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Institutional Analysis of Rules-In-Form Coding Guidelines

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Abstract:

Institutions are the prescriptions that humans use to organize all forms of repetitive and structured interactions (Ostrom, 2005, p. 3). Regardless of the label by which they are referred, such as rules or norms, institutions are social constructions: they represent shared understandings of behavior among actors who recognize, follow, and enforce the prescriptions. This document outlines a series of coding methods that can be used to analyze institutions-in-form, such as those found in public policy documents - from administrative rules to constitutions. The method is inspired by, and builds upon, the conceptual foundations of Elinor and Vincent Ostroms Institutional Analysis and Development (IAD) framework (Kiser & Ostrom, 1982; Ostrom, 2005) and the grammar of institutions (ADICO) (Crawford and Ostrom 1995). This coding manual also represents an update of the Formal Institutional Analysis Coding Guidelines provided by Siddiki, Weible, Basurto, and Carter in 2011.

Keywords:

Institutional grammar, ADICO/ABDICO, institutional analysis, coding, rules-in-form, rule typology, IAD framework

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Acknowledgments

These Coding Guidelines represent a compilation of coding methods from various sources, including: the *Formal Institutional Analysis Coding Guidelines* published by Saba Siddiki, Chris Weible, Xavier Basurto, and David Carter in 2011; codebook additions formulated by Edella Schlager, Jeffrey Hanlon, Tomás Olivier, Elizabeth Clark, and Abigail Bennett; institutional “mechanisms” coding protocol by Edella Schlager, Tomás Olivier, and Jeffrey Hanlon, and; definitions of regulatory and constitutive rules provided by David P. Carter - all of which were incorporated herein. The authors would like to thank Lynne Westphal for her helpful comments on earlier drafts of the coding guidelines.

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Introduction

Institutions are “the prescriptions that humans use to organize all forms of repetitive and structured interactions” (Ostrom, 2005, p. 3). Regardless of the label by which they are referred, such as rules or norms, institutions are social constructions: they represent shared understandings of behavior among actors who recognize, follow, and enforce the prescriptions. This document outlines a series of coding methods that can be used to analyze institutions-in-form, such as those found in public policy documents - from administrative rules to constitutions. The method is inspired by, and built upon, the conceptual foundations of Elinor and Vincent Ostrom’s institutional analysis and development (IAD) framework (Kiser & Ostrom, 1982; Ostrom, 2005).

How to Use these Coding Guidelines

These guidelines are written for the researcher with a relatively thorough understanding of the IAD framework and central IAD framework concepts. Researchers with less exposure to the framework are advised to familiarize themselves with core IAD framework literature - most notably Elinor Ostrom’s (2005) *Understanding Institutional Diversity* - prior to applying the guidelines. Additional notices on applying these coding methods follow.

Intended application. These methods have been developed for analysis of rules-in-form (sometimes referred to as “formal institutions”) found in policy documents, such as regulations, legislation, and city charters. They were not developed for application to unwritten institutions (aka rules-in-use). See Cristy Watkins and Lynne Westphal’s (2016) article “People Don’t Talk in Institutional Statements” for a discussion of applying such methods to an analysis of rules-in-use.

Relative reliability of coding methods. These methods vary in the strength of their confirmed reliability across different types applications and documents. For example, most of the procedures in the Institutional Statement Identification & Syntax Coding sections have been applied across a variety of documents including laws, regulations, and city charters, and appear in a number of publications. Identifying monitoring and compliance institutional configurations, in contrast, is a relatively recent addition to these methods. The extent to which the reliability of each method has been confirmed is noted in the guidelines that follow.

Coding method selection. While the following methods are presented as steps in a coherent coding protocol, it is probable that in practice only certain steps will be warranted. Coding methods should therefore be adopted and applied based on the research objectives in question. For example, in some cases researchers may be more interested in the distribution of rule types, and may forgo analysis of all institutional statement syntax components. In other cases, researchers may seek a more fine-grained understanding of policy documents, in which case full syntax coding may be called for.

Sequence of coding. For sake of presentation, the methods are presented here as a series of steps applied in succession. In practice, the coding steps are applied iteratively, and coding may evolve somewhat as the researcher gains a deeper understanding of the rules-in-form of interest.

Document Preparation

In this first step the analyst conducts a preliminary review of the rules-in-form/policy document

in question, familiarizing herself with the document, organizing its contents, and beginning the process of identifying institutional statements.

1) **Identify and read all definitions, titles, preambles, and headings.**

Definitions, titles, and headings are first identified because they are fairly easy to locate and provide information on the intent and context of the policy in question. Headers of sections and subsections should be retained as a manner of classifying and categorizing the statements in a given legislation or rule. The nature of the heading may also provide the coder with an initial indication of the types of institutions she will find in a given section.

2) **Identify sections and subsections of the bill as initial units of observation.**

We call headers of sections and subsections “outline indicators.” Outline indicators are titles, subheadings, capital or lowercase letters, colons, semicolons, or Roman numerals, used to separate sections from subsections and subsections from sub-subsections, etc. These initial units of observation are temporary and may be divided into additional units when there is more than one rule, norm, or strategy within them.

