This article takes issue with a gap existing between two types of sociological theorizations of IR. A first type sets to widen the state-centric structuralism and static historicism of conventional IR theories and develop more sociological conceptions of international politics, reworking the interrelationship between societal and political structures, institutions, and actors (Albert and Buzan, 2017; Hobden and Hobson, 2002; Kessler, 2009; Lawson and Shilliam, 2010; Nexon and Neumann, 2017). A second strand develops a sociology of the agents producing IR, focusing on the discourses and practices involved in the production, ordering and diffusion of IR knowledge, and the critical and normative implications that follow from socializing these processes (Bueger, 2012; Grenier, 2015; Leander, 2011; Tickner, 2013; van der Ree, 2014; Waever, 1998). The paradox is that while both approaches claim to offer more systemic, in terms of expanding ontological and epistemological boundaries, and more reflexive theorizations, in terms of recognizing the social embeddedness of IR objects and subjects, both have proceeded in relative disconnection, carving different “scientific ontologies” (Jackson and Nexon, 2013: 550): one external and structure-oriented, accounting for the ordering of the IR world, the other internal and practice-oriented, accounting for the ordering of IR knowledge. Theorizations that discuss both ontologies as part of same society, the same *social whole*, remain fairly rare, and more often than not, grounded in philosophical rather than sociological argument (Frost and Lechner, 2016; Hamati-Ataya, 2017; Jackson, 2008; Patomaki and Wight, 2000).

To a certain extent, this may have to do with sociological approaches to IR, despite their dynamism, being relatively new (Bigo and Walker, 2007; D’Aoust, 2012). The problem of reconciling the domain of international action with the domain of IR theory however, is a long-standing preoccupation, with numerous theorists having attempted to bridge the divide between structural/objectivist and critical/interpretivist positions. Almost two decades ago, Alexander Wendt (2001: 222) underlined the inability IR theory had to balance objective analyses of society’s deep structures and “systemic possibilities” with creative and emancipatory speculations about “desirable” future states. Friedrich Kratochwil (2007: 13)’s more recent plead for a pragmatic IR theory also follows the need to recognize the “interdependence of semantics and social structures”; to accept that knowledge-production is a socially-structured practice, but also that the rules of knowledge generation cannot be reduced to the actions of a particular group. Others have called for a return to Marx, in order to re-insert theoretically rigorous views of social totality into IR critical and normative arguments (Koddenbrock, 2015). In this regard, Stefano Guzzini (2010: 302–4) characterized the challenge of theorizing IR’s epistemological position along with the “ontological specificity of the social world”, as one the last great frontiers in IR theory.

However, these bridging efforts have been noted to clash against certain problems of observation that emerge when conceiving both the “IR world” and the “IR observer” as social systems: a *reflexivity* trap, where the social character of the world and its inscription in IR knowledge is accepted, but not so much the reverse, so that IR theories remain detached from the world they observe (Beaulieu-Brossard, 2015), and a *sociological* trap, where the sociology of IR agents is conflated with the sociology of IR knowledge, so that the awareness agents show about their social location allows them to somehow transcend structural restrictions (Grenier, 2015). Paraphrasing Pierre Bourdieu, these problems point to the lingering difficulty IR has to theorize itself as “[…] a social construction of a social construction” (Bourdieu, 2004: 88).[[1]](#footnote-2) This article moves to reformulate these problems by connecting sociology of IR arguments with a framework that considers both IR and its world to be structured by a common socio-heuristic process. It does so by drawing from a tradition of sociological theorizing known as “sociocybernetics”, which has been scarcely discussed in IR reflexive and sociological circles, even if having relevant antecedents in earlier IR debates.

Influenced by discoveries in evolutionary biology, psychoanalysis, quantum physics, and information theory, cybernetics emerged in the mid-20th century as an eclectic intellectual movement aspiring to generate a “trans-discipline” to spread knowledge about the behavior and ordering of complex systems, be these physical, biological, or social. The proposition was that this complexity could be understood by looking at how these systems processed information and at the role played by exchange, feedback, and filtering mechanisms, an appealing notion to study complexity in a diversity of fields, from physics, engineering, and computer science, to neurophysiology, sociology, and political science, among others.[[2]](#footnote-3) However, in time, a second strand of cyberneticians took this proposition further, developing a radical epistemology of observation where communication and ordering were seen as information-based processes dealing with the “organization of experience” rather than with the objective structure of an independent reality (Bateson, 1972; Von Glaserfeld, 2002).. A representative of this second current, physicist-polymath Heinz von Foerster (2003: 285–6), thus distinguished between a “first-order cybernetics”, concerned with the behavior of *observed* systems, and where the observer is extrinsic to the observation process, and a “second-order cybernetics” (from here onwards, SOC) dealing with *observing* systems, where the observer is endogenous.

While earlier first-order cybernetics exerted significant influence in North American social sciences, including IR, between the fifties and sixties, and influenced latter applications in conflict studies and military strategy (Alker, 2011; Bousquet, 2009; Deutsch, 1963; Kaplan, 1957), due to its reflexive implications SOC propositions failed to generate the same level of enthusiasm (Kline, 2015: 196; Ramage, 2009). As explained ahead, the sociological theorization of SOC, what this article understands as sociocybernetics,[[3]](#footnote-4) developed largely in Europe after the seventies, principally associated with the monumental work of Niklas Luhmann and his theory of society as a functionally-differentiated system of communications (Luhmann, 2012: 217). But while discussions of Luhmann’s ideas in IR have been advanced in recent years, mainly by way of first-order applications of his functional differentiation thesis to the layering of “world society” and global governance (Zürn, 2018; Albert, 2016; Peña, 2015; Albert and Buzan, 2013; Albert and Hilkermeier, 2004), the reflexive aspects of his theory have remained largely ignored (Albert et al., 2008). This article complements these advances by applying a sociocybernetic theorization of observation and communication to the sociology of IR.

This argument is developed in three parts. First, as sociocybernetics is not a well-known proposition, the article provides a general introduction to basic cybernetic ideas followed by a brief examination of Luhmann’s sociology of knowledge-producing systems, establishing a conceptual platform from where to extend sociocybernetics to IR. In the second section, the article applies these ideas by examining IR as an observing social system that reproduces itself by structuring its internal communications, i.e. IR theories. Accordingly, the evolution of IR theorizing is re-evaluated from a sociocybernetic perspective to argue that multiple “problems of observation” – in the form of problems of boundaries, of plurality, and of reflexivity – have emerged and been ‘managed’ through changes in observational perspectives, both by first-order theories concerned with the external world, and by second-order theories looking at IR itself. Returning to the sociology of IR, the third section discusses the general structuring of IR theory as a functionally-differentiated system, teasing out some of the implications this has for reflexive and critical theorizing.

The article makes three nested contributions to the IR and IPS literatures. First, it revises a set of conceptual difficulties present in sociology of IR arguments stemming from a dualistic treatment of IR as a social system. Second, it sheds light on an under-explored side of a sophisticated school of sociological theorizing which IR (particularly Anglophone IR) has tended to sideline in its meandering social explorations, one that can enrich contemporary arguments about IR’s functioning and location in the world. Third, it hopes to reinvigorate socio-systemic theorization in IR, underlining certain insights the (socio)cybernetic paradigm may bring to the conceptualization of the relationship between complexity, observation, and social structuring.

