaction effects? How does institutional interaction frame policy choices of actors?</p>	<p>IV.</p> <p>How, and with what effects, do actors change the institutional structure of the international system through institutional interaction?</p>

Inquiries located at the system level and focusing on one or more specific cases of interaction (cell I) address the core question of how, and with what effects, an international institution can and does influence another international institution. The focus is on institutional interaction effects rather than on actors' behavioral changes. The combination of a systemic perspective with a case-oriented approach is particularly well suited for rigorous analysis of the causal mechanisms and effects of specific incidents of institutional interaction. Causal analysis requires identifying a clear direction of causal influence running from one institution to another, which is difficult in complex situations in which the origins and targets of influence are not readily discernible or in which feedback effects occur. This research strategy has so far proved particularly popular and has supported significant theoretical development reflected in the determination of causal mechanisms and more specific ideal types driving cases of interaction (see "Causal Mechanisms of Institutional Interaction" above). Empirical studies of institutional interaction (as explored above in "The Growth of Empirical Analyses") have also (implicitly) employed this strategy. Likewise, studies analyzing the specific legal implications of one sectoral legal system for the *interpretation* of another one usually follow this research strategy (Wolfrum and Matz 2003).

Systemic inquiries exploring complex interaction settings (cell II) tackle the core question of how, and with what effects, institutional interaction affects the institutional structure of the international system. Because of the complexity of the empirical subject of inquiry, this research strategy will frequently start from empirical observation and description of complex settings or with a classification of interaction patterns. In contrast to case-specific research, it stays closer to the actual appearances of real-world interaction patterns, but it may be limited in its analytical grip on the forces generating the observed effects. Both conceptual work and empirical work employing this research strategy are still rare. The taxonomy of four different types of interaction put forward by Oran Young (1996; and see "Categories for the Classification of Institutional Interaction" above) and the analysis of the emerging division of labor between the WTO and MEAs with trade restrictions (Gehring 2007) provide tentative examples for this approach.

The study of specific cases of institutional interaction using an actor-centered approach (cell III) examines how interested actors can and do seek to exploit opportunities arising from institutional interaction or to avoid undesired interaction effects. In contrast to research falling into

cells I and II, this strategy allows the application of existing theoretical and methodological tools for the analysis of collective-action problems to the issue of institutional interaction. Interaction effects are treated like any other effects originating from an international institution. This research strategy is particularly well suited for exploration of the ways in which actors deal strategically with expected or anticipated institutional interaction in specific situations and how they exploit related opportunities for forum shopping. For example, Skjærseth, Stokke, and Wettestad (2006) examined how actors interested in enhancing the effectiveness of North Sea pollution control established the North Sea Conferences to exert influence on the existing Oslo-Paris Commission. M. Axelrod (2006) investigated actions of interested actors to protect the WTO agreements from undesired interaction effects originating from the newly negotiated Cartagena Protocol on Biosafety. Likewise, studies assessing the options for improving an interaction situation generally follow this research strategy (e.g., Biermann 2001b; Oberthür 2001; L. Schneider, Graichen, and Matz 2005).

Actor-centered studies focusing on more complex interaction patterns (cell IV) seek to investigate how the efforts of actors to employ institutional interaction change the institutional structure of the international system. They reflect that all institutional structures originate from interdependent human action and affect human behavior. Studies following this research strategy, however, must bridge a particularly wide gap between actors and institutions. The institutional structures of the international system emerging from institutional interaction are only an indirect consequence of human action that feeds into institutional interaction. Thus, cell IV research almost inevitably includes aspects of cell III and cell I research. Raustiala and Victor (2004) partly adopted this strategy in their study on the regime complex for plant genetic resources when examining the overall implications of postnegotiation implementation decisions adopted within international institutions dealing with legal inconsistencies of the normative systems involved. Their study demonstrates that this research strategy may imply going beyond a traditional understanding of institutions as resulting from the rational design of actors attempting to realize a common interest. Expanding traditional research on the effectiveness of institutions and studies exploring the combined effects of institutional complexes on the behavior of relevant states and nonstate actors also belong to this research strategy (Andersen 2008).