3) **Subdivide all initial section or subsection units from step 2 that have multiple sentences into sentence-based units of observation.**

If a section or subsection does not have a complete sentence ending in a period, code the entire section or subsection as one unit of observation. If there are multiple sentences in the section or subsection, code each sentence as a unit of observation. In some instances, a single rule, norm, or strategy may span outline indicators. For example, a statement may include a colon with a list of Objects (see below) separated by semicolons. In such examples, the coder will decide, based on the existence of grammar components, whether a statement is bound by the outline indicators, or spans them.

Institutional Statement Identification & Syntax Coding

In this coding step, individual institutional statements are identified and then dissected into syntactic components. Institutional statements can follow one of two basic syntaxes: constitutive or regulatory. The grammar of institutions, as created by Crawford and Ostrom (1995, 2005) applies to regulatory rules. Constitutive rules are defined and examined in depth by John Searle (1995, 2010). The determination of whether an institutional statement follows a constitutive or regulatory syntax is made based on the presence/absence of syntactic components, and the nature of the sentence verb (alm) in question.

It should be noted that of all the coding steps outlined in these guidelines, the regulatory syntax has been applied the most reliably and across the greatest number of applications (note, however, the exception regarding condition types below). Coding of the constitutive syntax is a more recent addition. While addition of the constitutive syntax may improve coding validity (as asserted by at least one of the authors of these guidelines), the constitutive syntax coding methods may require further development to attain satisfactory reliability.

1) **Code constitutive statements following the X/Y syntax.**

In contrast to regulatory rules, constitutive rules either declare a specified entity or define an entity or a position, or outline conditions/actions that ought to exist. Constitutive syntax

accordingly has one of two forms: “There is X” or “X is Y [under specified Conditions].” Indicators of constitutive statements include linking verbs that lack action, such as “is,” “means,” or “defines.” In written policy documents, such empty verbs frequently take the form of “shall be.” A second indicator is a lack of agency - it is difficult to imply what individual or entity is responsible for executing the rule. In contrast with regulatory statements (see below), this means that identifying an Attribute is problematic. Coding examples are provided in the institutional syntax codebook, found in Appendix II.

2) **Code regulatory statements following the ABDICO syntax.**

Regulatory statements outline allowed, prohibited, and required actions. Regulatory statements are coded with respect to the *Attribute*, *Deontic*, *alm*, *oBject*, *Condition*, and *Or else*. Definitions and coding examples are provided in the institutional syntax codebook, found in Appendix II.

- a) To verify coding, re-state the coded institutional statement in active voice in the following order: [A] [D] [I] [B] [C] [O]. The statement should make sense when coding is done properly. This strategy is most useful when the Attribute is explicitly stated. When the Attribute is implied adjustments may need to be made to the alm in order for the statement to make sense. Difficulty in implying an attribute may indicate the statement is constitutive (see above).
- b) When applicable, imply components when they are not explicitly provided in the statement. In some cases, the Attribute is missing because the statement under consideration is actually an extension of the statement prior to it in the document. In this case, the coder should use the Attribute from the previous statement. In other cases, an Attribute will not be obvious, in which case the implied Attribute will be the agent that is expected to carry out the alm, or who is requiring that the action being discussed in the statement is carried out. With respect to the Condition component, unless stated otherwise in preceding statements, the default Condition will be “at all times,” meaning that the directive is applicable in all cases unless an exception is explicitly stated.
- c) Distinguish between oBject and Conditions. Carefully assess whether certain words in an institutional statement constitute descriptors of the oBject (code as oBject) or modifiers of the aim (code as one of the Conditions). Depending on the research question of interest, it may not be theoretically necessary to distinguish between the oBject and Condition(s). Because the distinction introduces considerable difficulty in coding, if there is no a priori reason for distinguishing between them, it is suggested that the oBject and Conditions be coded together under the Conditions category.

3) **Code Conditions as What, When, Where, and/or How Conditions**

For certain research purposes and/or when statements contain a complex set of conditions concerning “what, when, where, and how” an action is to be performed, it may be desirable to further categorize the temporal, geographic, or contextual circumstances by specifically coding the What, When, Where, or How Conditions. Some institutional statements may have no Conditions (in which case, Conditions may be implied; see above), while some statements have multiple Conditions.

The focused coding of different condition types is a relatively recent undertaking, and as a consequence, coding instructions are still in a developmental stage. For example, there exists some disagreement among the authors of these coding guidelines as to whether “What” conditions sufficiently meet the conceptual definition of a condition. Researchers have found these to be useful coding techniques in practice, however, and they are therefore outlined here.

