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Power Without Agents? A Theoretical Analysis of Power in a Complex and Globalized World

Davis Cutter
Union College - Schenectady, NY

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By Davis Cutter

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ABSTRACT:

What is power? Traditionally, power has been theorized through a lens of agents, their intentions, and their inter-relations. In fact, theorists of late have neglected the notion of power, abandoning it as dispensable, unable to legitimize or explain human action beyond "who has power over whom." My thesis extends beyond this claim by exploring the concept of power, but relaxing the assumption that it always derives from agents. Although agents are still actors in, and contribute to non-agentic power, the concept is still distinct from traditional notions of power. Rejecting these traditional notions, this thesis suggests power can be found beyond or outside of agents. In other words, systems with complex interconnectivities contain emergent units that produce elements of non-agentic power. Drawing from recent sociological literatures on systemic risk and emergence, my research finds that there are four theoretical elements of non-agentic power: nonlinearity, intentionality, collectivity, and power-source. These elements are outlined in Chapter 3. After defining the structural aspects of non-agentic power, the thesis will explore how non-agentic power arises through emergence and emergent units. Rejecting traditional reductionist theories, non-agentic power is highly complex, and therefore can only be reduced to collective, emergent social properties.

Notably, non-agentic power is closely related to other terms, like complexity, complex systems, and systemic risk. Though each term overlaps, there are crucial differences between power, complexity and risk. These contrasts will be highlighted in

Chapter 4. Subsequently, Chapter 5 will provide further empirical examples of complexity, complex systems, and systemic risk within the Internet of Things; these examples will contextualize the debate on "what is power?", ultimately concluding that power can indeed be non-agentic.

The objective of this debate is not to spark a philosophical quandary over how the human condition operates – although this discussion is certainly welcomed. Instead, this piece aims to illuminate the hidden dimensions of power, which are ever-present in today's globalized world.

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Chapter 1: An Introduction to Power and Agents

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The U.S. housing bubble burst in 2008, causing a global financial crisis. Certainly the failure of the housing market can be pinned on a multitude of interrelated factors: the rise of housing prices, subprime lending to people that could not afford mortgages, risky investments in mortgage assets, the securitization of mortgages then sold worldwide, and the list goes on. In December 2008, the housing market plummeted, sending the U.S. economy into recession; this failure could be seen as the epicenter of the global financial crisis; the first drop in water which caused a massive ripple effect – one that would create a tidal wave reaching global proportions.

The collapse of Bear Stearns, Lehman Brothers, and AIG shortly followed as signatory consequences of the housing market failure. Particularly in the case of Lehman, its filing for Chapter 11 bankruptcy on September 15, 2008 was a watershed event in the global financial crash; Lehman's failure can be nonlinearly connected to subprime lending by its bankers, and the eventual crash of the housing market. Although there are many factors involved in the financial crash, there is an irrefutable link between the Lehman and housing market failures. This illustrates the domino effect that took place; housing prices fell, banks became scared and suddenly stopped lending, borrowers

defaulted on loans, causing a liquidity crisis, ultimately changing the financial decisions of agents across the world.

And yet, as in most financial crises, there is no single actor one can identify as the culprit. Since 2008 we have been debating: Was it caused by the investment banks that securitized housing mortgages? Or, the rating agencies that under the umbrage of the First Amendment rated these securities as AAA? Or, was it the fault of borrowers who knew they could not afford loans on their houses, or the salespeople who pushed the loans on them? Or, maybe government regulators who failed to pry into the financial transactions? Really, it was the configuration of the network and the particular interrelationships between the actors that ultimately led to the crisis. While there certainly are agents who acted, no single actor can be pinpointed as the "cause" of the crisis. As such, we are forced to make generic statements, like "Wall Street" caused it.

We have seen a plethora of consequences from banking failures caused by the American housing market failure. From a macroeconomic perspective, the global economic crisis started with the aforementioned reasons, and expanded into a broader and systemic issue that affected all agents. For any agent engaged in the market, the systemic risk of the network is inescapably fixed. The housing market crash was a mark of the interconnectivity that included large financial institutions, rating agencies, and money markets the world over.

There is an inherent risk to agents in terms of their interconnectivity within complex systems. As more agents join a system, the more interconnected they become, and thus the probability of systemic risk grows, especially after a tipping point. Sometimes, tipping points can cause monumental outcomes. The American housing

bubble, for example, resulted in a truly global and systemic issue. Even for those who weren't aware of its failure, the breadth of its power reached across seas and borders.

For example, Alexis Cohen was a 35-year-old man living in Greece working as a sound engineer when the recession hit in 2008. Employment plunged as Greece went into deep debt; two years later in 2010, the economy still had not recovered. The failing market was too much for Alexis Cohen, who found himself without work. His clients, singers and musicians, weren't putting on concerts, since patrons couldn't afford tickets (Kitsantonis 2014).

When the U.S. housing market failed, it is likely Alexis Cohen did not blink an eye in Athens. Even when Lehman Brothers failed and the Fed did not bail them out – Alexis still didn't think much of it. But as the systemic failure spread to Europe and to Greece, Alexis started seeing his business decline. In due time, Alexis would be another person struggling from a (nonlinear) connection to the U.S. housing market failure. This interconnected nature illustrates the importance of studying non-agentic power.

* * *

On July 20, 2011, the activist magazine *Adbusters* published an article titled "#OCCUPYWALLSTREET," encouraging its readers to flood lower Manhattan on September 17th in a peaceful protest. Three days later, a retired chemistry teacher named Cindy from Long Island posted one of the first tweets with the hashtag #OccupyWallStreet. Fast forward one month to October 2011: The Occupy movement had spread to 82 countries, making it one of the largest social movements in the past decade, carrying tangible economic and political impacts (Juris 2012).

It is likely that Cindy did not know the magnitude of her tweet in September of 2011, nor did the writers for *Adbusters*. Rather, Cindy was just another agent in a larger network, unknowingly adding to the collective mass of Occupy that would develop. The power of the Occupy movement is nuanced; some of its power is embedded in the hashtag. Jeff Jarvis, professor of journalism at City University of New York, appropriately said, "No one owns a (Twitter) hashtag, it has no leadership, it has no organization, it has no creed but it's quite appropriate to the architecture of the net" (Berkowitz 2011). The hashtag had no leadership, the Occupy movement had no leadership, and there was no clear direction of the campaign. As such, how does one think about the concept of power in Occupy Wall Street, if there are no leaders, no goals, but thousands of participants?

Can we conclude that *Adbusters* or Cindy had power in this situation? Or, does Twitter have power? These reflections would be categorized traditionally, in terms of "agentic" power. But perhaps it is the network itself, the interconnected collective of individuals, which is the locus of power in Occupy Wall Street. If so, then this requires a very different conceptualization of power – one that has no agent, and no intentionality.

For instance, the hashtag contributed to the 'mind' of Occupy that would form – a mind that consisted of a self-proclaimed "99%" of society. Occupy purposefully had no leaders, making the control of ideas, information, and direction highly unpredictable. After Cindy's tweet, the web of participants would grow, globally, to an unbounded capacity. Together, interconnected agents and the complexities of Occupy would constitute a formation of non-agentic power.

Financial crises and social movement reactions to them, like Occupy Wall Street, are not the only examples of non-traditional forms of power that require new conceptualization. Later in this thesis, the Internet will be used as a primary illustration of non-agentic power, including an examination of online social networks. These networks connect people in different places and time zones, bridging communication systems and forming dense, global complexities. While the advantages of agentic relationships and interconnections are many, there are several dangers of interconnectivity, creating systemic risks like financial crashes, computer viruses, and environmental issues.

* * *

What is Power?

Power, in theoretical terms, is a universal extension of humanity; it is an ineluctable mode in which humans exist. In political science, scholars have commonly viewed the study of power from a perspective of "agentic" relations. Agents, defined as actors in a relation of power, can be considered as institutions, states and non-state actors. In these classic perspectives of power, agents are the driving forces that cause actions, choices, and decisions for other agents. Scholars have divided power theories into separate "faces" – traditionally, three or four of them. In an attempt to draw out the essential characteristics of non-agentic power embedded *in* these faces, I will look beyond them to discount barriers between these viewpoints. In doing so, the key attributes of power should overlap amidst these faces.

What is non-agentic power? Are there defining elements of non-agentic power? These are some of the main questions we will be assessing, identifying the key aspects:

nonlinearity, intentionality, collectivity, and *source*. By investigating each of these terms, we will add to our toolbox to analyze power. Although we will go into more detail on these terms later, a description is in order on the four dimensions of non-agentic power used in this thesis.

The first characteristic, nonlinearity, suggests that the effects of an action may not be linearly sequential. Instead, the consequences of an action could be unintended, meaning that two seemingly unrelated outcomes could be connected, nonlinearly. Alexis was nonlinearly connected to the U.S. housing market failure –this nonlinearity is often overlooked in traditional forms of power, but highly evident in non-agentic power.

Second is the aspect of intentionality. In summary, agents forfeit intentions within non-agentic power. Since no single agent can control non-agentic power, agents therefore do not have intentions, goals, or the ability to influence the direction of complex systems. Whereas traditional theories of power place agents and their intentions at the center of their analyses, non-agentic power does not rely on agents and their intentions. For instance, Wall Street firms did not act with the *intention* of causing a financial crisis – something which ultimately lead to their own decline in fortunes. While Cindy and *Adbusters* did have the intention of fomenting social unrest, they certainly had no grand, global vision of a social movement; so hardly can these agents be compared to the roles of Martin Luther King or Mahatma Gandhi – both leaders of social movements with ambitious visions of societal change that were consciously institutionalized in the movement itself.