## Cybernetics and the Problem of Complexity

In a now classic article, Warren Weaver (1948: 538) considered that “organized complexity” represented the primary problem of modern science; accounting for situations where the observer faced “a sizable number of factors which are interrelated into an organic whole” as was commonly the case in the biological and social worlds. Six decades later, this was reaffirmed by biologist Stuart Kauffman, who stated that

“…organisms, whose evolution of organization of structures and processes, such as the human heart, cannot be deduced from physics, have causal power of their own, and therefore, are emergent real entities in the universe. So, too, are the biosphere, the human economy, human culture, human action’ (Kauffman, 2008: 3).

Kauffman pointed to Darwin’s evolution as the theory that ruptured the Newtonian paradigm of nature, and that infused scholarly interest in what physicist John von Neumann called the “complexity barrier” – the point where the accumulation of quantitative changes in a system produces a qualitative change in its behavior (Von Neumann, 1966). In the fifties, this puzzle captured the attention of the proponents of cybernetics and systems theory, who noted that certain systems involving information-feedback mechanisms were capable of adapting by creating intermediate forms of internal order; that is, they reproduced by structuring their own complexity (Ashby, 1956; Maruyama, 1963; Von Bertalanffy, 1972). Cyberneticians considered that complex systems could be examined by looking at how they exchanged information externally and processed it internally, irrespective of whether they were computer algorithms, biological brains, or political bureaucracies. This was a powerful idea: it not only allowed extrapolating insights from the physical sciences to the biological and social worlds (and vice-versa), but as noted by Nobel Prize winner Herbert Simon (1996: 174), it enabled an alternative treatment of the problem of complexity where this was not viewed as a property of things but as a processual outcome. Therefore, if the processing of information within those systems could be understood, their complexity could be grasped and perhaps intervened upon.

Early cyberneticists – such as Wiener, Claude Shannon, and John von Neumann, many of them mathematicians, engineers and computer scientists that had worked in telecommunication and cryptographic projects for the Allies – understood the emerging relationship between complexity and observation through a theory of information and control, where communication (observation) involved the distinction of a message (information) from environmental “noise” (complexity), so that the decoding of a message always involves the ability to simplify and produce order (control) (Bousquet, 2009; Galison, 1994; Kline, 2015). This fundamental understanding remains a basic pillar of the cybernetic paradigm: systems with greater capacity to process and screen information are more capable of reproducing communications and maintaining internal coherence – a notion with clear biological underpinnings (Meadows, 1957: 5).

However, cybernetics accommodated two distinct epistemological modes of observing complexity. The fist mode was a reductionist one, where complexity was an emergent outcome of simple but repeated interactions between basic units following genetic rules. As in this mode complexity could be explained from simplicity, it was possible to render system models within a positivist analytical epistemology where “the perceived complexity of a situation depends in part on how well we can simplify reality, and our capacity to simplify depends on whether we can specify outcomes and variables in a coherent way” (King et al., 1994: 10). Accordingly, algorithmic models of complex systems could be constructed, their functioning and behavior simulated and (potentially) validated, and intervention strategies explored, an approach suited to mathematical cyberneticians, military planners, and social scientists seeking “to quantify the social sciences in Cold War America” (Kline, 2015: 136). In the fifties and sixties, this included IR scholars of the stature of Karl Deutsch, Morton Kaplan, and Hayward Alker, among others, who saw in cybernetics a way to reformulate and examine political relations, domestic and international, in more scientific terms, while avoiding criticisms that Newtonian models resulted in the “dismemberment of reality” (Alker, 1966: 624; Kaplan, 1966).[[4]](#footnote-5) Moreover, this first variant of cybernetics would shape developments in computer simulation, complexity studies, and cognition and decision-making theories, with multiple applications to international affairs and conflict studies that cannot be covered here (Deutsch, 1990; Axelrod, 1997; Cederman, 2005; Bousquet, 2009; Braumoeller, 2012; Kavalski, 2015).

The second mode differed in that it considered complexity not as an ontological property but as an epistemological one: complexity is a product of an observer confronting an environment that somehow is “[…] too large for him; so that he cannot observe it completely, or control it completely, or carry the predictions for calculations completely”, as British psychiatrist W. Ross Ashby (1956: 62) stated. In this case, the complexity of the *observed* system emerges as a relational outcome of the positioning of an *observer* system, so that “complexity can never be fully reduced to an underlying simplicity since simplicity, like complexity, is a construct that could always be other than it is” (Rasch, 1991: 70). Biologist Robert Rosen (1977: 229) viewed complexity as a function of the number of ways available to interact with an observed system: complex systems were those that did not tolerate simple Newtonian descriptions – called “encodings” by Rosen – that synthesize future systemic states, as in time the behavior of the system will diverge from any fundamental description made of it (Rosen, 1985: 193). From this position, the problem of complexity could not be resolved by unpacking the fundamentals of a system’s ontology. Rather, the question is understanding how complexity *and* simplicity, two co-related forms of order, are produced and managed by changes in the perspective of the observer.

This second-order mode was received with skepticism both by quantitative cyberneticians and in the progressively behavioralist North American social sciences, and only as the influence of first-order cybernetics started waning in the early seventies, the idea that cybernetics had remained overly oriented to external (observed) systems gained certain salience.[[5]](#footnote-6) Thus, a second strand of thinkers – many of whom had participated in earlier cybernetic debates, such as von Foerster, anthropologists Gregory Bateson and Margaret Mead, British psychologist Gordon Pask, and Chilean biologist Humberto Maturana (Corning, 2007; Halpern, 2014; Maturana, 2002; Ramage, 2009) – considered that the field should move from an engineering-inspired treatment of communication as information to a wider *semantic* conception, one that recognized that the basic form of complexity reduction in society occurred via the *imposition of meaning* by a socio-cognitive observer – so that “[…] perception should not be viewed as a grasping of reality, but rather as the specification of one” (Maturana cited in Kline 2015: 197). This was a bold proposition, as it involved accepting that the separation between observer and observed – between a system’s ontology (what the system is) and a system’s epistemology (how it is known and described) – is an internal one, produced as part of a SOC process of observation, selection, and complexity reduction. For this reason, it was problematic for positivist scholarship, as while not entirely denying scientific realism, it viewed first-order science a *sub-type* within a broader meta-epistemology of observation contingent on the separation between the observer and the observed (Morin, 2008: 27).[[6]](#footnote-7)

The reception of SOC ideas was better in the more interpretivist circles of European social theory, given that it proposed a socio-systemic view of society coupled to a radical constructivist argument that “de-ontologized” reality and abandoned essentialist views of science, knowledge, and society (Geyer and van der Zouwen, 1978; Luhmann, 1990b; Pottage, 1998). Luhmann, in particular, relied on SOC notions to propose that modern society stabilized itself by narrowing the spectrum of its observational possibilities via the differentiation and specialization of social sub-systems, so that the system politics observes the world politically, the economy economically, and science scientifically, but it is no longer possible nor necessary to integrate these communications into a master encoding that observes society’s wholeness (Luhmann, 1986: 89, 2012). In this way, social systems made the reproduction of social communication possible by organizing semantic complexity: reducing the external complexity *from* the world by increasing complexity *within* them. With this, Luhmann combined the cybernetic notion of “selective observation” with the classical theory of social differentiation found in Durkheim’s treatment of organic solidarity, Weber’s rationalization, and Parsons’ AGIL schema, among others.