The choice among these research strategies depends primarily on the particular research interest. Although the combination of two or even more strategies in a single project is not excluded, it renders the construction of a reliable research concept more ambitious. Unless the different components are convincingly integrated, conceptual broadness may restrict analytical and theoretical depth. At the same time the different strategies are neither mutually exclusive nor antipodes. For example, research focusing on the exploration of individual cases of interaction (cells I and III) may well provide a sound basis for the exploration of complex interaction settings (cells II and IV). Likewise, cell III research will usually include insights from cell I inquiries. The research strategies therefore may well be employed in complementary ways.

Implications for the Understanding of International Institutions and Global Environmental Governance

What are the implications of the progress made in knowledge about institutional interaction for the understanding of governance institutions? What insights can be derived for policy making?

Understanding International Institutions

The study of international governance institutions has been dominated by the collective-action approach. This approach focuses almost exclusively on formal international institutions (Keohane 1993) and their rational design against the backdrop of well-defined preferences and constellations of interests of relevant actors (Koremenos, Lipson, and Snidal 2001). These institutions fulfill auxiliary functions depending on the characteristics of the underlying socially problematic situation (Oye 1985). In prisoner's dilemma situations, for example, institutions serve to define what is collectively considered as cooperation and as defection to produce transparency about the cooperators' behavior, and—possibly—to organize sanctions in order to preclude free riding and stabilize cooperation (Martin 1993). The collective-action approach implies a top-down perspective where actors implement valid regime rules (unless free riding occurs). The research on the effectiveness of international environmental governance adopts a stimulus–response perspective (Miles et al. 2002).

By comparison, in the social practices perspective, institutions are seen as reflecting social expectations of appropriate behavior and as shaping

actors' preferences and identities (Young 2002b, 31–32). Institutions constitute social practices that are not collectively decided upon, nor formally established, but produced, reproduced, and changed in a permanent interaction process of relevant actors (Wendt 1987). If actors behave according to existing practices, they will reproduce them. If actors deviate from these practices, they will contribute to their modification or breakdown. Hence, social practices reflect “spontaneous” institutions that emerge from action (Young 1982a), whereas formal institutions and their “rational design” constitute but one among several ways to change an established social practice.

Important aspects of institutional interaction can better be grasped analytically by the social practices approach to institutions. If the normative structure of one institution is significantly influenced by other institutions, it cannot simply be traced back to existing preferences of relevant actors and the resulting constellation of interests. Two of the causal mechanisms uncovered (see “Causal Mechanisms of Institutional Interaction” above)—namely, cognitive interaction and interaction through commitment—demonstrate how actors' preferences regarding issues dealt with by one institution can be affected by another institution. Similarly, Raustiala and Victor (2004, 296) have pointed out that power, interests, and ideas do not map directly onto institutional decisions because they are also shaped by other institutions. At a minimum, institutional interaction, in addition to exogenous interests, thus significantly affects and shapes the preferences of actors. Accordingly, preference formation cannot easily be separated from institutional analysis.

Institutional interaction also creates new institutional structures that are difficult to design rationally, because they evolve gradually from, and are continuously shaped and reshaped by, numerous decentralized interaction occurrences. Interaction may lead to a particular division of labor of the institutions involved or to the mutual reinforcement of their effectiveness, as an emergent effect that is not reflected in either of these institutions. Such interlocking structures (Underdal and Young 2004, 374–75) do not arise from collective bargaining or institutionalized decision making at the aggregate level. Whereas virtually all institutions in international environmental governance comprise their own permanent decision-making centers, if only in the form of a conference of the parties, no such decision-making bodies exist with respect to interaction between international institutions. Although the EU and domestic political systems possess unitary institutional frameworks that can address related

issues, the international system lacks a similar capacity. To the extent that overarching institutions like the Vienna Convention on the Law of Treaties or the International Court of Justice exist, they play a limited role at best. Under these circumstances interaction emerges from, and is influenced by, decentralized decisions made within any of the institutions involved and the behavior of individual actors. Far from being designed, interaction thus evolves and is produced and reproduced through the practices of relevant actors.