Collectivity, the third dimension, proposes that the inclusion of many agents in a system or network may result in the formation of non-agentic power. A meeting between

two people is clearly an agentic situation; but a movement involving millions of people, online social networks, innovative ideas, rapid spreading communication, and unpredictability – this collective could amount to non-agentic power. The financial crisis could not, and would not have happened, without the collective involvement of millions of shareholders, stakeholders, financial institutions, and investors.

Lastly, in non-agentic systems, the source of power does not come from agents themselves. Alternatively, the source of power emanates from emergent social properties – groups of agents, shared ideas, and collaborative information contribute to the growing body of non-agentic power. This "power of its own" is in fact, non-agentic, making it an untamable collective. Taking these four dimensions into consideration, we will demonstrate how non-agentic power has been injected into the veins of global systems and, depending on its formation, can evolve into both a steroid and disease.

Agency

A word is in order about "agency." The term agent can be subversive in the context of power. All human beings have the ability to act as a political agent. In addition to people, agents can appear in other forms as well: states, companies, banks, institutions, etc. Political agents, or actors as I will sometimes refer to them, have been examined extensively. The other side of the coin, however, has not been reviewed nearly as much; if political agents are everywhere, what are non-agents? More specific to this discussion on power: is it possible to have something exercise power that is not an agent? This thesis will attempt to answer that question with a resounding yes, suggesting that agents today do not hold, or even *seek* to control, some of the largest aspects or incidents of power in

the world. Rather, power is manifested, evolved, and controlled by what I call *non-agents*: systems where extremely complex conditions present unique ingredients that produce the emergence of non-agentic power. Power, therefore, can be non-agentic.

It is important to note that agents are fixed within agentic and non-agentic forms of power. In agentic situations, agents possess power and are the drivers of events; yet, in non-agentic power, the interconnectivity of agents, or even the network itself, can impact events. This is a stark variation to consider. No longer is there a limitation on the agents, as power expands to something much greater that cannot be captured by a single matter, entity, or word.

Non-agentic power is created by complexity and complex systems, while also related to systemic risk. Still, each has distinct applications. Studying the human anatomy is complex – does this relate to power? Diving headfirst into a pool is risky – but is it a "systemic" risk? Fundamentally, it is the interaction *between* the three concepts that is most pertinent. The human anatomy may be complex, but it does not relate to power, and systemic risks must be reverberated on a large scale, not just a single actor. In non-agentic power, it is the number of agents in a system that indicates the level of complexity. Eventually, the collective group of agents will produce conditions of non-agentic power – and if the quantity of agents gets too big, there could be a "tipping point," which produces a systemic risk. Such is the process and involvement of the terminology.

This thesis will not predict when or how these tipping points will occur – this is no attempt to answer when the next global financial crisis will be. Indeed, it is difficult to determine when a systemic crisis will occur, for how long, and what its power will be. So

what can be done? Admittedly the concept of power is abstract, but the arguments made here are not simply abstractions. There is precedent – the financial crisis, Occupy Wall Street, the Arab Spring, and even global warming – non-agentic power is a growing entity that must be considered in a globalized era. With new complexities comes a new concept of power. As agents continue to collectively produce and interconnect on massive scales, the yield of power must be seen with an innovative perspective. Agents can no longer be the seen as the creators, developers, operators, and facilitators of power– it's time to look beyond.

This discussion on complexity and risk has been analyzed in a related sociological literature. With the recent Ebola outbreak, the global health system witnessed a period of palpable systemic risk from the epidemic. This thesis will not address complexities and risks like Ebola, since they are part of natural phenomena. Ebola was not unintentionally created by a collective group of actors who generated non-agentic power. In fact, Ebola would be a "risk" no matter how interconnected the world was – if one person or five million people were infected. Surely we are at a *greater* risk as a result of the interconnectivity of air travel, health care, and immigration, but this doesn't prove that Ebola is non-agentic power.

As such, this study will focus more specifically on instances of power where there is a strong correlation between power, complexity and risk. Note that in the Ebola example, power was the missing link; agents cannot have "power" in Ebola, transformed by the collective. The illustrations of power we will examine are commonly produced by widespread interconnections, thus revealing its complexities, and ultimately allowing us to assess overall risk. Ebola does not fit in this study; it is not something agents can

collectively produce. Non-agentic power should be assessed in terms of its complexity and risk, not explained by a natural disaster or health outbreak.

To begin, we will first review a history of literature on power, contextualizing each concept in the framework of non-agents. First by defining the foundational aspects of traditional, agentic power, we will then compare each facet and contrast it against my theories of non-agentic power. Here, many of the comparisons will be in comparison to Robert Dahl's theory of power, which has long stood as a bedrock theory of power. Principally, my thesis does not disregard or reject the established hypotheses of Dahl, but rather aims to introduce non-agentic power as an additional domain in power studies, and of supreme importance in the modern age. After addressing Dahl's theory, as well as other established "faces" of power, the thesis will shift to non-agentic power and its four dimensions. By outlining the four dimensions of non-agentic power in more detail, the applications of non-agentic power in the world today will become more transparent.

Continuing our analysis of related terms to non-agentic power, we will apply power to empirical examples in modern technology. Specifically, we will be looking at examples within the present Internet of Things (IoT) in order to identify the nuances between the terms of power. In this consideration, we will identify the importance of studying non-agentic power, as interconnectivity can pose great risk and non-agentic *power* to globalized systems.

Chapter 2: Power – A Literature Analysis

* * *

Although my core findings are related to non-agentic power, they are constructed on the basis of agentic theories. In this literature review, I will first outline the main theories of agentic power. Part II will address the idea of knowledge and power, a staple of Foucault's work and a category that fits *between* agentic and non-agentic power. Lastly, section III will introduce theories that touch on aspects of non-agentic power, which I will relate to my work moving forward.

I. Agentic Power

In order to understand non-agentic power, we must recognize existing theories of power – most of which are limited to agents. Robert Dahl's theory of 'traditional' power came about in the early 1950's; many scholars like Steven Lukes in the 1970's have since layered Dahl's theory by adding different "faces" of agentic power to the debate. Dahl's version of power is often referred to as 'pluralist,' 'compulsory,' (Barnett and Duvall 2005), and 'realist' power. In Dahlian power, there are two actors: A and B, in which "A has power over B to the extent that he can get B to do something that B would not otherwise do" (Dahl 1957, p. 203). Dahl is quite focused on the *relations* between actors; in this sense, relations can create a web of inter-agentic connections.

Dahl uses the example that a regular person, such as himself, cannot control the flow of traffic at an intersection. If an ordinary person attempts to control traffic, they will probably be ignored or perceived as irrational. This is not surprising. However, a policeman standing in an intersection would have no problem controlling the traffic. The policeman (actor A), in essence, can make a car (actor B) stop, go, and pull over as he wishes. Here, in Dahl's definition, the policeman has *power* over actor B.

As Dahl suggests, and I concur, there are indeed cases of simple relations between actors. With that said, it would be ignorant to exclude other forces involved in these power relations, i.e. non-agents. Nonetheless, Dahl's example is essential to the foundation of power, as it uncovers perhaps the most common origins for agentic power studies.

In another "traditional" outline of power, Stephen White notes the importance of specific actors, defined as "an account of the human subject or agent, usually developed in terms of concepts such as rationality, intentionality, responsibility, mutuality, interest, etc." (White 1986, p. 419). Yet, there are limits to White's illustration of the agent. Peter Digeser says this does not clarify its difference between autonomy, which is a valid criticism. In the context of power, agents have freedom; choice, knowledge, and intentionality are all critical pieces of the agent. Autonomy, on the other hand, already indicates power at least *exists*, if not already attained. What if an agent has no power? He surely still has intentions, but does intentionality equal autonomy? It is important to note the difference; agents do not always need to have power or be seeking power. Agents are merely a *player* of the *game* of power; but, there is more than one player, and more than one game; non-agentic power encompasses this complexity.

What if, however, actors in this web are not merely influenced by one another, but something external? Perhaps the relationship between actors is not a two-way street as Dahl describes, but rather a multi-dimensional intersection with countless lanes? Or, what if the web of the agents, *collectively*, formed a power on their own? Here, we see that agents can form non-agentic power. This describes the abstractness of non-agentic power, depicting how nonlinear forces can control actors in a complex world. It also reveals the formation of non-agentic powers, and how they manifest through *emergence* and *collectivity*.

Hannah Arendt's theories of power walk along the same lines as Dahl, though focusing more on the relationship between power and violence. Arendt notes that traditional carrots and sticks are important to power, but differentiates it from violence: "one of the most obvious distinctions between power and violence is that power always stands in need of numbers, whereas violence…can manage without them" (1970, p. 42). Arendt signifies a vital point: the quantity of agents in a system of power. Though Arendt's work *On Violence* emphasizes agentic power, she alludes to quantity, a key aspect of non-agent based power. In Chapters 3 and 4 we will address the number of agents engaged in power, and how it can alter the conditions of power that are present.

A. Nondecisions and Institutional Power

Many agent-driven theories of power revolve around an agent's *action*. Bachrach and Baratz introduce the importance of decisions and nondecisions in this context.

Bachrach and Baratz see a nondecision as "a decision that results in suppression or thwarting of a latent or manifest challenge to the values or interests of the decision maker" (1970, p. 44).