Without delving into other aspects of Luhmann’s theory, it becomes possible to grasp the basic sociocybernetic relationship established between the internal structuring of a social system and the differentiation of its observations and communications.[[7]](#footnote-8) As this very relationship structured the operation of observing systems such as science (and its subfields), tasked with producing knowledge claims about the world, sociocybernetics opened the door to a reflexive sociology of knowledge.

### Science as an Observing System

While sociocybernetics aimed at widening scientific knowledge by providing a second-order theoretical account of science’s functioning as a social system, it also criticized the idea that reductive science provided a superior description of the world, as this entailed conceiving science as a system observing society from above. As many sociologists of modernity, from Giddens and Foucault to Ulrich Beck and Bruno Latour, Luhmann accepted that scientific communications occupied a central role in societal reproduction, to the extent that modern society was strongly dependent on these to function (Giddens, 1990; Luhmann, 1994a). However, his conception of science differed both from the Popperian normative-methodological approach, concerned with how scientists *should* do science, and from the Kuhnian social model, concerned with how scientists *actually* behave (Umpleby, 1990). Instead, in Luhmann’s sociocybernetics science is the system of communications structuring the relationship between truth and knowledge, a form of functional specialization resulting from a differentiation process unfolding since the 17th-century that saw scientific rationality gaining semantic autonomy from political, legal, and religious definitions and jurisdictions (Luhmann, 1995: 251). As part of this process, science developed its own coding, a specific *grammar* of theories and methods that separated its communications from those of other systems, so that science is the only social system that exclusively observes and communicates in theoretical terms. This, rather than objectivity, is the basic distinction reproducing scientific communications: objectivity is just a type of simplification configuring a first-order modality of scientific observation premised on the principle that “the properties of the observer shall not enter the description of his observations” (Von Foerster, 2003: 288) – a practical principle enabling to filter a tremendous array of environmental noise and preventing certain problems of observation and reflexivity.

Scientific models and theoretical paradigms therefore emerge as the basic communications through which science structures itself and its observations. This conception turns the distinction between ontology and epistemology into a bidirectional relationship between the knowledge possessed by the observer and the structure and behavior of the observed (social) system (Geyer and van der Zouwen, 1991: 87; Umpleby, 1990).[[8]](#footnote-9) Luhmann’s thesis was that science had not only differentiated from other social systems, but also differentiated internally, dividing into increasingly specialized sub-systems and sub-sub-systems. This was also a socio-heuristic outcome of the process of observation: early scientific theories emerge as responses to problems in a society that no longer could understand itself according to hierarchical or unified conceptions of nature or order (the prior function of religion). This gradually resulted in the emergence of separate fields of theorization, with political theorizing engaging with the problem of sovereign power, the separation between subject and objective reality being addressed by new theories of cognition and transcendentalist philosophies, and the convolution of national and international economies eventually producing separate economic theories (Luhmann, 1990a: 185). However, as theorizing “discovers” a world more complex than initially thought, this produces new problems and systemic pressures for meaning and explanation, which lead to new theories and discoveries, further (internal) specialization, and increasing (external) complexity.[[9]](#footnote-10)

From this perspective, the progressive differentiation into disciplines, sub-fields, and theories is what stabilizes science as a system: as differentiation advances, and each discipline develops its own theoretical patterning, science as a whole ceases to require normative, cultural or territorial coherence, or meta-theoretical and methodological consistency, so that

‘[…] the global interconnectedness of science is not the result of one worldwide community of scientists with a shared set of normative and cognitive presuppositions emerging. Instead it is the incessant proliferation of ever-new communities of scientists with progressively restricted jurisdictions, which organizes the social and cognitive space of science’ (Stichweh, 1996: 332).

In this manner, the reproduction of scientific communications involves the emergence and re-creation of disciplinary, and ultimately, theoretical boundaries that simultaneously narrow (external) ontological complexity while expanding (internal) epistemic complexity. This process of differentiation has advantages for facilitating communications and knowledge, but also carries limitations: as each discipline, with its theories, becomes its own milieu, the observation of the “whole” becomes increasingly difficult (Morgner and King, 2017: viii).

In time, an advanced degree of internal differentiation has enabled science to perform three types of observation simultaneously: towards the overall system of which it is part of, towards systems in its environment, and towards itself, three possibilities Luhmann denominated *function*, *performance*, and *reflection* (Luhmann, 2013: 96). This involved the emergence of scientific communications concerned with science’s role in society, of first-order theories addressing problems in science’s environment (be this the natural world, the aesthetic world, the international system, etc.), and of second-order theories exploring science’s conditions of observation, internal coherence, and historical contingency. These types of observation could be performed by specific disciplines (for instance, by philosophies, sociologies, or historiographies of science), or by sub-fields and sub-theories within disciplines (i.e., reflexive sociology, IR feminism, critical security studies, etc.).

In this sense, Luhmann considered that sociocybernetics enabled sociology – as the main discipline tasked with theorizing society – to recognize that “everything that is communicated is communicated in society” (Luhmann, 1994a: 21), and transcend the dyad of an analytical sociology of social action, where the system is a derivative of the action of its members, and a structural sociology of social systems (Dawe, 1970; Habermas, 1988: 41).[[10]](#footnote-11) This, in his view, was the programme of a “second sociology”, a reflexive sociology that could theoretically observe its social location and patterns of differentiation as an object of theorization, accepting that it was both a “science of the social system and a social system of science” (Luhmann, 1994b: 133).

These ideas provide a relevant point of application for the sociology of IR, as they suggest that the structure of communication and theorizing within a discipline configures how this observes the world and itself, setting the basic epistemic distinctions through which external and internal complexity may be constructed, managed, and recreated (Rosenberg, 2017: 94). More importantly, sociocybernetics indicates that the distinction between performance and reflection, between first- and second-order theorizing, takes place within science and its subsystems, not outside of it. This means that the pattern of internal differentiation between theories not only imposes systemic constraints on the possibilities of observation of both performance and reflexive theories, but also structures the relationship between the two modes of observation. Mainly, if theoretical communications within a discipline are arranged hierarchically, some sort of meta-coherence is possible. But if theoretical communications are differentiated functionally, this is not necessary. The next section applies this to IR to argue that its observational/theoretical boundaries have both widened and differentiated as a response to problems of observation. This reading is used to outline a SOC sociology of IR that avoids the traps of reflexivity while engaging with the limitations of observing society from within.

## IR Theorizing in Sociocybernetic Perspective

### Looking Out: Problems of Performance

From a sociocybernetic perspective, it is striking the extent to which IR’s paradigm debates have, often in rather explicit fashion, revolved around problems of observation concerned with the position of theory against its external object, “the international”. The general acceptance of the complex character of the international domain gave early theoretical discussions a strong first-order overtone, as the international order was largely conceived as ontologically isolated from (and superior to) IR theorizing, so that “International Relations [were] not to exist, international relations would still be seen rather much as they are now – and always have been” (Onuf, 2013: 16). Thus, theoretical discussions during the fifties and sixties tried to simultaneously outline the foundations of a new IR theory distinct from other disciplines such as history, law, and political science,[[11]](#footnote-12) and to specify the basic position from where IR, as an observer, could capture the fundamental dynamics of the international system as a whole (Guilhot, 2008: 300; Rosenberg, 2016). The preoccupation with carving an autonomous domain for a new scientific discipline assumed the form of a recurrent “problem of boundaries”, found in numerous theoretical commentaries to this day: how and where to establish the limits of IR theory in relation to the world it observes (Albert and Buzan, 2017).