- a) **What Conditions:** The object specifies the recipient of the action of the alm. The what condition specifies the “thing” that the object receives or experiences. The what condition therefore defines the purpose of the alm. Warning: it is easy to confuse the object and the what condition; to minimize such confusion a) identify an animate (or an inanimate) object, if possible; one way to do this is to implicitly add “to” or “from” or “for” to the alm; b) if it is not possible to identify an object, then the object remains blank and the “thing” that defines the purpose of the alm is the what condition, do not treat it as the object (especially do not treat it as an inanimate object)
- b) **When Conditions:** The when condition can take two forms. Sometimes, a statement will give an explicit time that an action should be taken. Other times, a statement will signify a trigger event that should then promulgate a following action.
- c) **Where Conditions:** A statement has a where condition when it explicitly states a particular place in which the action should take place. The where condition does not apply to a whole category of place.
- d) **How Conditions:** Sometimes a statement will include information regarding how a particular end is to be achieved or outline a mechanism to achieve an outcome. How conditions also can reflect aggregation rules by specifying who is involved in a decision making process.

Rule Typology Coding

In this coding step, each institutional statement is categorized as one of seven rule types: Position, Boundary, Aggregation, Information, Payoff, Choice, and Scope. While there exist some ambiguities in coding rule types - particularly in regards to differentiating choice and scope rules - the following guidelines appear relatively robust and reliable across applications.

1) Code institutional statements as one of five rule types – position, boundary (credential or procedural), aggregation, information, or payoff

The primary indicator of the institutional statement’s influence on an action situation is its alm. The first step in classifying institutional statements, therefore, is to focus on the alm of the statement. Compare the statement’s alm with the basic alm verbs listed in Table 1, and in the rule typology codebook in Appendix III. Determine which basic alm verb best approximates the alm in question, and code the statement according to the corresponding rule type.

- a) Sometimes the alm of the statement is ambiguous or reflective of more than one basic

alm verb. For example, both information and payoff rules may have an alm that falls under the “receive” basic alm verb identification.

- b) The rule types have additional indicators, specific to rule type, which can be found in the codebook in Appendix III. These additional indicators can be particularly helpful in situations where the alm verb is ambiguous.
- c) Some statements cannot be coded simply as one rule type and may fall under two or more categories. For example, the statement: “The applicant must pay an entry fee to the organizer.” The statement is reflective of a payoff rule, as it assigns a cost to the applicant, and a benefit to the organizer. The statement is also reflective of a boundary rule, as it identifies a necessary action for the applicant to enter a position. *In such instances, the coder should code the statement in question according to the following order: position, boundary, aggregation, payoff, information.* This means, for example, that if a statement can be coded as both a boundary and an information rule, the coder will code it as a boundary rule.

Table 1. Rule types

Rule type	Basic alm verb	Regulated component of an action situation
Position	Be	Positions
Boundary	Enter or leave	Participants
Choice	Do	Actions
Aggregation	Jointly affect	Control
Information	Send or receive	Information
Payoff	Pay or receive	Costs/Benefits
Scope	Occur	Outcomes

Adapted from Ostrom (2005, p. 191)

2) Code remaining statements as either choice or scope rules

Choice rules refer to directives regarding what specific actions must, must not, or may be taken by an actor. The alm of a choice institution is an action. Scope rules outline or affect the outcome variable that must, must not, or may be affected as a result of actions taken within the action situation (Ostrom 2005, p. 208). The alm of a scope institution refers to an outcome rather than an action (Ostrom, 2005, p. 209).

Both the scope and the choice rule categories are designed as “all other” categories. If a rule is neither a position, boundary, aggregation, information, or payoff rule, then it is either a choice rule (aim = an action) or a scope rule (aim = an outcome) (Ostrom, 2005, p. 209).

Additionally, one can distinguish between scope and choice institutions by determining if the statement prescribes specific actions or action sets to be used in obtaining an outcome, in which case it is a choice institution.

- a) If the coder is interested in comparing the desired outcome of the rules, norms, and strategies in question, she may wish to track choice rules that also display elements of scope rules. For example, the statement: “The student must cite references in a manner that conforms to the university honor code.” In this case, “cite references” is the action set (choice rule), but also references an outcome with “conforms to the university honor code” (scope rule). The coder may choose to code this statement as a choice/scope rule.

Identifying Institutional Configurations

The IAD framework makes clear that rules do not operate in isolation, but rather as interdependent configurations. For some research purposes it may be desirable to conceptualize the configurations through which rules-in-form are intended to function. Of the coding steps in this codebook, rule configuration analysis requires the most interpretation and should be directed by the theoretical underpinnings of the analysis in question. It is also the area in this codebook with the least amount of empirical verification.

One approach to analyzing rule configurations, developed by Carter, Weible, Siddiki, and Basurto (2016), is to conceptualize the empirical action situations that are targeted by the rules-in-form of interest, and to group institutional statements by their corresponding “target action situations.” Identification of target action situations is facilitated by first identifying the outcome(s) of concern - defined as the intended changes in empirical conditions sought by a policy or a subset of a policy’s rules-in-form. The analyst then backtracks to identify the institutional statements that are directly linked to the realization of the identified outcome. For example, in the context of organic food certification, Carter *et al.* identify “certification approval/denial” as an outcome, and group corresponding institutional statements into an “application of organic certification” target action situation leading to that outcome.