In applying Bachrach and Baratz's theory of *nondecisions* (1962), they use an example of pressure in an academic setting. They outline a scenario where a professor is preparing for an upcoming faculty meeting, and wants to change a policy that has been with the institution for a long time. Yet, the professor doesn't bring up the topic. There are two main explanations for the professor's neglect to bring up the policy-change in the meeting: First, the professor could be fearful of being viewed as disloyal to his employer and academic institution. This brings up a theory of institutional power. It is not only his colleagues who are influencing his decision to remain silent about the policy change, but also the institution he works for. The principles, history, and concern of job security are all contributing factors to the professor's nondecision. We will return to the idea of institutional power shortly.

Second, the professor could be thinking about his colleagues, (A actors) and his preconceived notion that the policy recommendation would be unfavorable. In both of these examples, the colleagues (A) are not performing an *action* or demanding the professor (B) to do anything. Yet, the professor is fully overpowered by A. These are still examples of agentic power, despite the absence of a specific, recognizable *action*. The professor is expressing his nondecision to act, which is a reaction to a result of agentic forces: the institution and his colleagues (Ibid).

Consider another example. President Obama's decision not to invade Syria in 2013 is a 'nondecision' with a large impact. Although the United States did not invade

Syria, he still made a conscious decision *not* to act. Yet, it is likely this decision was made with the issue of consequences in mind. Would there be repercussions be with Iran? Could this turn into a long-term conflict? What would this do for approval ratings? All these thoughts factor into a potential nondecision. In fact, these types of nondecisions unfold in all of our daily lives, where a conscious decision produces inaction; and, whether a decision is followed by an action or nonaction, a decision is made regardless.

As displayed, Bachratz and Baratz focus on the power of actor B in relation to actor A; this is unorthodox, as most theorists have focused mainly on actor A's "power over" B. So while actor B does not have power *over* actor A, they still can have an *impact* or *influence*. Here I will use the example of everyday consumers. One of the most useful data tools in marketing is Internet traffic. In short, companies want to see where their consumers are clicking on the Internet. So, when an apparel company (actor A) puts an advertisement out on a specific website, they see if their consumers (actor B) are clicking on the advertisement. Perhaps, they realize after several days, there is a better website that will attract more traffic to their company's product. So, they decide to modify their original decision, and move the advertisement to another location on the web. We see here that while the consumers (B) did not purposefully impact the decision of the company (A), they still changed the company's behavior. Therefore, we see Bachrach and Baratz have added a layer to Dahl's classical power by creating a nuanced affect to agentic relations between actors.

Choice is another essential element of Dahlian power. In an actor's assessment of the options he or she has, they are *choosing* a path. Bachrach and Baratz did separate themselves, to an extent, from Dahl; this separation is quite important to our discussion

on power. In agreement with Dahl, Bachrach and Baratz see power as a relationship between A and B, where A has power over B; yet in Bachrach and Baratz's definition, A's control over B is uniquely different than Dahlian realism. Bachrach and Baratz claim power exists when "A devotes his energies to creating or reinforcing social and political values and institutional practices that limit the scope of the political process to public consideration of only those issues which are comparatively innocuous to A" (Bachrach and Baratz 1962, p. 948). This is in the same realm of their nondecision theory, describing how B can influence the decision-making of A. Relations, while still the main focus of agentic power, are slightly altered in this definition by Bachrach and Baratz. A is no longer *directly* forcing B to perform a specific action, but rather setting up the *environment* or context in such a way so as to achieve actor A's desired outcome that power in fact exists over their actions. This could lead B to a nondecision, not to act, as a result of A's potential power over actor B's power(less) position.

Power is also applied to institutions, as displayed in the professor's nondecision. Imagine a pawn on a chessboard; its relationship between the queen, castles, and knights is agentic. Now, introduce the player. The player becomes the agent, and the target becomes his opponent. This is an agentic relation of power. The pieces now become part of the system, contributing to the game itself. Yet, let's say the player tries to move a pawn forward three squares, an illegal move. Play cannot continue as a result of the player's illegal move. Here, we see the "rules" of the game impact the relationship between the player and his opponent. This is one of many examples of agentic *institutional* power.[1]

[1] Bachrach and Baratz also refer to changing the rules of the game as the "mobilisation of bias" (1962, p.

It must be clear that *institutional* power[2] is a specific and stand-alone concept of power. Institutions are still seen as actors, and thus coincide with agentic power. Institutional power is incredibly important in terms of involving the non-agent, as the void between the agent and institution creates space for the non-agent; a force that can interrupt and influence agents and institutions. Reflecting back to Dahlian power, A controls B in a linear relationship. So, if institutions can embed themselves between A and B, this limits A's raw power over B.

While it can be argued that President Obama did not invade Syria because of the balance of powers and federal bureaucracy – in all reality, he could have. After all, he is the President. The professor, on the other hand, had much less power in relation to his institution. The professor was severely constrained by the consequences put in place by his academic institution, and therefore influenced his decision-making process. In reflection, Obama's example falls more into the category of a 'nondecision,' and the professor in 'institutional power.' Yet, both examples contain aspects of each classification. We see that a nondecision can overlap into several realms of power, but intuitional power is a much narrower concept, particularly in its application.

Though Arendt would frown upon the interchangeable usage of "power" and "force" in this paper, she fittingly addresses institutions and power, saying, "all political institutions are manifestations and materializations of power; they petrify and decay as soon as the living power of the people ceases to uphold them (1970, p.140). Agentic power, as Arendt discovers, is linked to institutional power. Institutional power cannot be found without first recognizing the agents, our groups of agents, which make up the

[2] Bachrach and Baratz allude to theories on "institutional power," but Barnett and Duvall coin the phrase.

institution. As the quantity of agents increases, the institution and larger system(s) begin to exhibit qualities of non-agentic power.

B. Dependency, Interconnectivity, Ability

David Baldwin is also critical of Dahl by adding his own contribution on *dependencies*, another important aspect of agentic power relations. Baldwin denounced Dahl for his ambiguity in the context of A's power over B. In every case of agentic power, A has control over B in a radically different capacity, potentially involving numerous parties and institutions. Baldwin addresses Dahl's indistinct concept in his own theory of *dependency*, which argues that actor A often becomes dependent on B's services and/or resources (1980). Dahl identified that power is indeed exerted from actor A, but overlooked that A is still receives something in return from B. Baldwin importantly distinguished that there is often a dependency factor, but it must be *clarified*. Baldwin writes, "the United States may be dependent on Saudi Arabia with respect to oil, but it is not dependent on Saudi Arabia with respect to Strategic Arms Limitations Talks" (Baldwin 1980, p. 497). Along the same lines, actors are often seen as *interdependent*. China and the United States are often seen as interdependent; yet they are not interdependent in the fishing industry or clean water. In my focus on non-agentic power, this correlation is exceptionally interesting; while the United States and China may be interdependent – in economic terms, my thesis aims to target the reasons behind this relationship. Why are they interdependent? Perhaps they are merely *interconnected*?

The world is truly *globalized*. Every place in the world is interconnected, in one way or another; the avenues for globalization, including trade, travel, information and

communication, are endless. We see that people in globalized systems are extremely connected, and in many ways benefit from such high levels of interconnectivity. Take air travel, for example. There are over half a million trans-Atlantic flights annually, using more than a combined 8 million gallons of fuel (Centeno 2012). A person booking a flight from New York to London may be affected by oil prices, as airline tickets and petroleum markets are interconnected, thus possibly impacting the dates of the New Yorker's London vacation. These types of interconnected markets can greatly influence human behavior.

Interconnectivity is not just limited to markets. Everything has connections, dependencies, and consequences; each node in a network is connected to another. Often times, the number of connections can make a system grow larger and more *powerful*. The more flights there are each day, the more oil consumed, tickets purchased, and humans traveled – not to mention increased use of public transportation, taxis, airline food, alcohol, and emails sent during waiting periods. There are certainly patterns of behavior and consumption in systems like air travel, but in many ways, it is unpredictable as well.

In contrast to agentic interdependencies, interconnectivity is an essential aspect of non-agentic power. Interconnected networks link agents within complex systems; the culmination of agents can create uncontrollable conditions of non-agentic power. So, while China and the United States are often cited as interdependent, they are more likely to be interconnected; in a globalized economy, it is probable each state could survive without one another. Of course, without an economic relationship, each country would be worse off, and certainly different trades would pose varying scenarios and outcomes. Nevertheless, each country would rather remain interconnected, as the cost of changing

the status quo would be too risky and unfavorable. As the global financial crisis displayed, global economic interconnectivity is highly consequential.

There is an important differentiation to be made between *interdependency* and *interconnectivity*. Non-agentic power contains more elements of interconnectivity, but it is still essential to uncover how agents become interdependent. Interdependency occurs when agents do not have options; there is a two-way street between A and B. No other agents are in the picture. With trade, interdependency suggests each agent could not survive without the other. Joseph Licklider, one of the founders of the computer, introduces two interdependent agents: a fig tree, and an insect. Licklider comments that insects pollinate fig trees, so therefore fig trees cannot reproduce without the aid and presence of the insect. In turn, the insect gets its food and energy from the fig tree. Thus, Licklider notes, "the tree and insect are thus heavily interdependent" (1960, p. 4). Although a computer scientist, Licklider correctly identifies the crux of political interdependency: survival.

Steven Lukes also rejects the foundation of Dahl's pluralist view of power due to its focus on agentic behavior. For Lukes, power cannot simply be confined between A and B's actions. Instead, there can be an external influence on A and B. Notably, the term *influence* advances in this concept; A can influence B's thinking, but B can still interpret and perceive. As such, we look at Foucault and his theory of knowledge and perception to see the two are inseparable (Foucault 1980). Foucault's ideas are closer to my theories on non-agentic power. Yet, before diving into Foucault, we will first continue with Lukes and agentic power.