If institutional interaction affects the implementation of obligations established under international institutions, it will modify the meaning of these obligations. The causal mechanism of behavioral interaction demonstrates how an institution can affect the effectiveness of another institution at the outcome level (see "Causal Mechanisms of Institutional Interaction" above). Even if the formal rules of the target institution remain unchanged, their effects and their meaning as reflected in the social practices of relevant actors change significantly. Similarly, Raustiala and Victor (2004, 302) suggest that interacting institutions may address legal inconsistencies by means of mutual adaptation during implementation. Whereas the collective-action approach assumes from a top-down perspective that actors implement fixed regime rules (unless free riding occurs), institutional interaction highlights that the social practices emerging in the implementation of one institution may also be shaped by other institutions. The top-down implementation perspective may thus provide a valuable first cut, but it does not encompass the effects of institutional interaction at the outcome level.

Implications for Policy Making

The progress of research on institutional interaction achieved so far has several implications for policy making. First, institutional interaction requires that policy making take into account the broader policy implications of particular governance projects. Research of the past decade has demonstrated the importance of interinstitutional effects at all three levels of effectiveness: output, outcome, and impact. It is now established that environmental governance is frequently the result of several institutions and that an institution often has implications for other institutions. Skillful policy making will have to consider the existence of several institutions cogoverning an issue area. Accordingly, the institutional environment of the institution in which a policy initiative is launched will most likely have repercussions for its prospects of success

regarding acceptance by other actors and effective implementation. And vice versa: the assessment of the impact of a policy initiative on an institution should take into account "side effects" on and from other institutions.

While to some extent constraining policy making, institutional interaction offers a wealth of new opportunities. Since the normative development of an institution can be influenced not only from within that institution but also by other institutions, actors may engage in forum shopping (Gillespie 2002; Raustiala and Victor 2004, 299–300). To the extent that issue areas overlap, actors can choose the most suitable institution for a policy initiative. They can develop integrated strategies for the pursuit of their preferences that take into consideration the potential of the varying institutions affecting an issue area for both norm making and implementation. Interested actors might even establish a new institution with the sole purpose of influencing an existing one, as the North Sea riparian states did with the establishment of the International North Sea Conferences directed at strengthening the existing OSPAR Commission (Skjærseth 2006). Moreover, they may create "strategic inconsistency" (Raustiala and Victor 2004, 301), causing disruption of an unwanted institution or regulation in order to increase the pressure for its revision or cancellation.

The research results have important implications for discussion about the reform of international environmental governance and the political management of institutional interaction. This discussion has so far focused mainly on the potential for institutional coordination and integration at the international level, most importantly by establishing a WEO (Biermann and Bauer 2005; Chambers and Green 2005; Najam, Papa, and Taiyab 2006). Findings of research on institutional interaction challenge this debate in several ways.

First, synergy among institutions has been found to be at least as common as disruption (see "Synergy and Conflict" above). This finding contradicts the presumption of most contributions to the debate on reforming international environmental governance that institutional interaction might primarily constitute a problem because it creates interinstitutional conflict and tension. If this presumption is revised, both the rationale for reform proposals and the yardstick for assessing their effectiveness need to be adapted. In particular, institutional reform proposals will have to demonstrate that they can, in addition to mitigating conflict, preserve and enhance synergy among institutions.

Second, institutional interaction research suggests that the institutional fragmentation of international environmental governance may constitute a strength rather than a weakness. Institutions with large regulatory overlaps appear to create substantial added benefit if they employ complementary governance instruments, represent different memberships, or provide for significantly different decision-making procedures. What may at first sight appear as a "duplication of work" or "redundancy" arising from institutional fragmentation, which is commonly deplored by policy makers and in the relevant literature, is in fact frequently a sign of effective governance. Slight differences in the instruments or procedures employed or the memberships of the institutions can make two (or more) institutions contribute in complementary ways to effective governance, as is best illustrated in the ideal type of interaction activating an "additional means" (see "Causal Mechanisms of Institutional Interaction" above). Regulatory competition among different forums can help prevent institutional sclerosis and provide an important driver of overall progress. Before pursuing a reduction of seeming "duplication of work," for instance, through a WEO or through the clustering of functionally related institutions or elements of institutions in global environmental governance (Oberthür 2002; von Moltke 2005), policy makers and analysts would be well advised to check carefully the "hidden" added value of the current fragmented arrangements.