As Carter *et al.* (2016) note, target action situations may be more-or-less clearly specified in regards to time, setting, and actors. Target action situations may be readily identifiable in some policy documents, and difficult or impossible to identify in others. Subsequent applications of the target action situation coding step have revealed that identifying target action situations may be contingent on the type of policy being analyzed. For example, target action situations appear to be more evident in regulations, but difficult to discern in the case of city charters.

In this codebook, we highlight a second approach to configurational analysis. In this sample coding scheme, institutional statements that delineate monitoring, compliance and enforcement mechanisms are identified in order to guide and standardize coding of statements that create or condition clusters of public goods or governance mechanisms. More detailed coding guidelines are provided in Appendix IV.

1) Code statements as monitoring, compliance, consequence, or collective-choice rulemaking mechanism statements

- a) **Monitoring mechanism statements:** Institutional statements related to the gathering, reporting, or reviewing of data that has been reported to determine whether someone has behaved according to the rules or whether rule following behavior is having the

desired effect on the biophysical system.

- b) **Compliance mechanism statements:** Institutional statements related to encouraging or maintaining rule following behavior by creating processes through which actors may question the actions of others or have those actions reviewed.
- c) **Consequence mechanism statements:** Institutional statements that determine a penalty (either a created penalty such as a fine or an inherent penalty such as a loss of a benefit realized by compliance of rules in effect) for an act of noncompliance or the nullification of rules.
- d) **Collective-choice rulemaking mechanism statements:** Collective choice rule making grants an actor or actors the authority to adopt or change rules. If the statements direct that something cannot happen unless a resolution is adopted, it should be considered a rule change/rulemaking mechanisms. Note that this step is identified in a separate section, below, for those coding collective choice rulemaking mechanisms without identifying the other mechanisms described here.

Coding Collective-Choice Rules-In-Form

For some research purposes it may be desirable to identify the rulemaking authority and mechanisms that are established, granted, or governed by the rules-in-form in question. In such instances, the analyst may code for the “collective choice rulemaking mechanism” statements, as described in the preceding section (and in Appendix IV), with or without coding for the other identified mechanisms.

It is worth noting that in other institutional research, multiple levels of analysis are studied or applied, including (but not limited to) the operational, collective-choice, and constitutional levels (Ostrom, 2005). Due to ambiguities and difficulties associated with identifying constitutional level statements, this codebook focuses on identifying collective-choice rules only. By default, all statements not coded as collective-choice statements will be understood as operational level institutional statements.

Operational institutional statements: Statements that structure situations which relate to day-to-day activities/actions, decisions, and interaction of individuals. Such statements communicate rules-in-form in which the actors are required to take (or not to take) direct action or adopt strategies for future actions.

Collective-choice institutional statements: Statements that constitute the manners in which the rules structuring operational level situations are monitored, reviewed, enforced, and altered. Collective choice rules can be described as rule making because they grant an actor or actors the authority to adopt or change rules. If the statements direct that something cannot happen unless a resolution is adopted, it should be considered a rule change/rulemaking statement.

The mechanisms identified above, i.e., monitoring, compliance, consequence, and rule change/rule making statements occur at the collective choice level.

Intercoder Reliability Testing

It is recommended that coding be assessed by another coder. Preferably 20% of the coded statements should be subject to intercoder reliability testing. At this time, coder agreement is generally assessed through simple percent agreement. Although not specifically agreed upon, generally intercoder agreement $\leq 85\%$ is evidence of low coder agreement and should result in codebook revisions and re-testing until higher agreement ratings can be reached (Guest and MacQueen 2008:131). Basurto et al. (2010) and Siddiki, et al. (2011) set acceptable intercoder agreement at $\geq 80\%$.

It should be noted that Krippendorff (2012) and Guest and MacQueen (2008) do not view simple percent agreement as an effective intercoder agreement statistic because it does not consider agreement by chance. Given the nature of the coding outlined in this document, however, applying a different statistic, such as Krippendorff or Cohen's kappa is difficult and may not be appropriate. Further research into appropriate intercoder reliability statistics is recommended.

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Appendix I. Definitions

Action situation: a social setting in which “two or more individuals are faced with a set of potential actions that jointly produce outcomes” (Ostrom, 2005, p. 32).

Aggregation rule: Aggregation rules relate to actions or decisions that require two or more individuals.

Aim (alm): The goal or action of an institutional statement that the deontic refers to.

Attribute: An animate actor (such as an individual or organization) that carries out the aim or is expected to perform the aim.

Boundary rule: Identify the prerequisites (characteristics, skills, possessions) of individuals eligible to occupy a position.

Choice rule: Specify specific actions – what an actor must, must not, or may do. Will often also indicate the conditions that affect what an actor must, must not, or may do.