In a relationship between A and B, B could do something that A actually wants B to do. Think of an intern on their first day at work; we have a boss (agent A), trying to get the most out of the intern's (B) work. From the other angle, the intern wants to make a good impression, and takes it upon his/herself to get coffee for the boss. The boss (A) does not force the intern (B) to get coffee, it just happens based on agentic interests. Therefore, the boss (A) doesn't have complete control over the intern's (B) actions, but is still benefiting; the boss gets free coffee and a loyal intern.

What this does not answer is why B is acting, (why the intern is getting coffee). Of course, we can make an educated guess based on the intern's interests and motives. The intentions are rather clear; the intern wants to make a good impression and secure a job. Lukes says power exists when actor B consciously does something to benefit A – then A has *real* power. So, while the boss can't control everything his intern does, power still holds weight. The shear fact that he has the ability to grant the intern a full-time job is huge; by knowing the intern's (B) intentions, the boss (A) can get the most out of his subordinate. Note Lukes presents a shift here, as power can now be expressed through ideas, interpretations, and intentions – not just actions. These ideas can also come in the form of consequences, or unintended consequences as well.

Finally, more contemporary scholars like Peter Morriss have also expanded Dahl's agentic theory. Morriss' argument centers on a division of power that diverges at a nexus of knowledge. Knowledge may, in some cases, equal power for agents; however, what if actor A does not have knowledge of his own consequences? Morriss reverts to Lukes in this theory, and focuses on actor A. Following this thought-process, Morriss critically defines power as the *ability* to perform a specific *action*. While this definition is

not new, Morriss divides power into two camps, epistemic and non-epistemic power; this division contextualizes the growth of an actor's decision, and the domino effect it may have. Epistempic power falls into the camp of agentic power, while non-epistemic is closer to my form of non-agentic power.

Epistemic power overlaps with Dahl and Waltz's (1986) pluralist theories. Morriss' epistemic power says actor A's command over B is contingent on A's knowledge that B *has the means* to perform that action. In political terms, this is incredibly applicable. Counterterrorism agencies are very concerned with *direct* and *imminent* threats; this is a consideration of epistemic power.

Let's say a terrorist organization is believed to be planning an attack on American soil, and there is significant, reliable intelligence that indicates this. As such, there is no debate on whether terrorists have the ability to carry out the attack; it would be nearly undeniable that, without American counterterrorism intervention, the attack would be inevitable. Here, we have laid out an example of classic epistemic power. There is straightforward intelligence that displays the power of the actor.

However, let's say a new set of intelligence data comes in, which suggests the terrorist group has either acquired, or is trying to acquire, a chemical weapons mass. This is an entirely different situation; while the threat must be taken seriously, the power of the terrorist group is much more fluid, and non-epistemic. Non-epistemic power focuses on the *potential* for an action to be completed, but does not require concrete knowledge that the action will occur. We don't know how, if, or when the attack will happen. I will be discussing Morriss' theory of non-epistemic power more in my exploration of non-agentic power.

II. Knowledge and Power

Foucault saw power and knowledge as an intertwined entity; there is no power without knowledge, and knowledge does not exist without power. This is not a cause and effect relationship, where knowledge equals power, but rather two separate maxims that are intimately connected. Power and knowledge are important concepts for all the theorists I have discussed. For Dahl, the policeman (A) and driver (B) were both knowledgeable of A's power. In turn, Lukes still saw power despite B's knowledge of A's authority. These are distinct differences that are important to consider. Even so, Foucault saw power imbedded in knowledge: "Power and knowledge directly imply one another…there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations" (Foucault, 1977, p. 27). In this explanation, the direct implication of power with knowledge provides an insight into Foucauldian power, which is completely totalizing. Totalizing, Foucault believed, because it is an all-encompassing power that brings together everything beneath it. This type of perspective is what I will be continuing in my non-agentic power analysis.

Contrary to the cliché, power is never in anyone's *hands*, which Foucault makes explicitly clear (Digeser 1992). Power, in non-agentic terms, cannot be held, controlled, or even expressed; without agentic ownership, power can only be *experienced* and *lived.* Yet, in non-agentic power, knowledge is ambiguous, posing the question, who has knowledge? Can agents in non-agentic power have knowledge? Does power itself contain

knowledge? These are the questions that make knowledge and power a different camp on its own, which we can explore in the tome of Foucault's literature.

In Digeser's analysis of Foulcauldian power, he addresses the idea of intentionality. For liberals, intentionality is an appendage of power, and without intentions, power is not real. This notion becomes increasingly blurred in Foucault's theory of power, which focuses not on the intentions of A or B, but rather the unintended consequences of their actions. Foucault writes that a study of power should not be concerned with "the level of conscious intention of decision;…it should not attempt to consider power from its internal point of view" (1980, p. 97).

I must agree with Foucault, who argues there is no all-encompassing 'theory' of power. Rather, power is a set of intricacies that man exists with, and who is entertained by the ideas it implores.

Foucault also theorized that in order for agentic relations to even exist, there are several foundational requirements that first must be present (Foucault 1982). First, there must be systems of differentiation. Agents cannot be in a relation of power, unless there are innate differences between them. Differences that Foucault discusses are related to prefixed contrasts, like economic values, social class, or cultural status. There can also be differences in objectives between agents. Objectives, plainly, are quite similar to competition; for someone like Hobbes, agents are naturally competitive and aggressive in the state of nature, only to be freed by the powerful Leviathan (Hobbes 1651). Similarly, Foucault marks *objectives* as an origin of agentic relations, but does not require an additional power, like a state, to subjugate the rights of agents.

Furthermore, Foucault uses examples of technology and military force as factors of competition. In order for agents to exist under the same system, there must be factors in which they communicate between, or interact within. Along the same lines, there must be a common institutionalization factor for the actors to amalgamate into, and finally, a consideration of degrees of rationalization. In this sense, Foucault questions the pragmatism of the agents' objectives, and the accessibility of external mechanisms to achieve those goals (Foucault 1982).

In this way, Foucault accepts a somewhat daunting division of power. If we simply accept that, considering these foundations of agentic relations, agents will indeed compete for power, it seems there will ensue an endless cyclicality. First, agents are introduced to power, then to other agent(s), and finally to their own desires. It is a simple formula that has created endless war and destruction. Yet Foucault brings in the sovereign to conceptualize the politicization of power. Sovereignty, "encompasses the totality of the social body" in the sense that a sovereign state embodies all citizens and their properties (Ibid, p. 104). Power, then, can be described as a relationship between the sovereign and the agent; the sovereign eliminates agentic relations, by ridding the quarrelsome formula recently mentioned. Yet, Foucault admits true sovereignty is more of a theory of the feudal monarchy, and only glimpses of real sovereignty have appeared since the seventeenth and eighteenth centuries (Ibid). What is left in today's political realm is what Foucault calls *discipline*, the profound antithesis of the sovereign, which has been established in the wake of capital and labor.

State power has transformed from a sovereign figure to a control mechanism. Discipline has molded agentic behavior that exists beneath this power. To better

understand Foucault's theory of discipline, we see features include societal *rules*, like posture and manners, and invasions of privacy like surveillance. The surveillance state has become the extensive reach of disciplinary power; it is, present day, inescapable, as WikiLeaks founder Julian Assange has described (Assange 2014). Society is no longer sovereign, as the surveillance state has disciplined the behavior of its own citizens. Citizens of the surveillance state are reactionary to it, and are therefore molded by its presence. Where "the theory of the sovereignty permits the foundation of an absolute power in the absolute expenditure of power" (1980, p. 106), the theory of discipline limits the power of its people, while augmenting the power of its reach. Foucault concludes, "these two limits, a right of sovereignty and a mechanism of discipline, which I define, I believe, the arena in which power is exercised. But these two limits are so heterogeneous that they cannot possibly be reduced to each other" (Ibid).

Foucault's theories of discipline and sovereignty are at the cross-section of agentic and non-agentic power. And, the sovereign also cannot limit non-agentic power, as it is limitless by definition. In many ways, non-agentic power contains elements of discipline. But both sovereignty and discipline influence agentic behavior within the system. We will move onto addressing the intricacies of non-agentic power, keeping Foucault's theories in mind.

III. Potential

As we descend into the world of non-agents, it is important to keep in mind we are no longer focusing on actors A and B, but rather the collective or system that A and B contributes toward. I earlier referenced Morriss' non-epistemic power in an example of

the terrorist organization. Morriss' non-epistemic power is much more interesting in our study compared to his epistemic analysis. Non-epistemic power focuses on an actor's *potential* to commit an action, rather than the actor's current ability; this theory decentralizes from the actor, and views power from a perspective of non-agency. I will give another example. While Apple has not created the next major technology after the iPhone and iPod, many people realize they have the *potential* to create and manufacture this technology. Therefore, Apple's competitors, consumers, and employees all factor this idea into their notion of Apple's overall power as a company. Although Apple hasn't even made this, let's say – "revolutionary" product, their potential to do so still factors into their power. Here, Morriss has introduced a non-agentic form of power: *potential*.[3]

Morriss adds another layer to his multifaceted theories, which he refers to as "latent." Notably, Bachrach and Baratz also use the term of latency to describe the *mobilization of bias* and *nondecisions*. As mentioned, Bachrach and Baratz's definition of nondecision was analogous to inaction; for Morriss, this type of inaction is a problem. Since Morriss' power is contingent on *calculated action*, or *potential for* action, a nondecision impedes the relationship.