This problem was at the core of the second debate: often characterized as posing positivists against interpretivists, the debate actually involved quite elaborate discussions regarding how IR, as a theory, should epistemologically, theoretically, and methodologically position itself in relation to the complexity of its subject matter (Guilhot, 2011; Knorr and Rosenau, 1969). Hence, those said to represent the “science” camp posed that IR should adopt a reductionist epistemology to isolate the basic properties and systemic boundaries of the international system, to enable generalizable knowledge, minimize normative and philosophical speculation, avoid over-contextualization, and transcend the dead hand of history (Alker, 1966; Deutsch, 1960; Kaplan, 1957, 1966; Young, 1968). Against this were “traditionalists”, who considered that the separation between internal and external variables was impossible as the international domain was a social system, rejecting the generalizations of *system scientism* and attempts to reduce IR theory to methodological definitions blind to the actual play of politics (Aron, 1967; Bull, 1966; Hoffmann, 1959; Wight, 1960). Telling of the centrality the issue of complexity had in these discussions, is that the two camps considered solutions that can be accounted for in sociocybernetic terms.

Thus, one the one side, the reference to system scientism is indicative of the extent to which the science camp involved scholars who, relying on first-order cybernetic ideas, argued that a “scientific” IR had to be a systemic theory. Hence, for Morton Kaplan, J. David Singer, and others, the inter-state was the most appropriate level to make sense of international affairs, as otherwise IR theory would be overwhelmed by the complexity of its environment, unable to distinguish which information to observe against the noise of historical and social phenomena.[[12]](#footnote-13) Raymond Aron (1967: 204), on the other hand, considered that IR theory should remain sociological and historical: rather than aiming to model a basic encoding or structural logic behind the system, it should aspire to develop a “praxeology” capable of theorizing the emergence and implications of the ideological structures “through which men and nations think out problems in international relations, establish their goals, and assign themselves duties”.[[13]](#footnote-14)

Though traditionalist stances were on the losing (or dismissed) side of the debate, at least in the dominantly Anglophone IR circles, establishing the appropriate boundaries of the international order remained a central concern among system-level theorizations of international politics (Buzan and Little, 2000; Jervis, 1997). As a matter of fact, the cybernetic notion of managing complexity by altering the observational position of theory was the central pillar in the most widely-known effort to establish an autonomous IR theory; Kenneth Waltz (1979)’s *Theory of International Politics*. Waltz explicitly understood the reach of his theory in light of the epistemic simplifications necessary to narrow the complexity of the international system, accepting that “the interstate system is not the only international system that one may conceive of” (Waltz, 1979: 38).[[14]](#footnote-15) He was also clear about the cybernetic relationship he saw between boundaries of observation and epistemological complexity: IR theory had to be systemic and parsimonious to protect IR explanations from the complexity of society, from “the autonomous influence of democracy, ideology, economic integration, law, and institutions on world politics” (Legro and Moravcsik, 1999: 6).[[15]](#footnote-16)

From the eighties onwards, reactions against structural realism and its narrow view of the international system (and against system theorizing in general), resulted in alternative proposals on how to manage the complexity of world politics. For some, the issue was that early systemic theories were trying to capture “too much”, preventing IR from “getting things right” and achieving true scientific status (Herborth, 2012: 242). In this sense, one solution was to advance reductionism along behavioralist lines: systemic theories needed correction and grounding in testable hypotheses and empirical research to be more scientific and objective, and abandon truisms and inductive reasoning (Cederman, 1997). The neo-neo synthesis represented this move towards more methodologically-reductive views of an IR science; rather than aspiring to theorize the international system from the top, international relations should be disaggregated into simpler analytical problems to be engaged by bounded low-level IR propositions (Waever, 1996: 163).

A second position considered that systemic and rationalist IR theories were too simplistic, leaving too much society out while failing to account for performance problems appearing with the end of the Cold War: as James Rosenau (1984: 248) commented sarcastically, the world was letting IR theory down. Hence, as the post-war experience supported novel views about international relations away from earlier racial and imperial visions (Vitalis, 2005), the end of superpower politics and the intensification of complex interdependences renewed preoccupations with how IR theory should deal with a globalizing world. The solution then, was to bring more world into IR, generally by questioning two simplifications supporting reductive ontologies and epistemologies of international politics: the anarchical logic of the international system, and the centrality of the unitary state (Adler, 1997; Ruggie, 1998). This entry of the “social” into the international political system assumed different forms over the years, as different theories opened to different social structures, mechanisms, and actors: the economy (World System Theory, IPE), norms and values (Constructivism, English School), non-state and sub-state institutions (Transnationalism, Liberal Theory), identities and language (Critical Theories), and so forth.

As theoretical differentiation advanced, however, the problem of boundaries mutated into what Gerard van der Ree (2014) called the “problem of plurality”. The continuous widening of IR’s epistemic horizons to “[…] (potentially) encompass all of human activity” (Dunne et al., 2013: 417), and the co-existence and stabilization of different schools and theories with non-coherent definitions of the IR universe, generated epistemological and ontological anxieties in terms of the status of IR as an objective science, its relative position against other social disciplines, its political relevance, and its survival as an independent field of study (Baron, 2014; Buzan and Little, 2000; Checkel, 2013; Halliday, 1996; Keohane, 1988). Proposed solutions to the plurality problem hence intended to re-constitute some type of unifying perspective, either at the ontological level of reality, or the epistemological level of theorizing. Van der Ree (2014) carefully mapped the epistemic strategies used by theorists to do this over the last three decades, ranging from the zero-sum logic of “bad science” arguments and the “extending the hand” reformulation of neo-positivism, to the “seizing the middle ground” of *via media* constructivism, and the epistemological “regrounding” offered by critical realism and other hybrid theorizations recognizing the layered subject matter of IR. All these strategies, he noted, operated on the basis of different “lines of inclusion and exclusion” (van der Ree, 2014: 231), from narrow selections intended to leave certain communications outside “proper” IR, to inclusive ones that widened observational boundaries or tolerated multiple epistemologies and theoretical perspectives.

This rapid review of IR’s first-order dealings with the problem of complexity points to two relevant sociocybernetic caveats. The first is rather evident: observations about the state of IR theory did not proceed from first-order theorizing. Rather, they involved the adoption of a second-order standpoint – in the form of grand theoretical, meta-theoretical, or philosophical reflections – that allowed observing and communicating about IR as a system. The second is that, in doing so, problems of boundaries and plurality could be separated from the ontology of the IR world, and re-directed inwards, towards the epistemology and sociology of IR theorizing.