Condition: The temporal, geographical, or contextual qualifiers of an institutional statement under which an aim is to be performed (or not performed).

Deontic: The prescriptive operator of an institutional statement that describes what is permitted (may), obliged (must, shall), or forbidden (must not, may not, shall not).

Information rule: Statements that indicate what is the permitted, obliged, or prohibited channel of communication, how the information is to flow, to whom, and when; May indicate the form that the information is to take.

Institution: The prescriptions that humans use to organize all forms of repetitive and structured interactions” (Ostrom, 2005, p. 3).

Institutional statement: “The shared linguistic constraint or opportunity that prescribes, permits, or advises actions or outcomes for actors (both individual and corporate)” (Crawford and Ostrom 1995, 583).

Object (oBject): The inanimate or animate part of an institutional statement that is the receiver of the action described in the aim and executed by the agent in the Attribute.

Or else: The punitive sanction resulting from noncompliance with a rule.

Outcome: The intended change or achievement in the condition of the world as a result of the policy.

Payoff rule: Assign external rewards or sanctions to actors relative to specified actions and/or outcomes.

Position rule: Identify roles to be filled by individuals and the absolute, minimum, or maximum number of individuals that can occupy a given position.

Rules: The “shared prescriptions (must, must not, may) that are mutually understood and predictably enforced in particular situations by agents responsible for monitoring conduct and for imposing sanctions” (Ostrom 2007, p. 23).

Scope rule: Identify required, desired, or prohibited outcomes; may also identify the parameters, or range, of outcome variables that can be affected, or identify limits or parameters to a required, desired, or prohibited outcome.

Target action situations: The intended action situation structured by a configuration of institutional statements identified within a policy text.

Appendix II. Institutional Statement Syntax Codebook

Table A1. Examples of constitutive statement X/Y coding

Syntax	Examples
There is <u>X</u>	“There shall be <u>an international whaling convention</u> .” “There shall be <u>a mayor</u> .”
<u>X</u> is <u>Y</u> [under specified Conditions]	“ <u>The Mayor</u> shall be <u>the Chief Executive Officer of the city</u> .” “ <u>The President of the Commission</u> shall become <u>the acting mayor</u> [during absences of the Mayor].”

Table A2. Regulatory syntax (institutional grammar tool; IGT) coding guidelines

Attribute
<p>Definition: an animate actor (such as an individual or organization) that carries out the aim or is expected to perform the aim.</p> <p>Coding guidelines/indicators:</p> <ul style="list-style-type: none"> • The Attribute may be explicit or implicit in any given institutional statement. • The words coded in the Attribute category must include with it all relevant descriptors. • In many cases, the attribute is most clearly identifiable once one has identified the aim of the statement; By first identifying the aim, the coder can ensure that there is a logical relationship between the Attribute and the action being described in the aim, that is, it is possible for the former to perform the latter. • If there are two attributes for which all other fields are identical, including the Deontic, aim, Condition, etc., then the statement does not need to be divided up into multiples statements. • Coder may encounter instances in which agents are nested within larger organizations/groups, but only the former, the primary agent, is explicitly stated and the secondary agent may be inferred. <ul style="list-style-type: none"> ○ For example, such an occasion is observed when an actor is a representative or employee of an organization and he/she is carrying out an aim on behalf of his/her organization as a whole. In this case it may be useful for the coder to know both the nested agent in addition to the secondary agent. In such an instance, the explicitly stated agent may be listed as the Attribute and the secondary agent may also be included in brackets next to the other. • In instances where the Attribute of an institutional statement is an inanimate actor (e.g., “Appendix I”) reword the statement to include the implied animate actor who will be performing the action of, e.g. listing a species in an Appendix. • Attribute must be logically able to perform the aim.
Deontic
<p>Definition: The prescriptive operator of an institutional statement that describes what is permitted (may), obliged (must, shall), or forbidden (must not, may not, shall not).</p>

Coding guidelines/indicators:

- Deontics are usually explicit, but may also be implicit.
- Deontics are useful markers for delineating institutional statements.
- Start separating institutional statements by first looking for a Deontic. It may help to follow this coding order: [D][I][B][C][O]/[A]

alm

Definition: The goal or action of the statement that the deontic refers to.

Coding guidelines/indicators:

- The alm is usually the verb of the sentence.
- The alm includes all non-deontic verbs.
- Any qualifiers of the alm , including the identification of temporal and spatial boundaries relating to the action being discussed, should be included under the Condition(s).
- The interpretation of the alm will determine what is the attribute and what is the oBject and this may also potentially modify the deontic. This is particularly applicable in cases where the definition of the alm is vague or when the alm has multiple definitions and thus there is ambiguity about the meaning as applicable for the statement.
- If you have multiple alms in a statement assigned to one attribute, the definitions of which are unambiguous and well understood, than the statement does not need to be broken up.
 - If, however, you have multiple alms and multiple attributes, then the statement should be broken up so that each attribute is distinctly assigned the alms being discussed.
- If you have two alms for the same attribute but there are multiple conditions that comprise multiple institutional statements, then the statements should be broken up based on the alm and relevant conditions/statements.

oBject

Definition: The inanimate or animate part of a statement that is the receiver of the action described in the alm and executed by the agent in the attribute.