Third, research indicates that disruption among international institutions is mainly rooted in competing institutional objectives, as is apparent in the jurisdictional delimitation type of interaction through commitment and the corollary type of behavioral interaction (see "Causal Mechanisms of Institutional Interaction" above). Accordingly, reform proposals would have to show how they promise to mitigate and minimize interinstitutional disruption and to reconcile diverging objectives of the institutions involved. For example, building a unitary institutional framework in the form of a WEO does not as such promise to resolve the trade-off between the competing environmental objectives of climate change and the protection of biodiversity regarding forest management. It would also require further clarification of how a WEO or other reform proposals would help mediate trade-offs with nonenvironmental objectives pursued by institutions such as the WTO.

Finally, recent research results challenge the conventional wisdom of the hegemony of the WTO vis-à-vis MEAs. The jurisdictional delimita-

tion type of interaction demonstrates that power is involved when it comes to defining the division of labor among institutions with competing objectives. Environmental institutions have proved remarkably strong in comparison with the WTO. Several environmental institutions have successfully created "strategic inconsistency" by regulating particular areas of international trade as such or employing trade measures as an enforcement tool. As a result they have limited the implications of the existing free-trade rules and have carved out certain areas of the regulatory authority of the WTO (see "The World Trade Organization and Multilateral Environmental Agreements" above).

Future research on institutional interaction holds the promise of further valuable input to policy debates. In particular, knowledge about effective interaction management has remained sharply limited to date. As research on institutional interaction advances, it could provide a more solid basis for exploring options for such management.

Vertical Interaction

Frequently environmental governance involves institutions located at different levels of social or administrative organization, most importantly the international, the national, and the local levels. This creates a vertical dimension of institutional interaction as identified in the IDGEC Science Plan (Young et al. 1999/2005) as well as in related publications (Young 2002b). Vertical interaction has been studied almost entirely separately from horizontal interaction, although this separation may be predominantly the result of research interests and scholarly discourses rather than theoretical considerations. The causal mechanisms discussed above may turn out to provide an instrument for the theoretical integration of the two perspectives.

Studies on the vertical interaction between the national and the local levels draw upon and expand the discussion on the preservation of the local commons. The "tragedy of local commons" (Ostrom et al. 2002; also Ostrom 1990) and the social problems of local communities trying to establish reliable institutional solutions for the management and preservation of commons such as water resources or common fishing grounds through self-organization have been studied for a long time. Case studies treat national measures such as the introduction of property rights that were found to interfere with local solutions as undesired external factors. The vertical-interaction perspective addresses such

interference as interaction between local and national institutions (Young 2002c, 266–76). As in the case of horizontal interaction, vertical interaction can be disruptive or synergistic, and authors have been primarily preoccupied with cases of disruption, mainly of well-operating local institutions by national institutions. In many cases national political institutions resulting in centralization of decision making, nationalization of resources, increased participation in markets, and priority for development policies have indeed been found to affect established local institutions adversely and to lead to the degradation of the local commons that had been effectively preserved in the past (Lebel 2005). In the face also of the “tragedy of the commons,” with its implication of incentives for free riding, local communities nevertheless may also benefit from support of institutions located at a higher level of social organization (Berkes 2006b). Intervention by national institutions is reported to strengthen or rejuvenate local-level institutions, for example, by state recognition of local institutions, development of enabling legislation, cultural revitalization, capacity building, and local institution building (see Berkes 2002, 296–300).

Although the literature has so far predominantly focused on the top-down influence of national on local institutions, vertical interaction conceptually covers a broader realm. It broadens the research agenda to encompass interinstitutional influences of all sorts across all levels of social and administrative organization. For example, national political systems may both benefit from and be harmed by regional or global institutions.

Vertical-interaction research is particularly related to the issue of scale (Gupta, chapter 7 in this volume) but should not be confused with it. Determining the appropriate level of institutional action stays central to the discussion of the appropriate “scaling” of an environmental problem (Young 2002b; Cash et al. 2006). The issue of scale raises concerns of effectiveness (at which level is a problem to be addressed to be solved effectively?) as well as power and interest (at which level do particular actors want it to be dealt with?). Although the lower levels of social organization may be closer to the environmental targets and the related human activities, effective solutions of many problems require cooperation at higher levels of social organization. In any event, scaling must not be conflated with vertical interaction. Even if the scaling up of an issue to a higher level of social and administrative organization will

almost inevitably cause vertical interaction between or among institutions located at different levels, vertical interaction addresses the distinct issue of interinstitutional influence.