### Looking In: Problems of Reflection

A similar dissatisfaction with reductionist and state-centric conceptions of IR fueled the “theoretical effervescence” of critical and “dissident” scholarship (Lapid, 1989: 238). Drawing from alternative post-positivist epistemologies, from post-structuralism and gender studies, to sociology of science critiques, these theorizations promoted a second-order perspective that underlined the social “mode of existence” of theory, theorists, and their objects (Mannheim, 1936: 166), and the mutual reflectivity between the level of action of international relations and the level of observation of IR theory (George and Campbell 1990; Linklater 2001; Zalewski 2007). The focus on the IR observer conduced to an alternative treatment of the problem of observation, as questions about performance and correspondence *with* the world, gave way to questions of reflexivity concerned with how to reconcile the social situatedness of IR theory with the production of “genuine knowledge”, to enable second-order observations to return *to* the world (Hamati-Ataya, 2013; Tickner, 1997: 620). In this sense, the problem of reflexivity presented two related theoretical challenges: to establish a perspective for critique that avoided a “view from nowhere” (Jackson, 2008: 151) and prevented falling into a reversed positivism “which denies the social construction of values while asserting the social construction of facts”, while keeping critical observations within the communicational system of science, as theoretical and even methodologically-informed communications systemically distinct from those produced by other knowledge-producing systems – be these other disciplines, the arts, journalism, and “non-critical practices of social engagement” (Hamati-Ataya, 2013: 682–685).[[16]](#footnote-17)

Hence, Gramcians such as Robert Cox (1981) accepted that even when a certain degree of utopianism ought to be present in critical theorizing, a sociological understanding of historical processes should *constrain* normative choices to “feasible” transformations of the existing world. A similar point was recently made by critical realists such as Milja Kurki (2015: 786), who argued that a “situated IR” still requires some methods to stretch its imaginative horizons and acquire a “more objective although not ‘objectivist’ knowledge”. Poststructuralists and postfoundational authors, on the other hand, abandoned the search for systematicity to embrace positionality and difference: rather than aspiring for a unifying perspective, reflexivity involves the recognition of the contingency of theorizing and the multi-faceted nature of the social experience. In the words of Sylvester (2013: 325), “the task is to negotiate reasonable paths that can incorporate researcher positions and those of hybrid others without determining which differences lie beyond feminist foundational thinking and its post-foundational now”.

In both cases, and leaving aside the hardest edges of Marxian structuralism and poststructural relativism, it can be argued that IR critical approaches have tried to manage the problem of reflexivity by way of an emancipatory solution.[[17]](#footnote-18) In more foundational schools, this has assumed the form of a normative transcendentalism, commonly along Habermasian lines, where certain discursive forms and rationalities provide “a privileged normative locus from which the dynamics of functional integration and the system’s evolution towards increasing social complexity can, in principle be criticized and kept under control” (Habermas, 1984; Knodt, 1994: 95). This allowed “grand narratives that consider the ambiguities of human interconnectedness” to inform ethical dispositions (Linklater 2009: 491), while linking these dispositions with specific *lifeworld* proxies (i.e. global civil society, world society, cosmopolitan democracy, etc.) representing a benchmark from where to criticize mainstream IR epistemologies, theories, and institutions (Chandler, 2004; Dryzek, 2006; Habermas, 2008; Held, 1995). For “Anti-Platonists”, instead, the normative commitment is towards “an ethics of sensitivity to difference” (Fluck, 2010: 264), conflating research practices with an ethics that avoids the hierarchies, rationalities, and marginalizations embedded in reductive knowledge claims (Ackerly and True, 2013; Taylor, 2012).[[18]](#footnote-19) Here, the problem of reflexivity is in principle left open, but progress is made by increasing the awareness the researcher/observer has for its social, theoretical, and normative positionality.

However, neither normative transcendentalism nor positional awareness have prevented the fragmentation of critical schools, on the contrary. It could be argued that, just as first-order IR theories responded to the widened ontology of the IR system by highlighting particular performance problems (security, regimes, norms, etc.) and observational perspectives (the system, the state, the individual), second-order IR theories have responded to the expanded ontology of the IR observer through distinctions that underlined specific normative, meta-theoretical, and praxeological concerns, and particular socio-semantic distinctions, such as gender or colonial relations (Grenier, 2015; Hamati-Ataya, 2011a; Kurki, 2011). The increasing differentiation of reflexive perspectives, however, did enable the emergence of second-order reflections that instead of *bending back* towards the position of the observer, bent *outwards* towards the sociology of observation.[[19]](#footnote-20) Through this, the argument can return to the puzzle outlined at the beginning of the article, as IR’s dealings with the problem of observation and self-observation come to converge with the program of the sociology(ies) of IR.

## A Second Sociology of IR: Reflexivity and Differentiation

The agenda of a reflexive sociology of IR has recently expanded via encounters with the work of Pierre Bourdieu, his theory of habitus, and his analysis of the *homo academicus* (Bourdieu, 1975, 1988), which have provided a framework to link an empirically-situated and socially-structured understanding of the practices producing IR knowledge, with the epistemic structuring of the IR world (Adler-Nissen, 2013; Bigo, 2011; Bueger and Gadinger, 2015; Nexon and Neumann, 2017). Moreover, this “practice turn” has resonated with pragmatist and relational approaches (and philosophical ones such as critical realism) focusing on the socio-material relations bridging the inter-subjective world of IR meaning and the objective world of IR action (and objects) (Friedrichs and Kratochwil, 2009; Hamati-Ataya, 2017; Kurki, 2007; Nexon, 2010). Though a comprehensive positioning against sociologies of practice cannot be developed here, we consider that a sociocybernetics-informed sociology of IR complements these approaches by illuminating their blind side.[[20]](#footnote-21) Instead of treating theories as outcomes of practices that actors perform, reconstituting a subjectivist ontology and an emancipatory project, a central aspect of Bourdieusian thought (Susen and Turner, 2011),[[21]](#footnote-22) sociocybernetics treats them as communicational structures and inquiries about their conditions of reproduction independently of their inter-subjective substrata. Thus, while relational sociologies can be said to flatten *ontologies* to reveal their praxeological construction, a sociocybernetic-inspired one flattens *epistemologies* (and theories) to observe their socio-epistemic functioning, irrespective of correspondence judgements, normative implications, or empirical applications.

The starting point for this second sociology is the type of communications IR produces and tolerates. In this regard, three features explicitly emerge from the analysis in the previous section. The first is that, despite debates, critiques, and anxieties, the semantic reach of IR communications in terms of performance (the world observed by IR) and reflection (the observations IR makes about itself), has undoubtedly widened: as a discipline, IR *sees* much more than it used to. Second, even if North American institutional dominance over the field continues, the theoretical and methodological pluralism of IR has advanced, with little evidence of a realist/rationalist/institutionalist dogma managing to narrow or order theoretical diversity (Turton, 2015). Third, neither this expansion nor this pluralism have affected the reproduction of IR communications, which proceed without need of inter-theoretical agreement, methodological consensus, or normative integration (Jahn, 2016; Wight, 2015).