Coding guidelines/indicators:

- The oBject helps distinguish the actor (Attribute) from what the actor is acting upon (oBject) in instances when an institutional statement does not contain an explicit attribute.
- The words coded in the oBject category must include with it all relevant descriptors.
- If there are two oBjects for which all other fields are identical, including the Deontic, alm, Condition, etc., then the statement does not need to be divided into multiples statements.
- If there are two oBjects and the other fields are NOT identical, including the Deontic, alm, Condition, etc., then the statement should be divided into multiple statements.
- There is an important distinction between the IGT oBject and the indirect object of a sentence. The IGT oBject is the receiver of the action described in the alm, but the indirect object receives the direct object of the sentence; not the action of the verb.

This can lead to instances in which institutional statements grammatically have no indirect object, but an IGT oBject is present and should be coded.

Or else

Definition: The punitive sanction resulting from noncompliance with the rule.

Coding guidelines/indicators:

- Or else statements must be explicit in order to be coded, although the explicit “or else” can be located in the same institutional statement or a different one.

Condition (generally)

Definition: Indicate the temporal, geographical, or contextual qualifiers under which the alm is to be performed (or not performed).

Coding guidelines/indicators:

- Conditions can be explicit or implicit.
- Conditions set the prerequisites or restrictions on the alm.

What Condition

Definition: The what condition specifies the “thing” that the oBject receives or experiences. The what condition therefore defines the purpose of the alm. Warning: it is easy to confuse the oBject and the what condition; to minimize such confusion a) identify an animate (or an inanimate) oBject, if possible; one way to do this is to implicitly add “to” or “from” or “for” to the alm; b) if it is not possible to identify an oBject, then the oBject remains blank and the “thing” that defines the purpose of the alm is the what condition, do not treat it as the oBject (especially do not treat it as an inanimate oBject)

Coding guidelines/indicators:

- Can be the purpose of the action
- May be a person, organization, animate or inanimate object,
- The “what” condition can thus be thought of as answering questions such as “why?”, “for what purpose?”, “for what?” or “for whom?”
- Sometimes the what condition is the direct object of the statement.

When Condition

Definition: Temporal qualifiers of the alm action.

Coding guidelines/indicators:

- Sometimes, a statement will give an explicit time that an action should be taken.
- Other times, a statement will signify a trigger event that should then promulgate a following action.

Where Condition

Definition: Geographical/contextual qualifier in which the action/directive should take place.

Coding guidelines/indicators:

- The where condition does *not* apply to a whole category of a place.
 - Example: “The City will pay the entire costs of designing and implementing stormwater pollution prevention measures where lot constraints prevent the construction of the home outside the limiting distances” does *not* have a “where” condition. Even though the word “where” is used and it implies that

there are many places with similar lot constraints, this statement actually signifies a physical condition of a category of thing. It implies that there are many properties that have lot constraints throughout the watershed, but doesn't say where they actually are.

How Condition

Definition: Information regarding how a particular action/end is to be achieved.

Coding guidelines/indicators:

- The how condition provides information on how a particular end is to be achieved.
 - Example: “The coalition shall choose qualified contractors using a bidding procedure acceptable to the city.” This statement includes a prescription as to how the action is to be done, i.e., “using a bidding procedure acceptable to the city.”
- The how condition can also be an aggregation rule outlining who is to be involved in a decision-making process.
 - Example: “CW Corporation shall develop program standards in consultation with NYCDEP and the Identified Communities where septic districts shall be formed.” In this statement, you would code “in consultation with NYCDEP and the Identified Communities” under the how condition.

Table A3. Regulatory syntax coding examples

Syntax component	Definition	Examples
Attribute	An animate actor (such as an individual or organization) that carries out the alm or is expected to perform the alm.	
Deontic	The prescriptive operator of an institutional statement that describes what is permitted (may), obliged (must), or forbidden (must not).	
alm	The goal or action of the statement that the Deontic refers to.	
oBject	The inanimate or animate part of a statement that is the receiver of the action described in the alm and executed by the agent in the attribute.	
Or else	The punitive sanction resulting from noncompliance with the rule.	

What Condition	The what condition specifies the “thing” that the object receives or experiences; The what condition therefore defines the purpose of the alm.
When Condition	Temporal qualifiers of the alm action.
Where Condition	Geographical/contextual qualifier in which the action/directive should take place.
How Condition	Information regarding how a particular action/end is to be achieved.