Institutionalized comanagement has been the preferred solution to conflictual interaction between national and local institutions identified in the literature. The primary solution observed by researchers for the management or mitigation of such conflicts involves comanagement initiatives with formal power sharing. Many comanagement arrangements, sometimes including stakeholder bodies, exist in the areas of fisheries, wildlife, protected areas, forests, and other resources in various parts of the world. They range from joint forest management in India to the implementation of aboriginal resource rights in the United States, Canada, New Zealand, and Australia (Berkes 2002, 301–7). From a more conceptual perspective, possible solutions that do not rely on comanagement have received less attention. These include the gradual separation of the jurisdictions of the institutions involved, their merger, or the dominance of one of the interacting institutions (Young 2006). It is not clear, however, whether, or under which conditions, the effects of these solutions are malign or benign for environmental protection.

Interactions between or among local and national institutions dominate the discussion. Vertical interaction at higher levels of social organization occurs particularly between the national and the international levels (Young 2002c, 276–83). Independently from the relatively new framework of vertical interaction, the bottom-up influence exerted by domestic political systems on the shape and development of international institutions has been addressed under the “cooperation under anarchy” heading (Keohane 1984; Oye 1985). This perspective holds that opportunities for cooperation depend on the constellation of interests of the actors involved. Although states are here conceptualized as unitary actors whose interests may be shaped by national-level institutions, they constitute group actors that are, in fact, themselves institutions. Research on policy making within the EU revealed that national administrations frequently seek to establish their own domestically institutionalized solutions within the higher-level institution (Héritier, Knill, and Mingers 1996). The influence of international institutions on national political systems and institutions had also been intensely discussed long before issues of interaction appeared on the agenda (Chayes and Chayes 1993; Cowles 2001). The implementation of international rules has been found

to depend not least on the compatibility of international commitments with domestic institutions (see Galaz et al., chapter 5 in this volume). It follows that the concept of multilevel governance becomes an applicable lens for examination of the increasingly dense interaction between the EU and the political systems of its member states (Hooghe and Marks 2003).

While research on vertical interaction is still at an early stage, components of a common analytical framework and research agenda are evolving. Existing studies have so far at best focused on limited numbers of cases of institutional interaction, and there is a lack of larger comparative studies. Efforts have been made, however, to reexamine existing case studies in a comparative manner in order to extract more abstract and conceptually founded insights. In particular, the demand for support of local institutions by institutions located at higher levels of social organization (Berkes 2006b) and existing institutional solutions for malign interaction problems have been assessed (Berkes 2002). Likewise, Young (2006) has made attempts to develop a comprehensive analytical framework addressing the relationships between or among the interacting institutions, their core differences, the causal mechanisms that drive vertical interaction, and the consequences of that interaction (see also Cash et al. 2006). Although this work will have to be expanded to develop a theory of vertical interaction, it provides a solid foundation for this endeavor.

Whereas very few links have been made between work on vertical and work on horizontal interaction, the two research areas overlap empirically. The two research communities have so far almost entirely ignored each other's activity. Neither our own approach toward horizontal interaction (Oberthür and Gehring 2006c) nor the most important conceptual contributions to vertical interaction (Berkes 2002; Cash et al. 2006; Young 2006) cite a single publication of the other domain. Likewise, Young (2002b) discusses horizontal and vertical interaction within his elaboration of the IDGEC Science Plan in two separate chapters. The *empirical* interest in vertical interaction overlaps, however, particularly where the focus centers on interplay between or among global and regional institutions. Our comparative study addressed the vertical relationship between the EU and international institutions (Coffey 2006) as well as between global and regional international institutions. Also, certain types of the causal mechanisms of interaction through commitment

and behavioral interaction are particularly relevant for this relationship (see “Causal Mechanisms of Institutional Interaction” above). Interaction among nested institutions and interaction activating an additional means are particularly prominent types of vertical interaction between international institutions and EU legal instruments. Obligations agreed at the EU level provide a solid foundation for EU leadership in international institutions so as to internationalize the EU standard, and implementation of international obligations into EU law activates the particular supranational enforcement powers of the EU, which supports compliance by EU member states (Gehring and Oberthür 2006). Other studies have explored vertical interactions between regional and global institutions in several areas of environmental governance (Stokke 2001a; Meinke 2002). Investigating from another angle, Berkes (2006b) discusses regional institutions for the protection of certain fish stocks as intermediaries between the global institutions and the national and local ones.