Sociocybernetics can account for these features rather straightforwardly. Rather than considering it a problem, theoretical diversification emerges as both a consequence of IR’s reproduction as a scientific sub-system and as the condition of possibility for its adaptation: theories are the organized complexity the IR system produces. Indeed, many theorists have related IR’s epistemic flexibility with the way its theoretical paradigms are ordered. Stefano Guzzini (2013: 533), for example, considered that IR evolved into a stratified arrangement composed by different levels of theorizing that “no science can afford leaving one of them out”. Accordingly, he distinguished between early-emerging empirical and ontological theories, such as Machiavelli’s or Morgenthau’s, dealing with inductively-driven research agendas and the identification of constitutive ontological concepts, and later higher-order normative and meta-theories, engaging with philosophical and abstract aspects regarding ontology, epistemology, and methodology.[[22]](#footnote-23) Patrick Jackson (2011), on the other hand, proposed that IR theories were structured according to four philosophical-ontological “wagers”, each of which *worlding* differently, so that theoretical disputes “can never be settled definitively” (Jackson, 2011: 34–35).[[23]](#footnote-24) Ole Weaver (1996), and later Buzan and Albert (2010), referred directly to Luhmannian notions to pose that IR theoretical paradigms, even if hierarchically structured internally, had functionally differentiated in relation to each other. Accordingly, theoretical paradigms function according to their own inner logics, so that even if observing each other and relying on similar heuristic references, each produces alternative onto-epistemological realities that do not compete “for explaining ‘the same’” (Waever, 1996: 174).

This internal patterning, sociocybernetics indicates, is crucial to understand the systemic operation of the IR system and the epistemic functioning of its observations. Hence, if IR is stratified, this means that performance and reflection issues may be ultimately reconciled, providing, in principle, a point of meta-theoretical simplicity from where to steer both IR theoretical engagement with performance problems, arbitrate second-order disputes, and establish normative horizons. Mattern and Zarakol (2016), for instance, recommended that IR theory should shift to hierarchy-centered approaches (instead of anarchy-centered ones), arguing these provided a superior framework to theorize world politics as a global system, as it allowed to reconcile different theoretical schools with alternative but complementary logics of power. However, if IR theories are functionally differentiated, this type of reconciliation is not possible, as each theoretical paradigm observes the world, and itself, according to its own selections. Normative theories, for example, can only but observe from the perspective of an ethics – that is, as a theoretical reflection of morality – that continuously (re)produces ethical problems, so that “…even successes in addressing moral dilemmas, indeed by virtue of that very success, breed new moral contexts that thus challenge humanity with novel moral dilemmas. In that sense, morality is always a ‘problem’” (Price, 2008: 215).

Therefore, when Waever (1996: 155) stated that IR “was the debate”, he was pointing to two non-trivial sociocybernetic aspects of the observation of IR as a whole: that due to differentiation this whole could only be observed as the difference across positions, not as a unity, and that the observation of the difference took place within IR, not above it.[[24]](#footnote-25) This means that second-order theories can see fragmentation and even envision potential syntheses, but these observations and solutions are produced within a pattern of internal differentiation where no meta-language connects competing systems of intelligibility (Michel, 2013: 287). While rejecting the prospect of unity may be something many reflexive scholars may not willing to accept, sociocybernetics indicates that the “boundaries of irrelevance” (Scharpf, 1991: 297) separating functionally-differentiated theories are what grant the IR-theory-system its capacity to operate beyond problems of observation and self-observation (of plurality, of values, of self-referentiality, etc.). Mainly, functional differentiation prevents internal contradictions from “blowing back” and blocking the reproduction of IR communications – for instance, if analytical considerations were not to meet normative requirements, or vice versa.[[25]](#footnote-26) The price for this flexibility is that theoretical observations, either of first- or second-order, do not irritate each other in their own terms, and there is no guarantee of consistency (Wight, 2015: 74). Hence, while critical and reflexive theories can point to and problematize IR’s historical, normative, and epistemological contingency, they cannot make first-order theories care about these arguments, or engage with them as they would like to.[[26]](#footnote-27) Neither noting asymmetries in IR knowledge can make more inclusive IR theories emerge, nor guarantee that if they were to emerge, they would do so according to desired requirements: complex differentiated systems cannot respond as a whole (Knodt, 1994: 98).

In this sense, both first and second-order theories are “boxed in” by the very functioning of IR as a scientific system, and by their location within specific subfields and theoretical paradigms (Tickner, 2013).[[27]](#footnote-28) This very article was written in accordance with the patterned communications of IR theorizing, and will be given meaning and circulated according to these structures, being interesting to some, and irrelevant for others. From this perspective, it also becomes clear why IR fails to control itself: lacking a top or a center, the steering and coordination of highly-differentiated social systems, be these political, economic, or scientific, is highly problematic (Luhmann, 1997): Colin Wight (2015: 72) called IR a “fragmented adhocracy”, a system of communication with no centre, sustained only by its own controversies.

Sociocybernetics can thus elaborate the socio-heuristic possibilities and constraints faced by second-order theories, a point often overlooked in critical IR approaches. These possibilites constituted a point of disagreement between Luhmann and Ulrich Beck: while accepting the premise that modern society was highly differentiated, Beck maintained a Habermasian stance, considering that a reflexive social theory could perform a critical role by disassembling functional differentiation, opening intra-systemic closures, and generating hybrid communications better suited to understand the “international intercultural conflict dynamic of world risk society” (Beck, 2009: 17). This is a consideration found in many critical, reflexive, and sociological arguments in IR, posing that many of the problems of observation IR has, would be resolved if this were to abandon rigid ontologies of the international, reductive epistemologies of science and knowledge, and narrow anthropocentrical ethics (Reus-Smit 2012; Youatt 2014; Pin-Fat 2013; Baron 2014; Rosenberg 2016). Functional differentiation means that this is not so simple, as the problems of observing complexity can never be fully solved, only modified by changes in perspective that alter certain boundaries while producing others, creating new simplicities, complexities, and observational filters. New “IRs” premised on the notion of “societal multiplicity”, as suggested by Rosenberg (2016), or on posthumanist grounds, may well be able to transform the restrictions embedded in state-centric views of the international system and dualist views of society. However, as noted by early IR system thinkers, wider or alternative epistemic boundaries demand new selections to manage the complexities of enlarged ontologies and epistemologies, generating new pressures for differentiation, and new first- and second-order problems. For instance, in their discussion about a posthumanist IR, Cudworth and Hobden (2013: 445) noted that the flat, non-hierarchical networks proposed by Actor-Network Theory could not deal with power because this theory “…cannot make distinctions between nature and society, or, for that matter, between humans, other animals, plants and objects. In theorizing power, we need such distinctions”. Similarly, Chandler (2014: 453–54) warned that theorizing the world as a complex system required moving beyond liberal-internationalist understandings of good and evil, as in a situation where “the subject is no longer seen as the conscious or intentional initiator of the world, but rather ethically confined to reflection upon the world that exists”, it is no longer tenable to assume isolatable discourses of moral responsibility and freedom. These considerations do not make the search for new theoretical horizons meaningless, as this is the process through which IR generates its own future possibilities, but underline that IR theorizing largely occurs within a differentiated structure where “any attempt to designate a unity requires new distinctions, and in turn, renders the ultimate goal invisible” (Luhmann, 1994a: 23).