Latent abilities, for Morriss, extend beyond Bachrach and Baratz's definition of latency and focuses more on *potential*. The ability to code is an example of a latent ability. Computer coding is not a natural ability like walking or running, but rather a learned skill. As such, latency is concerned with an ability that is not currently present, but possible to obtain. In non-epistemic terms, imagine a web developer working on a project for a tech startup. This web developer already has knowledge of computer coding,

[3] Note: I am not arguing that Apple has explicit "non-agentic" power because the company has the means and *ability* to create a certain product. Rather, I am identifying one contributing characteristic of non-agentic power – for a single agent – as latent ability.

but does not have web-marketing skills. In this example, the developer has some agentic power, but is limited by his/her lack of marketing knowledge. Still, the developer has *latent* power, as the tech startup could provide resources for him to *learn* marketing skills.

Scholars of late have also rejected Dahl's version of power for its finite analysis of agentic power. Notably, Parietti (2013) scrutinized Dahl, and his predecessor, Weber (1947), for their linguistic simplicities. Parietti recognizes that Dahl's theory is circular for its language that A "can" get B to do something. Yet, this often doesn't tell us what "can" is. Dahl's explanation tells us more about A's capabilities than the concept of power itself. This, in turn, poses the question of potential, which Morriss addresses, but Dahl does not explore. The circularity, then, is born within the concept of power itself, where "power represents, not a thing but, a condition under which things may be thought and done (Parietti 2015, p. 14). Applauding Parietti, this critique of Dahl perceives power close to Foucaldian discipline, but reaching further past agents. Parietti does not explicitly address the presence non-agentic power, but neither denies it.

IV. Soft Power

Soft power is closely linked to non-agentic power; both types of power are concerned with abstract influence. That is, are agents unconsciously influenced by 'greater' powers? In soft power however, agents do not contribute to power; this contrasts with non-agentic power, which acknowledges the contributions of agents in complex systems. Soft power is not, as Joseph Nye (2011) stresses, the culmination of everything

other-than hard power and its realist carrots and sticks. Dahlian power, in this context, is focused directly on hard power.

There are always undertones of soft power within hard power situations. Instead of using force, one can simply try to change another's preferences. In this sense, the target B is not *forced* to do something by A, but chooses on his/her own accord. Moreover, intentions are once again important. Nye notes that media and propaganda often vibrate aspects of soft power, but we see varying intentionality. For example, Voice of America is different than Hollywood in their intentions. Voice of America is intentionally trying to win the heart and minds of people in authoritarian countries in order to undermine the regime, but Hollywood's sole intention is profit. Even so, together, the ultimate results of 'soft power' may be the same.

It is essential here to mark the differences between the popular term of soft power, and its close cousin, non-agentic power. The United States uses soft power in aid situations frequently, and other countries have joined. For example, in 2010 the earthquake in Haiti was followed by a massive relief effort from countries like Brazil and China. Many argue the two countries only sent military troops as a façade – a merely ostensible aid mission. Soft power often, but not always, utilizes ideas and public conceptions in order to influence another actor – a state, government, person, etc. As the 2007 Beijing Olympics approached, Steven Spielberg sent a letter to President Hu Jintao, asking China to use its global influence during the Olympics to push Sudan to accept a UN peacekeeping force in Darfur. Soon after, China sent a representative to Darfur who successfully negotiated a deal; despite years of diplomatic attempts, it took an open letter from an American movie director to push on China's influence. Then, just months later,

Beijing's opening ceremonies of the 2007 Olympics flaunted soft power; billions around the world witnessed the beauty, drama, and sheer magnitude of the ceremony, all intertwined with a spark of Chinese history, culture, and (soft) power.

Soft power is not contradictory to realism, nor a form of liberalism, or an artifact of idealism (Nye 2011, p. 82). Instead, soft power is an encompassing technique of power security that exists in states, corporations, institutions, NGO's, terrorist networks and more. Notably, agents are not as central and focalized as they are in non-agentic power. Even so, there are some clear areas of overlap between the two concepts. Nye uses Lukes' three 'faces' of power in order to contextualize soft power; he also labels actor A as the "agent," and actor B as the "target." In a situation where soft power is exercised, the target matters just as much as the agent. In this conversation, target B can potentially control, coerce, or influence the decision of agent A (Lukes 2007).[4]

Now B has relative power. Lukes sees this potential as well, where B can impact A's interests. In reference to Lukes' (2007) writing, Nye notes, "Although not always easy, we can distinguish indoctrination from free choice in most instances" (Nye 2011, p. 87). So, while two agents are rational actors and think freely, their decisions are not independent of one another; in a connected society, one decision never stands alone. This causality creates space between actors to rationally act, but also influence each other. As such, 'free choice' becomes an absence filled by the influence of B on A. Barnett and Duvall, who specify this type of power as "productive," express this type of mental influence in more detail.

"Productive power" is Barnett and Duvall's most abstract and discursive theory of power. Productive power "concerns discourse, the social processes and the systems of

[4] We saw this slight role-reversal expressed earlier by Bachrach and Baratz.

knowledge through which meaning is produced, fixed, lived, experienced, and transformed" (Barnett and Duvall 2005, p. 55). Here, power is shifted into a construct of society. Terms like "civilized," "Western," and "failed state" are all examples of socially constructed effects of power relations. In one application, there are no concrete ways to measure a failed state; rather, a failed state is an expression of power that is produced and experienced by contemporary society.

In addition to "productive power" I want to touch on IR theorists Duvall and Barnett's "structural power," which is the "the constitution of subjects' capacities in direct structural relation to one another" (2005, p. 43). In essence, A is only related to B because of the system, institution, or political structure they interact within. For example, Duvall and Barnett use the terms Master-Slave and Capital-Labor as an illustration of systemic relations. Without the system of slavery, a master wouldn't have power over his slave. The mentalities of slaves believing they are inferior to their masters, and the masters more powerful, could be exaggerated by the system. In turn, without the social implications of capitalism, capital would be obsolete. Note here that power dynamics evolving from the "structural power" category are outcomes of non-agentic systems. Whilst (A and B) agents still exist, the driving force between their relative powers no longer comes from actors themselves – but the entities which agents *produce*.

Chapter 3: Elements of Non-Agentic Power

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In Chapter 2 we examined the history of agentic and non-agentic power, covering numerous theories of power that lay in each camp. While existing theories on power are crucial, there are still several questions that remain in terms of what constitutes non-agentic power. As such, Chapter 3 will continue to explore theories on power, but will offer new insight to the study of non-agentic power.

In this chapter, I will outline four specific elements of non-agentic power: *nonlinearity, intentionality, collectivity,* and *source*. In addition to describing the 4 elements of non-agentic power, I will compare and contrast each characteristic to agentic power, using examples to put each dimension in context.

I. Nonlinearity

The first element of non-agentic power is that it is *nonlinear*. First, let's remind ourselves of agentic power in the frame of linearity. In Dahlian power, we see agents A and B exist on a linear plane. Spatially, A and B are connected by their relationship of power, which can be expressed in a linear sequence: A→B, or B→A. This model extends beyond Dahl to other agentic theories of power as well. In institutional power, we see the

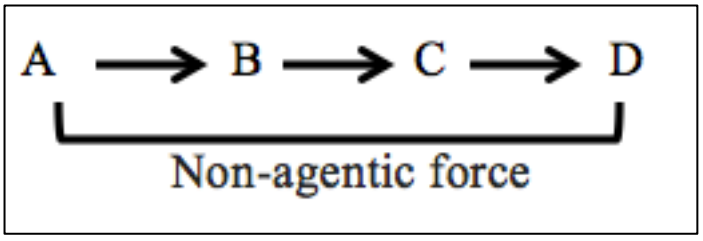
model looking something like this: A→INST→B. This relationship is agentic and linear, with the institution acting as an intermediary between actors A and B. The primary difference from Dahlian power is that the institution creates distance between A and B, possibly resulting in a greater time-gap between an action and its consequence. Looking at Bachrach and Baratz's theories of nondecisions and dependency, agents A and B still act in a sequence of linearity as well. In the infrequent yet possible situation that actor B benefits from A's inaction, Bachrach and Baratz call this situation a nondecision. We see the system has not radically changed as a result of B benefiting from A, or vice versa. If A's power becomes dependent on B's services, this once again does not interfere with the linearity of the relationship, or the function of the system.

In short, linearity does not change the larger picture of power. A→B and B→A effects a single relationship between two actors. Indeed, with the notion of unintended consequences, a simple, calculated action of power expressed by actor A on B can have implications for C and D. This ripple effect is certainly real and worth considering while evaluating the consequences, intended or not, of an actor's action. As such, we see that even these types of consequence-based scenarios are agentic, linear relationships: A→B[→C→D]. Even after the action of A is over, the consequences can be calculated on a basis of linear relationships. One consequence can have cascading effects on multiple actors. In doing so, the amount of power dispersed from A's specific action can be linearly measured. We can call this *backtracking*.

For example, let's say agent D is a young boy. One day, the boy comes home for dinner and there is no food. As an analysis, we find out that the boy's mother, agent C, was recently fired from her job and cannot afford food. This is because the woman's

boss, (agent B) was under pressure by the corporate headquarters (agent A) to let employees go due to the poor quarterly results. Although the headquarters and the boy (agents A and D) never interact, the boy is still affected by the actions of actors A, B, and C who precede him in the linear sequence.