Despite some differences, there is no theoretical reason to believe that vertical interaction operates fundamentally differently from horizontal interaction. Institutions located at different levels of social organization are hierarchically ordered, with a local institution operating in the shadow of a national one and a national one in the shadow of an international one. In contrast, international institutions, especially those that interact horizontally, are usually formally established independently of each other. Formal (jurisdictional) hierarchy must not be conflated with influence *per se*, as is seen in the well-known resistance of local or national institutions to the implementation of higher-order commitments. Equally, the frequent formal independence of institutions in horizontal-interaction settings does not imply the absence of influence. Although the particularities of influence may differ considerably, vertical interaction may be expected to resemble horizontal interaction in many respects.

Accordingly, lessons may be drawn from one strand of research for the other. It may turn out, for example, that vertical interaction frequently runs in both directions, rather than predominantly targeting lower-level institutions. As has been found in research on scale, vertical interaction may also open opportunities for the deliberate choice of an appropriate level as a particular form of “forum shopping” (see Gupta, chapter 7 in this volume) if regulation at different levels of social and administrative organization becomes, to some degree, functionally equivalent.

Future Research Directions

Recent advances in knowledge about institutional interaction provide fertile ground for future research. As outlined, research on institutional interaction has made important headway over the past decade or so. Rather than exhausting the field, this progress enables us to identify a wealth of new research opportunities.

The Development of a Theory of Institutional Interaction

Theory development in this area has just begun. More reliable theoretical knowledge on important aspects of institutional interaction is needed. To be able to detect hidden instances of interaction and formulate reliable advice for policy makers requires a theory of the conditions under which institutions tend to influence each other's normative development or effectiveness. The existing theoretically derived causal mechanisms and their subtypes may provide a promising foundation for the development of an expanded theory of institutional interaction. For this purpose the concept needs to be enlarged and elaborated in at least two directions. First, the models do not yet contain reliable information about the sufficient conditions under which the respective causal mechanisms are triggered. Second, knowledge about the development of institutional interaction situations is waiting to be systematically developed. Do the actors involved tend toward full exploitation of the synergies inherent in a situation, or do such opportunities remain unexploited? Do actors succeed over time in minimizing or avoiding disruption among institutions with different objectives, or does conflict tend to prevail? The patterns of the many cases of institutional interaction that have as yet received little attention could also be more intensively studied.

Empirical Knowledge

Such knowledge is still largely lacking in a number of important areas of institutional interaction. First, as observed above, the majority of existing case studies on instances of institutional interaction has focused on a limited number of interaction settings, including the WTO-MEA interface, interactions involving the climate change regime, as well as issues related to the governance of the oceans and the broadly discussed foundation of a WEO. Effects of institutional interaction in other areas, such as governance of chemicals or the preservation of biodiversity, have

received far less attention. While analysis of interaction in these fields can use existing analytical tools, it might reveal yet unknown patterns of interaction and thus contribute to the progress of generalized institutional knowledge. Second, still very little is known about the significance of institutional interaction both generally and in specific cases. The efficient management of interaction situations depends on a more precise assessment of the significance of interaction effects. Finally, we need more comparative and large-*n* studies that allow systematic comparison of a smaller or larger number of interaction cases or situations. Such comparative studies promise to generate inductively generalized knowledge. Theoretical insights on such issues as the development of patterns of interaction situations can hardly be derived deductively. They must be founded on the systematic and comparative assessment, or even on quantitative studies, of an appropriate number of cases in a structured and focused manner.