By theorizing IR as differentiated self-reproducing social system, a sociocybernetic understanding flanks the two observational traps faced by IR sociologies. On the one hand, such a conception of observing systems and their communications avoids associating the reflexivity of observation and theorizing with a higher perspective premised on the awareness theorists have of their normative and social commitments, as this awareness also has to re-enter society, science, and IR as structured communications.[[28]](#footnote-29) On the other, sociocybernetics dissolves the ontological basis of the sociological trap, by rejecting assumptions about a world independent of observation: the world of states, of classes, of human agents, of moral dilemmas, of IR paradigms, in their complexities and simplicities, is always a theoretical world produced from within (even if constantly irritated from outside). Rather than taking a methodological or normative position on these matters (but admitting that some subsystems of IR can do so through their selections), a sociology of IR communications sets to describe theoretical structures, and their ‘criteria for good and bad, true or false, rational and irrational, functional or dysfunctional’, as communicational products (Luhmann, 2013: 343). This recognition opens the way to a more careful systemic understanding of the social location and circulation of IR theories, both in relation to each other and to other social systems, while enabling the sociology of IR to become truly reflexive, insofar as it can theorize the differences and unities it observes as products of its own social functioning.

## Conclusion

This article claims that a sociocybernetic perspective contributes to approximate different sociologies of IR, extending a theory of social systems to the operation of IR as an observing system. As argued, the search for a perspective from where to balance the complexity of the world with the complexity (and simplicity) of theory, has been a major driver in the evolution of IR thinking, for “a mode of reflexivity that can both contribute meaningfully to essentially contested policy debates on the one hand, and yet be deeply self-reflexive on the other: that can keep ‘the world’ at bay, when it threatens to become ‘too much with us’” (Barder and Levine, 2012: 600). This could be a more pressing concern now than at the time of Luhmann’s writings, as one of the challenges facing contemporary society is that unprecedented levels of information exchange and connectivity have made it increasingly dependent on complexity-filtering processes that may not be conducive to “better” knowledge, politics, or stability.

The article suggests that this search for a balance might not bear the fruits some critical positions expect, but still considers that there is major theoretical and reflexive value in adopting, if not a sociocybernetic view, at least a sociocybernetic sensibility to the heuristic functioning of social structures and systems, including knowledge-producing ones. Luhmann posed that a SOC-informed constructivism was the adequate epistemology for a highly-differentiated science dealing with a complex world society, given that this type of science, because of its configuration, would produce problems that could only be seen from a second-order perspective (Luhmann, 1990b: 81). The contribution of sociocybernetic ideas to the sociology of IR therefore, would not be to solve the problems of observation theorizing produces – complexity, ultimately, has no solution, as it follows from the limitations of the observer – but to explore how these problems emerge from the selective observation of a world that is epistemically open and epistemologically undefined (Aron, 1967: 195), and the consequences of adopting, dissolving, and reconfiguring these selections. If there is a value in this, it is to provide a framework that turns IR observations and theories into social contingencies, in a manner that facilitates the reproduction of theoretical inquiry and second-order reflection, and that opens new avenues of problematization and research. In this sense, the proposal inclines towards von Foerster (2003: 282)’s Constructivist Ethical Imperative: “I shall always act so as to increase the total number of choices”.

At the same time, this sociological perspective acts as a warning, pointing that reflective theories do not see more or better, but rather less and differently. Less, because the complexity of these theories must be necessarily lower than the complexity of their observed ontologies, and even of the first-order theories that directly observe these ontologies (as the observer of the observer cannot observe what the latter observes). Differently, because these simplifications enable the observer to see parts and wholes that are “always differently possible” (Luhmann, 2013: 331). Hence, a sociology of IR along these lines would be able to scrutinize its dual functioning as both *science*, a research program within the scientific system, and *theory*, a reflection about world society (Arato, 1994: 136). If anything, this would allow IR to problematize its search for higher, better, or fairer perspectives from where to steer the world (and itself), and to engage with its social situatedness with greater humility, and less disciplinary *angst*.

On the more applied level, sociocybernetics raises a set of interrogations about the relationship IR as a complex observing system has with other systems beyond and within its boundaries, with the concepts of function, performance, and reflection implying three questions the sociology of IR could ask to steer its investigations about the production and reproduction of IR communications: i) How IR enters the world? ii) How the world enters IR? and iii) How IR enters IR? This type of questioning, already at play in different strands of reflexive and relational research, calls for a more systemic exploration of the socio-heuristic production and reproduction of IR communications in society, the specific coupling IR theories have with other systems in their environment, and the process of by which IR theories order themselves in time. This involves well-known geo-political, geo-epistemic, and linguistic asymmetries at play in the structuring of IR knowledge and practices, but also wider socio-heuristic, socio-technical, and praxeological processes by which IR-as-a-system filters noise and complexity, establishes priorities, and produces simplicities.

For example, questions of function could be extended beyond conventional preoccupations with policy relevance (i.e. observation by the political system) or disciplinary influence (i.e. observation by other disciplines), towards IR’s coupling with other differentiated and organizational systems – for instance, the linkage certain hard sciences developed with technological, military, and economic applications is central to understand the consolidation and expansion of these fields in the 19th and 20th-century (as was the case with early cybernetics). Lacking these linkages, IR appears to be much more dependent of its structural coupling to the educational system (and with the publishing industry, to a smaller extent), and with the capacity certain universities in certain core countries have to attract new students and produce new scholars, and scholarship (Waever, 1998). Questions about performance could complement problem-solving concerns with more systemic analyses of the mechanisms through which IR filters the world and how certain events and issues become problems worthy of IR attention, while others are not. Given its looser linkages with systems such as the economy or technology, it is unsurprising that IR has mostly a reactive stance against rapid developments in these spheres. Lastly, the third question concerns with the processes through which the discipline orders itself. Here as well sociologies, historiographies, and genealogies of IR have already made important contributions, but to a certain extent, they have also served to perpetuate the vitality of certain ideas: much of the contemporary relevance of the realist-rationalist mainstream could be said to follow from its recurrent use as a counter-point for critical arguments. A sociocybernetic-informed sociology of IR could put greater focus on alternative socio-technical mechanisms at play in the management of IR’s internal complexity, particularly as its communications expand and accumulate over time. This involves not only studying how and why certain theories, ideas, and findings are prioritized and remembered, but the blindspot of this actualization process: how and why certain theories and ideas are discarded and forgotten. Again, socio-technical systems managing temporal complexity seem to increasingly relevant: from publishing and translation, to digitalization and the ranking algorithms of Google Scholar.

In summary, by engaging with sociocybernetic ideas reflexive IR would be forced to account for the production of its selections and exclusions within an ontology that cannot be simplified nor denied, and an epistemology that can neither be transcended nor universalized. This type of reflexive theory has to find “the ultimate guarantee of the relation of its cognition to reality solely in the facticity of its own operating and in the insight that this is quite impossible without highly complex prerequisites” (Luhmann, 2013: 330). This, it can be argued, would bring IR somewhat closer to the complexity of the world it aspires to know, without underestimating it as a system nor overestimating itself as an observer.