Appendix III. Rule Typology Codebook

Table A4. Rule typology coding guidelines

Definition	Basic alm verb	Regulated component	Additional coding guidelines/indicators
Position Rules			
Identify roles to be filled by individuals; also identify the absolute, minimum, or maximum number of individuals that can occupy a given position.	Be	Positions	<ul style="list-style-type: none"> • Statements that create identifier categories. That is our ability to say, ahh he is a fisher, he is a farmer... identify generic positions to be filled. • Statements related to the number of individuals that can occupy positions.
Boundary Rules			
Identify the requirements (characteristics, skills, possessions) of individuals eligible to occupy a position, or the constraints and conditions for entering and exiting positions.	Enter or leave	Participants	<ul style="list-style-type: none"> • Boundary rules define the requirements for participants to access a particular position, NOT the mechanism as to how they get that position. • Boundary rules are to be coded as either boundary-credential or boundary-procedural. • Boundary-credential: Statements delineating the characteristics and skills of individuals requisite to fill positions (e.g.: age, experience, education level). • Boundary-procedural: Statements delineating requirements for entry to a position, such as fees for permits, applications, etc. • Statements that identify parameters pertaining to positions. For example, statements that identify the term limits of individuals occupying a particular position.
Aggregation Rules			
Outline actions or decisions that require two or more individuals.	Jointly affect	Actions	<ul style="list-style-type: none"> • Statement that address how participants are related in decision making processes. • To be coded as an aggregation

rule, joint action is evidenced by the presence of two or more actors in the Attribute field who must, in concert, perform the activity specified in the aim of the institutional statement.

- Aggregation rules specify who is to be involved in a decision process. Without necessarily delineating particular responsibilities or roles (like a position rule) they refer to who is “at the table.”
- Sometimes, aggregation rules occur as a part of a scope or choice rule. That is, the entire institutional statement specifies who must be involved in a decision or action, and what that decision or action should or should not be/ may or may not be.
- An institutional statement is only aggregation when the actors are specifically required to carry out the action described in the aim jointly or via collaborative action.

Information Rules

Statements that indicate which is the permitted, obliged or prohibited channel of communication, how the information is to flow, to whom, and when. They also may indicate the form that the information is to take.

Send or receive Information

- Statements that combine a form of information and communication. The combination may be who the information is to be communicated to, from whom, when, or how.
- Statements about what information is *prohibited* from being communicated.
- NOT statements that communicate *what* is to be communicated (these are generally coded as choice).

Payoff Rules

Assign external rewards or sanctions to specific

Pay or receive

Costs/ Benefits

- Statements that contain all ABDICO components.

actors relative to distinct actions.			<ul style="list-style-type: none"> • Statements that allocate benefits or costs.
Choice Rules			
Specify specific actions – what an actor must, must not, or may do.	Do	Control	<ul style="list-style-type: none"> • Statement cannot be confidently classified as a position, boundary, aggregation, information, or payoff rule, but identify specific actions or action sets. • May also identify outcomes if coded as choice/scope institutions
Scope Rules			
Identify required, desired, or prohibited outcomes. They may identify the parameters, or range, of outcome variables that can be affected, or identify limits or parameters to a required, desired, or prohibited outcomes.	Occur	Outcomes	<ul style="list-style-type: none"> • Scope rules define a particular goal that is to be achieved. • Statement cannot be confidently classified as a position, boundary, aggregation, information, or payoff rule, and that refer to outcomes, goals, or results. • Statements that do <i>not</i> identify defined action sets or limit the processes that lead to an outcome. • May also identify specific actions or action sets if coded as choice/scope institutions.

Table A5. Rule typology coding examples

Rule Type	Definition	Examples
Position	Identify roles to be filled by individuals; also identify the absolute, minimum, or maximum number of individuals that can occupy a given position.	
Boundary	Identify the requirements (characteristics, skills, possessions) of individuals eligible to occupy a position, or the constraints and conditions for entering and exiting positions.	<i>Boundary-credential:</i> <i>Boundary-procedural:</i>
Aggregation	Outline actions or decisions that require two	

or more individuals.

- Information** Statements that indicate which is the permitted, obliged or prohibited channel of communication, how the information is to flow, to whom, and when. They also may indicate the form that the information is to take.
- Payoff** Assign external rewards or sanctions to specific actors relative to distinct actions.
- Choice** Specify specific actions – what an actor must, must not, or may do.
- Scope** Identify required, desired, or prohibited outcomes; may identify the parameters, or range, of outcome variables that can be affected, or identify limits or parameters to a required, desired, or prohibited outcomes.
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Appendix IV. Identifying Institutional Configurations (Mechanisms)

In this coding step, the configuration of rules, norms, and shared strategies which influence the choices of individual actors are examined. Identifying institutional statements that create or condition the following mechanisms enables the standardized identification of institutional configurations that connect monitoring and compliance mechanisms within rules-in-form with likely positive or negative compliance consequences and related public goods production or control.