Interaction Management

So far, interaction management remains underresearched. Besides a number of contributions looking into the general legal instruments available (e.g., Wolfrum and Matz 2003), the exploration of the kinds of policy responses that are, or could be, applied by actors in order to enhance synergy and mitigate or prevent conflict is still at its very beginning (van Asselt 2006). Perhaps surprisingly, relatively little is known about what policy responses various actors have applied at the various levels so far and how they have performed. More empirical research into existing policy responses and their performance over time may provide the most suitable starting point for thinking about further policy options for enhancing synergy and mitigating conflict as well as conditions for their successful implementation. The systematic assessment of interaction management (Stokke 2001a) will have to focus on different sorts of policy responses. Actors may respond unilaterally to institutional interaction issues in the implementation of institutional commitments. Members of one institution involved in an interaction situation may also collectively attempt to manage related challenges, as is evident in the ideal type of an interinstitutional request for assistance (see "Causal Mechanisms of Institutional Interaction" above). Actors may even strive for the coordination of interaction management in an overarching framework spanning several or all of the institutions involved in a certain situation (see also Gehring and Oberthür 2006, 314–16).

The management of impact-level interaction constitutes a particularly challenging task. This type of interaction addresses the functional interlinkage of the ultimate targets of the institutions involved. Whereas this interlinkage relies in some cases on barely modifiable biophysical facts, in other cases it may be subject to long-term change that might be influenced by skillful management. For example, environmental protection will in the long run depend not least on the successful decoupling of economic growth (the ultimate target of the WTO) from the global climate (the ultimate target of the climate change regime). Such management will have to occur at least partially outside these institutions and within one or more other institutions, fostering, for example, energy efficiency or the development of new technologies, or governing traffic.

Institutional Complexes and Broader Governance Structures

These wider topics have so far largely escaped theoretically guided research. Exploring systematically the nature, evolution, and consequences of sets of institutions that cogovern particular issue areas promises more integrated understanding (Raustiala and Victor 2004). Most important will be knowledge of the particular division of labor that develops over time among a number of institutions cogoverning an issue area or of institutions with overlapping issue areas. It is one thing to examine how the WTO affects relevant MEAs, or vice versa, and quite another to explore how the overlapping area of environmentally motivated trade restrictions is jointly governed by these institutions. Unlike the sector-specific institutions involved, such interlocking structures (Underdal and Young 2004) are not the product of more or less rational design, since they emerge tacitly from interaction among several international, regional, and even domestic institutions. Cases of interaction may form sequential chains so that an individual case gives rise to a subsequent case that feeds back on the original source institution or influences a third institution. Cases of interaction may also cluster around certain issues and institutions. In this way a number of institutions jointly address a particular problem and contribute to the effectiveness of governance of a certain area. Complex interaction situations raise the problem of “emergent” properties because they may be affected by so many cases of interaction in ways so unexpected that new properties emerge that are not inherent in the single cases. The analysis, then, of complex interactions could start with an assessment of the coexistence of the single-interaction cases involved (Gehring and Oberthür 2006, 358–67).

Future Research on Vertical Interaction

This dimension of interaction has to date received much less systematic attention than horizontal interaction. The theoretical exploration of the origins, types, and consequences of cases and instances of such interaction has only just begun. It is still largely based upon the secondary assessment of existing case studies. It would thus benefit from the systematic comparison of well-selected cases of vertical interaction across levels, including a comparison of cases linking the local to the national level with cases linking the local to the global level and cases linking the national to the global level. Eventually the aim would be to develop theoretical models of the causal mechanisms and types of interaction that reveal information not only on how causal influence is transferred, but also on the conditions of its occurrence and its consequences for environmental governance. Also needed are theoretically sound and empirically reliable conceptions of the different types of division of labor between or among institutions located at different levels of social organization as well as the implications for environmental governance. In some respects the study of vertical interaction might be advanced by employing, or adapting, the analytical tools developed in the area of horizontal interaction. The result could be a more encompassing theory of institutional interaction that accounts for both horizontal and vertical interaction.

We do not claim that this list of research topics is exhaustive. It is meant to identify a number of core avenues that future research efforts may travel in building on past research. Research in the indicated areas promises to advance not only our knowledge about institutional interaction as such but also our understanding of environmental governance more broadly.

Note

1. A diversity of terms can be found in the literature to denote the phenomena subsumed here under institutional interaction, including *interplay*, *linkage*, *inter-linkage*, *overlap*, and *interconnection* (see, e.g., Herr and Chia 1995; Stokke 2000; Young et al. 1999/2005; Young 2002b; Raustiala and Victor 2004; Young et al. 2008). We use the term *interaction* in this chapter.

Institutions and Environmental Change

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edited by Oran R. Young, Leslie A. King, and Heike
Schroeder

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