In contrast to agentic power, non-agentic power is *nonlinear*. Agents within non-agentic power are tightly connected within the sequence of intertwined cascading events. Using the example we just looked at, there are two main problems that are connected. First, the company is failing, which is the reason the woman got fired. Second, the young boy has no food to eat. These two issues are undoubtedly connected, but they are not *linearly* connected. In the figure below, we see that the non-agentic force connects A and D, which represents the failing company and the boy with no dinner.



As visually depicted, the non-agentic force completely disrupts the linearity of the agentic sequence, but offers a link – an abstract explanation for the two problems. Although the linear sequence still exists, the non-agentic force provides insight as to why the company may be failing, and how it is connected to the boy. Note here that A, B, C, and D all exist within the same *system*, all acting as singular, connected nodes. We can also see it is difficult to identify the *source* of power, another separate element of non-agentic power that I outline in this chapter.

Let's say the company's stock had plummeted in recent weeks due to a variety of reasons. Stockholders have the power to make a personal decision whether to sell their

stock or not; in many ways, this is a non-agentic situation in itself. When individuals buy and sell shares in a company, there is an agentic relationship between the individual (A) and the company headquarters (B). Yet, when hundreds or thousands of people engage in the same activity of buying and selling, the shareholders as a group dictate how the stock shifts, and how the company reacts. This is the control of non-agentic power. This contributes to the concept of *emergence*, which we will return to.

Admittedly, there are also major components of each actor's *intentions* in this example. What are the intentions of the stockholders? What are the intentions of the headquarters that conceivably understands the possible impacts of firing employees? We will return to this idea as well in next section, which discusses the second element of non-agentic power, *intentionality*.

Interconnectivity between agents is nonlinear and complex in a non-agentic situation. While the failing company resulted in a high-ranking affiliate firing the young boy's mother, perhaps it was actually a media outlet that recommended selling stock in that company. Therefore, all share sellers who were influenced by the media are connected, non-linearly, to the young boy that has no food. Additionally, there can be something of a "herd mentality" that occurs. For instance, perhaps shareholders sold stock in the company because the market shifts in a certain direction; as agents see this change, there can be a rush to sell before others do, potentially creating a crash or crisis where all actors are worse off. We see this turning into somewhat of a prisoner's dilemma among shareholders.

So, there can be a variety of reasons that result in the same outcome for stockholders, the company headquarters, the affiliate/boss, the mother, and the boy. There

is no *linear* sequence between the actors that can be tracked; there are no rational explanations for how each agent acts. The *reasons* for outcomes derive from non-agentic power, which cannot be controlled, i.e. nobody can control the "herd" mentality. Agents can try and control the herd, like a farmer herding his sheep – but, in the end, the herd acts in unpredictable ways. And if one sheep wants to go east, but the rest want to go west, the herd will likely influence the lone-sheep to also go east, thus creating the herd mentality.

II. Intentionality

The second element of non-agentic power is *intentionality.* For non-agents, or actors existing in non-agentic complexes, there are absences of intentions. In order to explain this thoroughly, I first suggest that intentions exist in an agent-agent relationship. In an agentic relationship, agents are conscious of their actions, and their action's *potential* outcome. Actor A is conscious of his actions in the example A→B. There can still be unintended consequences of A's action, which he may be unaware of, but there is nonetheless a fundamental *intention* of the actor.

Let's return back to the example with the failing company and the boy with no food. As mentioned, there is an agentic relationship between stockholders and the company they invest in. When people invest in stock, their *intentions* are clear – to make a profit. Here, we see an example of a simple, agentic relationship between a buyer and a company. Intentionality is an essential example of agentic power, whereas there is no intentionality in non-agentic power.

Non-agentic *intentionality* embodies on the *collective*. When many people act in the same way, without analogous *intentions*, the linearity is broken; thus, there is a lack of *intentionality* for agents in non-agentic power. For example, Cindy did not have the *intention* to create Occupy Wall Street – she just contributed to it. I do not have the *intention* of creating a revolution in academia based on these theories of non-agentic power – although perhaps it is possible? I can only hope. In essence, agents do not always comprehend the full consequences of their actions within non-agentic power, and therefore lack intentionality.

Furthermore, stockholders do not have *intention* to undermine a company when selling their stocks. Stockholders are not purposefully forcing the mother out of work, and they are not purposefully making the boy hungry. Rather, stockholders are performing a simple, agentic action by selling shares. Perhaps, instead, they found a better investment elsewhere, oil plummeted, or the bond market became more attractive than stocks in general; as a result of these factors, and many other possibilities, the agentic relationship between the stockholder and company is broken. A single agent's decision to sell, let's say because oil plummeted, is not a radical shift; this does not affect the "big picture" like we discussed earlier. Yet, if oil prices plummet enough, the herd mentality could start to take effect. When this happens, and the *collective* group becomes larger and more cohesive, a formidable non-agentic power can start to form. When large trends in the market manifest, there are no longer *intentions* – the force cannot be controlled by an agent's intentions, nor does it have intentions on its own accord. I will continue this explanation of the *collective* – the third element of non-agentic power – in the next section of this chapter.

To recap, while agents themselves have *intentions*, like when investing, but non-agents do not. One of the main reasons behind the lack of intentionality is that there is *depth* to a non-agentic force. Intentions are key factors in non-agentic power; it is an element of its structure. On the other hand, we have yet to address the formation of non-agentic power, and how its structure builds. Why are there no intentions? Where does this begin? The answer starts with collectivity. As the number of agents involved increases, its interconnected nodes begin to form a larger power, separate from the agents themselves. With each additional agent, the network grows, adding to the collective unit, and growing alongside the breadth of non-agentic power.

III. Collectivity

The third element of non-agentic power is *collectivity.* The importance of the *collective* is essential in consideration of non-agentic power, as it combines the abilities and actions of *all* agents. The collection of a handful of agents is still considered agentic power; it is the multiplicity and growth of a network that produces elements of non-agentic power. To reiterate, there is no clear line where an agentic power turns non-agentic. Instead, there are elements of agentic and non-agentic power that we can analyze, perhaps ultimately deducing that a power has more non-agentic qualities based on a series of characteristics that I have, and will continue to outline.

The *collection* of agents in a single network commonly gives agentic powers non-agentic attributes. This occurs when the *collection* of agents builds a power of its own. We can once again use the Internet to show that it is easy for agents to communicate on

the Internet. This is nothing new or unexplained; when the *collective* is introduced however, this is when non-agentic power can be highly influential.

As Juris (2012) points out, technology-influenced social movements in the 1990's mainly used listserv accounts and mailing lists. Yet the introduction of social media completely changed the game. In fact, the biggest change from 1990's email lists compared to modern social media movements is the size of each actor's *network.*

The dyadic link between listservs and emails compared to social networks reveals the power of agents within each system. Emails are a mode of communication between agents; while one agent can send an email to a million people or to a large listserv, each actor acts as a "gatekeeper" where they have the power to decide whether to "forward" the email or not. In this sense, each actor that receives the email is empowered, while the power of the original sender is diminished.

In diffuse networks, like social media, there are no gatekeepers. Information flows at will. All actors suddenly become connected, through an open gate with no gatekeeper – the mutual friend, mutual connections, and shared interest groups. Without gatekeepers or agents to control the spread of information, the collective non-agentic power can grow quickly and unchallenged; this has been displayed first hand through the rise of open source information on the Internet. We will return to open source in Chapter 5 in our discussion of complex systems, like the Internet, using Wikipedia as an example.

Network is a common term used today, particularly in the realm of social media. Before the 21st century, a social 'network' might have been defined as a friend or social group. Work colleagues, childhood friends, admired authors, and trusted mentors – these are all different classifications of 'groups' or 'networks' one might have referred to. Yet

the term network has morphed into an entire different entity. Agentic relations no longer define networks; I no longer have to know the people in my 'network,' as the term has fewer boundaries today.

Network has also turned into a gerund: *networking.* In colleges and universities across the country, classes and tutorials are taught on the "best networking practices," and "how to" properly network. We now see people profiting from teaching others how to improve their *networking* skills, despite the fact that 'network' is such an expansive term. Today, the term *networking logic* describes the frame of mind that people use while actively networking. "Networking logics thus involve more than a disposition toward building horizontal connections across diversity and difference; they also help other political actors interpret such practices" (Juris 2012, p. 266). In essence, networking logic is radically different than agent-based networking. Online networks are so extensive they are *nonlinear* (the second element of non-agentic power).

As Juris mentions, networking has shifted from horizontal connection-making, and has advanced to a more fluid, disorganized, diffused system of interrelated people, ideas, and agents; indeed, agents are the central players of networks, and therefore we are not resisting the idea of agentic relations, or throwing agents out the window. Rather, we are exploring how networks grow into non-agentic power through collective agentic relations.

Networks are part of nearly everyone's lives, including mine. LinkedIn has become the largest hub for networking, as agents connect with each other to provide a platform of introductions and network connections. I have no doubt that LinkedIn has benefited many people in job searches and career advisement – that is why I have a

LinkedIn profile. But the *networking* aspect is a bit exaggerated. For example, the image below displays my own network on LinkedIn:

According to LinkedIn, my 241 connections gives me access to over 4.5 million people in my network. For sure I don't know 4.5 million people, let alone consider them part of my *network*. One could argue that I have 241 agentic relationships, giving me some type of neo-Dahlian agentic power; in turn, one could also say I am a small pawn in a much larger, non-agentic system with great power. If all of my 241 connections have a network with over a million people, we see a colossal network unfolding—an interconnected mammoth, despite there being a very low amount of concrete, agentic relationships. We see that networks are simply a pile of agents, layered on top of each other, somehow connected by an unknown thread.