Table A6. Identification of rule mechanisms

Monitoring Mechanisms Statements

Definition/criteria:

- Monitoring is the act of collecting data or information regarding the behaviors and activities of an actor or a biophysical or a social condition (i.e. flooding, socioeconomic issues). Monitoring is the foundation for determining compliance.
- Monitoring ≠ information rules, if the information shared is about whether someone is complying with the rules, then code it as a monitoring rule. Otherwise, code it as something else.
- Monitoring is a shared act. A single actor collecting information for its own purposes only is not monitoring.
- The single fact of requiring that an action should be conducted in consultation with other actor/s is not considered monitoring.
- Inspections count as a form of monitoring.
- *Who monitors what* varies.
 - **Self-monitoring** is the act of collecting data on one's own organization/agency/government's behaviors. The act of collecting data on one's own organization is for the purpose of sharing it or making it available to other actors.
 - **Other party monitoring** is the act of collecting data on the behaviors and activities of another actor/party. Other party monitoring is engaged in by an actor who is part of the agreement or is engaged in the interaction.
 - **Third party monitoring** is the act of collecting data on the behaviors and activities of another actor/party. Third party monitoring is also the act of collecting data on a biophysical or social condition that is dependent on one or various actor behaviors. The actor in charge of collecting this data is somebody who's independent of the interaction, and is brought in to monitor the interaction. This actor is not a participant or has a stake in the action taking place.

Coding guidelines: Monitoring statements satisfy any of the following:

- The statement prescribes an actor to collect data on its own or other actors' behaviors, or identifies data to be collected and shared. Information sharing in the form of advice or best practices is not monitoring.
 - The statement prescribes a means of gathering/collecting data and/or receiving/reviewing data.
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Compliance Mechanisms Statements

Definition/criteria:

- Compliance determines the means and methods by which an actor determines if another actor has complied with a rule. This definition includes, but is not limited to, those statements prescribing mechanisms to address disagreements among actors (i.e. processes of arbitration to solve a dispute between two or more actors).
- If the statement defines circumstances in which an action will not be considered a violation of the rule and doesn't mention any punishment, then code it as compliance.
- Compliance involves always a process through which actors determine what it is noncompliant behavior.
- If a statement forbids an actor to challenge another actor's compliance with a rule, then that statement is defining a compliance mechanism and should be coded as such.
- A statement that tells an actor to "follow the rules" does not define compliance.

Coding guidelines: Compliance statements satisfy any of the following:

- The statement determines the means/criteria/process by which an actor (or group of) determines another actor is out of compliance with a rule. The statement identifies a compliance process, triggering of review, means/criteria of review.
- The statement defines the authority of one actor (or group of) to correct another actor's noncomplying behavior.
- When a rule forbids an actor from challenging another actor's behavior.

Consequence Mechanism Statements

Definition/criteria:

- Consequences do not necessarily (or often) show up in the "or else" portion of an institutional statement, but are more likely to be defined broadly, and serve as the "or else" consequence for noncompliance with some or all of the other rules in the set or as a consequence of rule nullification.
- Enforcement may refer to specific sanctioning authorities such as levying fines for noncompliance, or it may be a loss of a benefit or a desirable action given a failure to act.

Coding guidelines:

- The statement generally defines a consequence for rule noncompliance, inactivity, or nullification.

Collective Choice Rule Making Mechanisms

Definition/criteria:

- Institutional statements that define **which actor(s)** hold the authority to make a rule change, the **process** of rule change, the **criteria** upon which a change is based, the **trigger** for a rule change, or **identifying** the rule to be changed.

Coding guidelines:

- When a collective body (e.g. town council, city council, agency) goes through a rulemaking process, those are considered collective-choice rulemaking processes, thus they should be coded. To be coded, the action really has to focus on some
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collective body engaging in rule changing or rulemaking process.

- Resolutions adopted by local governments, understood as expression the will of a collective body, don't count as rule changes. Approvals are not considering being a rule changing or rule making mechanisms.
- Adoption of a contract is not a rule change.
- Adoption of agreements is not a rule change.
- Adoption of laws is a rule change.
- Requests for extensions do not count as rule changes.

Identifying and coding public goods and governance clusters

Coding guidelines:

- Always read each statement in context. To properly identify the monitoring/enforcement nature of a statement it is necessary to analyze it in terms of the role it plays within the context of the prior/subsequent rules. Also, the portion of the statement that contains the Attribute, Deontic, alm, and oBject indicates the mechanism. Any "mechanisms" that show up in the conditions will be not coded as such.
 - Each public good cluster or governance mechanism is bounded by the coded document's sections. Distinct clusters and mechanisms occur within each section. That is, the clusters and mechanisms do not cross over sections.
 - Within each section, public good clusters and governance mechanisms consist of TWO (2) or more contiguous statements. Single statements do not count as a distinct mechanism and are included within the mechanism in which they appear, if they are in the middle of a series of statements defining a specific mechanism or cluster. Or, they are included with the mechanism that precedes or proceeds depending on meaning. The contiguous statements must be contained within a section and cannot overlap a section.
 - A section may consist of a mechanism or a cluster; or multiple clusters and mechanisms may appear in a single section. That is, a section may contain a public goods cluster and a governance mechanism.
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