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1. Hamati-Ataya (2011: 277) referred to the challenge of reflexive understanding as recognizing that the “epistemological claim that knowledge and reality are *mutually constitutive* is equivalent to the ontological claim that knowledge and reality are *mutually reflective”*. [↑](#footnote-ref-2)
2. Defined as “the science of control and communication” by Norbert Wiener (1948), there are multiple definitions of cybernetics, see Von Foerster (2003: 288). Moreover, the history of cybernetic ideas is as interesting as it is intricate, and only some general notions can be presented within this article: historian Andrew Pickering (2010: 3) wrote that ‘‘One could almost say that everyone can have their own history of cybernetics”. For comprehensive genealogies of cybernetics in the Soviet Union, Britain and the US, see Gerovitch (2004), Pickering (2010), and Kline (2015), respectively. For cybernetic influences in different fields, see Bousquet (2009), Halpern (2014), and Hayles (1999). [↑](#footnote-ref-3)
3. Though some authors treat all social applications of cybernetics as sociocybernetics, my narrower specification aligns with the one in the 2001 International Encyclopaedia of Social and Behavioural Sciences, see Kline (2015: 242). [↑](#footnote-ref-4)
4. Deutsch, one of the earlier promoters of the use of statistics in IR, conceived society as a “[…] seamless fabric of information structure’ where ‘the more complex and readjustable the constituent parts of a society become, the greater the coherence and freedom of its subassemblies, the greater should be society’s possibilities of itself achieving greater coherence and freedom” (Deutsch, 1951: 251). [↑](#footnote-ref-5)
5. The fall of cybernetics as an intellectual paradigm is as complex as its origins. The isomorphic properties first-wave cyberneticians established between non-trivial systems resulted in problems of theoretical application and empirical verification, while systemic and structural inferences started to be viewed as unscientific. However, authors such as Pickering (2010) and Kline (2015) mention other factors, from the loose disciplinary and departmental identity of cyberneticians, to new complexity paradigms, changes in academic and military funding, anti-Soviet posturing in US academia, and bastardization by appropriation by science fiction and counter-cultural circles. Nonetheless, authors note that this decay did not involve the complete abandonment of cybernetics insights, as many became embedded in different fields under different names. [↑](#footnote-ref-6)
6. Kline (2015: 198) mentions that when von Foerster presented SOC in scientific conferences, many “did not like his challenge to scientific realism and thought he was a charlatan”. [↑](#footnote-ref-7)
7. For a primer on Luhmann’s systems theory, see Morgner and King (2017). [↑](#footnote-ref-8)
8. Herbert Simon noted this two-way relationship when stating “I shall not try to settle which is chicken and which is egg: whether we are able to understand the world because it is hierarchic or whether it appears hierarchic because those aspects of it which are not elude our understanding and observation” (Simon, 1996: 208). Wolfgang Pauli ([1950] 1994: 41), one of the fathers of quantum mechanics, also nuanced the relationship between the observer and the world: “[…] the concept of consciousness in fact demands a cut between subject and object, the existence of which is a logical necessity, while the position of the cut is to a certain extent arbitrary”. [↑](#footnote-ref-9)
9. Hence, complete knowledge is theoretically impossible, as existing knowledge and new observations interact to constantly produce new knowledge (Geyer and van der Zouwen, 1991: 86). [↑](#footnote-ref-10)
10. In the seventies, these positions defined the “two sociologies” debate, a debate with evident parallelisms in later IR theory. Habermas viewed historical sociology as an intermediate stance that recognized both the systemic nature of society as well as the structural complex of “developmental tendencies” conditioning the trajectory of social structures. [↑](#footnote-ref-11)
11. An “international theory” that was described as “[…] scattered, unsystematic, and mostly inaccessible to the layman. Moreover, it is largely repellent and intractable in form” (Wight, 1960). [↑](#footnote-ref-12)
12. IR should still remain aware of “all boundary factors that may produce dynamic change in the nature of the international system” (Kaplan, 1961: 475). [↑](#footnote-ref-13)
13. Aron mentions that the suggestion of a link between theory and practice ‘shocked’ American scholars, such as Henry Kissinger (Ibid.: 189). IR debates will take almost fifty years to return to this point. [↑](#footnote-ref-14)
14. “We might therefore try conceiving political systems in ways compatible with usage in systems theory and in cybernetics” (Waltz, 1979: 39–40). [↑](#footnote-ref-15)
15. Because of this P. T. Jackson and others have emphasized the *analyticist* nature of Waltzian theory, a point often overlooked by both critics and supporters (Jackson, 2011: 151). [↑](#footnote-ref-16)
16. As Morgenthau said (in rather Luhmannesque fashion): ‘Science is theoretical, or it is nothing’ (quoted in Onuf, 2013: 7). [↑](#footnote-ref-17)
17. The former because it ultimately converges into a reductionist encoding based on production relations, the latter as it abandons pretentions for systematic and scientific knowledge. [↑](#footnote-ref-18)
18. Critiques against Habermasian uses in IR have underlined the linkage dialogic politics has with Western rationalism, liberal identities, and modernist aspirations to totality (Diez and Steans, 2005: 135). Normative transcendentalism was at the centre of Luhmann’s debate with Habermas: Luhmann was critical of the modernist *telos* engraved in liberal, Marxist, and critical projects which he saw aimed at the complete self-realization of reason under the guidance of philosophy, while situating the idealist subject as the centre and purpose of modern society (Luhmann, 1994a: 17). For a primer on this, see Blühdorn (1999). [↑](#footnote-ref-19)
19. For Luhmann, this represented “third-order” perspectives that conceptually did not differ from second order ones, as the observer of the observer is also ‘in’ society (Luhmann, 2013: 328) [↑](#footnote-ref-20)
20. See Guzzini (2004) and Albert, Kessler and Stetter (2008) for general contrasts between these positions. On the more philosophical side, Mingers (2014) discusses systems theory against critical realism, while Joseph and Kurki (2018) outline complementarities between the latter and practice theory. [↑](#footnote-ref-21)
21. “When sociologies of the discipline are *aware* [my emphasis] that they are reconfiguration moves themselves, they have a transformative capacity. This implies that investigations have to be conducted in an ethical way…” (Bueger, 2012: 102). [↑](#footnote-ref-22)
22. Arlene Tickner suggests that these levels of theorizing are subsumed under a broader core-periphery structure, where grand narratives and high IR theories are produced by scholars in the US and Western Europe (Tickner, 2013). [↑](#footnote-ref-23)
23. Though Jackson did not explore the process behind the reproduction of the wagers, he speculated that a “fractal” process seemed to be at play: new selections and epistemic spaces emerged from the deepening and eventual intersection of different theoretical commitments and communications, producing “a finer-grain distinction between the stances along their adjacent boundary – but a finer-grain distinction in which commitments are shuffled and recombined in ceaselessly novel ways” (Jackson, 2011: 211). [↑](#footnote-ref-24)
24. “[…] IR scholarship that engages with the sociology of the field (and other social sciences) is not *inter*disciplinary as much as it is, properly speaking, *intra*disciplinary” (Hamati-Ataya, 2011b: 281). [↑](#footnote-ref-25)
25. As total understanding is not a condition for communication, this resolves the problem of incomensurability that “Anglo-Saxon minded social scientists” find so troublesome (Waever, 1996: 171; Chernoff, 2013). [↑](#footnote-ref-26)
26. This is evidenced in the difficult exchanges first- and second-order IR theorists have had over the years (Moravcsik, 2010; Weber, 1994; Waltz, 1986). [↑](#footnote-ref-27)
27. Zalewski (2007: 310) reckoned that the installation of feminist arguments in academia, “obliges” the production of knowledge in recognisable disciplinary ways for it to be understandable. [↑](#footnote-ref-28)
28. Michael Mann (2012: 8) referred to science as an anomalous form of knowledge: it has “emergent properties in increasing the collective power of human groups, but it has very little distributive power, as it places itself at the service of those who wield other sources of social power”. [↑](#footnote-ref-29)