Juris uses the term "logic of aggregation" to describe "the assembling of masses of individuals from diverse backgrounds within physical spaces" (2012, p. 260). The physical space that Juris references the 'network' – today, an overwhelming amount of Western society engages in social media networks. Furthermore, online social networks are completely detached and unbiased toward socioeconomic, political, religious, and ethnic backgrounds. These attributes of networks make it increasingly easy to join and leave networks effortlessly. It only takes one click to join a 'group' on Facebook or

LinkedIn. This is opposed to an agentic network, where it can be much harder to break socially constructed boundaries in the workplace or social cliques.

There is a sizable peril associated with the accessibility for actors to join networks so freely. As described in Chapter 2, Foucault believes the surveillance state is an extension of disciplinary power. This could be, perhaps, where power originates from – I will examine the notion in the next and final section of this chapter, where I discuss the "source" of power. Yet there is an applicable relationship between surveillance and networks; by making networks open and diffuse, we are opening society up to a new era of information control. This has already been displayed with controversies over NSA surveillance, net neutrality, and cyber security. By joining collective, open, and public networks, we give way to larger insecurities, otherwise unexposed to in more agentic or insular networks.

Additionally, there is a facet of inter-linkage within the concept of *collectivity*. How related, if at all, are different networks of non-agentic power? If the *collective* forms non-agentic power, can this have "unintended consequences" like we explored in an agentic situation? Markets are often referred to as "interlinked." The real estate market may be linked to the bond market or the gold market or the stock market; one cannot predict how each will act in response to one another, but there are certainly links between the ebbs and flows of each. Examples are all around; the natural gas and petroleum markets are completely different markets, but undoubtedly interconnected; as fracking increases, gas prices could potentially fall, which could also have effects on other energy markets like coal, solar energy, etc.

This level of interconnectivity could be detrimental. As non-agentic power grows, collects, and connects – societies become more vulnerable. The financial crisis in 2008 displayed the non-agentic power of the global economy; as the U.S. housing market failed and the economy went into recession, many Americans stopped consuming (at least at a steady rate). As a result, American companies slowed imports from China, thus impacting the Chinese market. The global economy is so interconnected – one failure could possibly bring the entire system down. The conventional actor, and his agentic relations, is left detached and exposed.

The *aggregation* aspect that Juris notes is an important piece as well. In order to build this massive, non-agentic network that I have described, aggregation is essential. For example, if this was 2003 and I was part of the first wave of LinkedIn users, it's likely my 'network' would be much smaller. In short, in order to have such a large network, and in order for the network to have non-agentic power, people must join. No social movement gains any power without public endorsement and cooperation.

Let's consider the use of social media during the Occupy movement in 2011. The case of the Occupy Wall Street and Occupy Everywhere is an interesting case, as the social movement purposefully had no leaders, making it a compelling example of non-agentic power. This analysis of the Occupy movement is not to address its successes and failures. Instead, the Occupy movement exhibited numerous elements of non-agentic power that are worth discussing.

As with the Arab Spring, the Occupy movement launched with assistance and rise of Twitter and Facebook. In the introduction we mentioned that a woman named Cindy was one of the first people to tweet about the Occupy movement. In fact, the Occupy

movement wouldn't have existed without millions of people like Cindy participating online and joining the 'social network' of Occupy. For the first time, an agent could *participate* in a social movement from his couch or desk at work. Ironically, one of the 'founders' of the Occupy movement, Micah White, coined and critiqued "clicktivism," the new age of technologically-based activism online; clicktivism measures successful protest campaigns solely on the number of 'clicks' or electronic signatures it receives (White 2010). There is irony here, since Occupy likely wouldn't have been the same without so many agents 'clicking' in.

Non-agentic networks rely on *collectivity* and *aggregation*; without these elements, a network is just another sum of agentic connections, not a growing non-agentic powerhouse. Since there was an absence of purpose, goals and direction in Occupy, we can view this as a unique case for non-agentic power. Letting the *collectivity* of people and *aggregation* of ideas dictate the direction of a movement is seldom seen. Although to an outsider it may seem chaotic and disorganized, non-agentic power like the Occupy movement is tactically immeasurable; there are no transparent 'prices,' 'clicks,' or benchmarks, making growth difficult to track.

In fact, many social movements in the past have used this same framework. While Martin Luther King Jr. was certainly the leader of the civil rights movement in the U.S., many scholars believe that segregation would have ended even without MLK. Though segregation would not have ended at the *time* it did without MLK – he's arguably the most influential activist in American history; the *collection* of the movement was undeniably there. Lastly, the civil rights movement is also an example of how the electricity of one agent, like MLK, can incite millions of others within his/her network.

When the electricity travels so quickly and powerfully, the non-agentic force of a movement can be difficult to stop.

IV. Source of Power

Where does power come from? The question begins the paramount debate of this thesis, as it begs the issue of agentic and non-agentic power. While both are practical forms of power, each have significant disparities. One of the main distinctions between agentic and non-agentic power is the source of power. In essence, what and how is power's dawn in its upmost organic form?

Source of power is the fourth and final element of non-agentic power. In any analysis of power, perhaps the most important element to identify is where the seed of power is, and where it stems from. There is a considerable contrast between the source of power in an agentic relationship, and the source of power for non-agents. In an agentic relationship, the agents themselves *create* and *hold* power. With that said, there are countless theories on the origins of power. Arendt recalls that Voltaire declared that power exists on a basis of agentic relations, saying, "consists in making others act as I choose" (Cited in Arendt 1970, p. 36). In turn, Mao famously said, "political power grows out of the barrel of a gun" (Zedong 1938). Even Nye's realist theory of hard power would agree with Mao's sentiment that military aggression and incentives could grant an actor's demands. In contrast, Dahl focuses more on agents than carrots and sticks, revealing actor A creates power by influencing B to do something he otherwise wouldn't have done. In Barnett and Duvall's "structural" theory, power originates within the

system of actors. Power, then, for a master and his slave, is conceived at the mere existence of slavery.

Societal norms cannot be backtracked, meaning one cannot clearly prove or explain the reasons humans act the way they do. The only way to predict human behavior is by looking at the *type* of power that is present – agentic, non-agentic, or some combination of both. Foucault's theory of discipline suggests otherwise, proposing that subtle behaviors dictate how people act. Minor behaviors, for Foucault, stem from his theory of discipline, thus theorizing that societal norms themselves hold power. As noted, this theory comes at the intersection of agentic and non-agentic power.

Finally, in a non-agentic situation, the source of power is *emergence.* This is the argument and focus of the fourth dimension of non-agentic power. Emergence is the culmination of many entities that create a larger system, event, movement, etc. There are two phases that create a non-agentic power: First, there is an emergence stage where many different actors contribute to a larger power. Second, the power in which the emergence takes place grows, uncontrollably, and the non-agent develops its own power.

This is a similar concept to what we discussed with the Occupy movement. Many people took to social media to 'join the movement,' despite not knowing the direction it was heading in. In context, this is the emergence stage, where the masses collaborated in the same action to create a greater, more irrepressible power. Control is also a significant factor in emergence, since non-agentic power is uncontrolled, (by any single agent, at least) and paradoxically disciplined by its own extensive reach. Therefore, we see that without leaders of the Occupy movement, it created a mind of its own.

Emergence gets to the heart of non-agentic power. If everything were predictable, power wouldn't exist. Every agent would know when and where to act, leaving nothing up to chance. However, systems that agents contribute toward are more powerful than any conscious actor. This power dictates how all agents act, no matter the size. Beneath non-agentic power there are no ways to redress grievances for agents – nobody controls the power, and there is nobody to turn to when something goes wrong.

* * * * *

In the next chapter we will be discussing complexity and risk. The word 'risk' inherently implies negativity, a decline towards collapse or failure. However, it is essential to consider the positive aspects of risk. Investments can be seen as 'risky,' meaning there is a greater probability that returns on investment will be negative than positive. Risk does not guarantee depletion, however. Sometimes the most lucrative investments are risky from the start. On a simpler level, think of a speeding car. The faster the car goes, the quicker the driver gets to his/her destination. In doing so, the risk of getting pulled over or crashing goes up, but so does expediency. So while it may be risky to drive above the speed limit, it is also more efficient.

This chasm between risk and efficiency is noteworthy to consider in next chapter. The trove of systemic risk literature explored by Centeno, Urry and others take a subtly negative stance on risk. In many ways, this thesis has agreed along the same lines, viewing global interconnectivity of agentic relations as a daunting prospect. This negativity of systemic risk is not universal across all cases; instead, there is a gradient to measure risk. A system or power may be on a *path* of risk, but still operate productively. The speeding car could be, if it doesn't slow down, heading toward a speeding ticket.

Though, it is impossible to predict when, and if, that ticket will come. Maybe there are minimal police officers on the road that day, or maybe there is another crash that diverts police elsewhere. Even if the car is driving on a path of 'risk,' it doesn't contingently guarantee failure.

Complex systems of power abide by the same circumstances. Often times, as a system's complexity increases, its efficiency and risk factors increase conjointly. We can use the example of the Internet and technology. Twenty years ago, dictionaries and encyclopedias were slower than Google is today. As such, we have seen agentic connections skyrocket, along with efficiency to globally communicate via email, Skype, texting, etc. Despite these advancements, we cannot ignore the potential risk that each new agentic connection poses. We cannot predict when the system will tip, causing a systemic failure. Therefore, we examine the attributes of these complex systems, assessing their power, in order to find a dual perspective to look at such powers, both by admiring efficiency but respecting its potential risk.

Chapter 4: Distant Cousins: Complexity, Power and Risk

* * *

So far, we have identified the defining factors of agentic and non-agentic power. We have not yet looked at the benefits of such power, but more importantly, the potential hazards. This leads us to the field of systemic risk. Studying systemic risk within a scope of power is imperative. In order to do so, we must first define several terms that describe systemic risk, which will lead to the discussion of how it differs from non-agentic power. As I will argue, a collective system with the four elements of non-agentic power *could* be dangerous, as its interconnectivity could pose a prospect for systemic failure – this systemic power has been displayed in the financial crisis. And, when a system fails, the largest concern is who, or what, fills the void of power left behind in the vacuum.

It must be noted that there are some potential benefits to highly interconnected systems, namely efficiency. While the speeding can get to destinations faster, it also involves greater risk. We have seen this displayed through widespread and rapid globalization in the past century. Although interconnectivity is beneficial, we do not know when, or if, these systemic connections will ultimately fail. Just like children playing on a seesaw, there is a distinct tipping point that pushes one side to the ground. This is an essential element we will explore in this chapter.

Framework

In this chapter we will focus on four main terms that deal with global power: complexity, complex systems, non-agentic power, and systemic risk. Of course, my main contribution within these closely related terms is non-agentic power. My aim in this chapter is to differentiate, and in doing so, create a framework in which non-agentic power can be specifically identified within a complex situation. Figure 1 below creates a visual representation of these four terms. Note that complexity is the largest and most broad term, while systemic risk is the narrowest classification of a complex power.

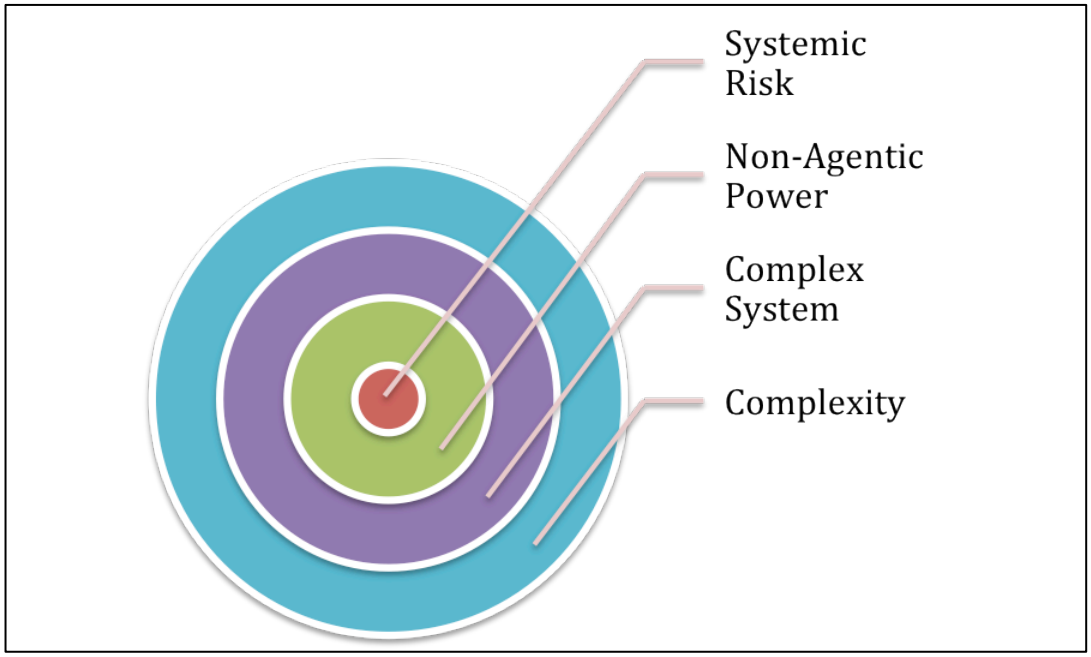


Figure 1

This chapter will proceed to filter out the differences between these words, starting with complexity. At the end of the chapter we will discuss how non-agentic power has its own designation, and why it is important to classify it individually.

I. Complexity

Complexity is a vague term. Many things are *complex*, but that doesn't offer any analysis to why or how it is complex. The American legal system is arguably *complex*, but so is a recipe for chocolate cake. With that said, neither of those statements actually tell us anything about the American legal system, or teach us about how to bake the cake. In order to identify how complexity fits into our investigation of power, we must first answer the question, where does complexity *occur*?

Complexity thrives in fluidity; where there is complexity, there is space for change and evolution. Two of the main elements of fluidity are *time* and *space*. In highly complex situations, time and space are no longer fixed or limited. Rather, *things flow* – information, people, and ideas – each on their own, with no affixation to time or locale. Urry calls this type of complexity "timeless time," (2003, pp. 18-22), where there is no set amount of time it takes to complete a task. Rather, events simply happen. We will see this concept is closely related to non-agentic power. For example, in a factory, (an agentic power) the factory workers (agents) are on strict *timelines*—there are deadlines to produce, manufacture, export, etc. Time is everything in an agentic situation.

On the other side of the spectrum, time and space are deconstructed in situations where there are circumstances of non-agentic power. "There is a clock time of the mass production of factory, the timeless time of the computer and the glacial time of the environment" (Urry 2003, p. 11; see also Castells 1996). In this type of postmodern 'timeless time' and vacantly-occupied space, there is a rapidly growing complexity. The flow of information doesn't abide by time; it also doesn't abide by location. The Internet has no space – it has no factory, no workers punching the clock for work. Agents simply

act on their own time – responding to emails as they wish, and disengaging from networks as they please. It is growing so rapidly in fact, that agents can connect to the Internet nearly anywhere in the world, whether it is from a cell phone or computer. Structurally, we see a picture that is constantly changing and difficult to track.

Complexity is not just about time and space, however; complexity is also an adjective to describe a type of system or network. Yet, before moving onto generally describing a 'complex system,' it is crucial to describe the specific complexities that exist *within* or *beneath* systems. In this description, we are not focusing on a system from a macro level, but rather seeing the nuts and bolts that make up the (un)functioning machine.

Reductionist scholars perceive complexity by the parts that make up the system. However, complexity "investigates emergent properties, certain regularities of behaviour that somehow transcend the ingredients that make them up. Complexity argues against reductionism, against reducing the whole to the parts" (Urry 2003, p. 13). Complexity refutes reductionism because many complexities simply cannot be reduced. The financial crisis, for example, is a complexity that cannot be clearly minimized. We cannot precisely identify an agent that 'started' the crisis. Therefore the power is unbounded in time, as there is no beginning – and although the crisis is 'over' – there is no consensus of when it ended. Additionally, is not always linearity between cause and effect (think back to the linearity image in Chapter 3 showing actors A, B, C, and D. There was no linear connection between the boy with no food and the company headquarters. Only non-agentic power created a faint correlation). Complexities, perhaps most importantly, contribute to irreversible consequences in elaborate systems.

Helbing (2010) breaks down complexity into three camps: Structural complexity, Dynamic complexity, and Algorithmic Complexity.[5] Structural complexity is the most traditional form of complexity; cars and iPhones are structurally complex because they are made up of many different pieces. With that said, we still know how a car will respond, or at least how to use it. The same goes for an iPhone. Structural complexity is most useful for reductionists who argue that everything can be broken down into pieces, which together, are classified as *complex*.

Dynamic Complexity returns to Robert Dahl's example of roadway traffic. If you recall, Dahl notes that an actor driving in his car has *relative* power. Relative, in the sense that a layperson in everyday clothes cannot control traffic in the same way a policeman can in his uniform. Therefore, although both instances are examples of agentic power, the policeman still holds more *influential power* than the layman. As such, we see a hierarchical structure within the concept of agentic power forming.

Though Dahl's example is classic and principal in power studies, it is also limited. Dahl only focuses on agentic relations, but every agent driving in his car is actually acting within non-agentic power – the traffic itself. This leads us into complex systems, the next dominion in our study of complexities and power.

II. Complex System

The actions of self-guided agents on a freeway are highly interconnected. In fact, traffic patterns are a prime example of Helbing's Dynamic Complexity, as well as non-agentic power. Roadway patterns are so connected that small-scale events can have large-

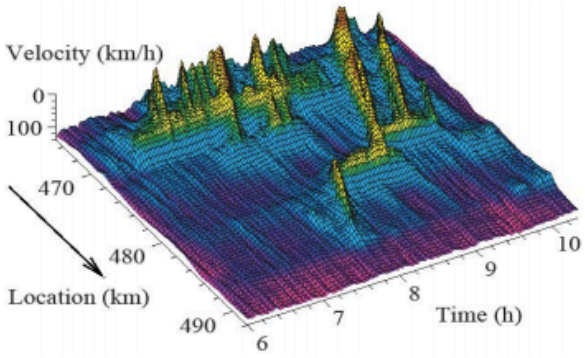
[5] We will not be discussing Algorithmic Complexity since it is based on computational programming and it is not relevant to our discussion on power.

scale implications. Leading emergent risk scholar Miguel Centeno has indicated that non-agentic systems are nonlinear and disproportional in size; he uses the example of a flat tire in heavy Detroit traffic that could lead to the cancelation of numerous flights in Tokyo.[6] Chaos theorists agree that seismic events can occur at random, causing large or small results.[7] Consequently, we are all reacting to a sequence of consequences caused by an actor's movement or action within a complex world. At the most fundamental level, we can say there is no causal relationship between two actors, or two events. One cannot always prove that B did something as a result of A's action; on the contrary, there could be non-agentic forces in play. This is my definition of *nonlinearity* outlined in Chapter 3. The boy with no food was connected to his mother's company's headquarters in a nonlinear bond. The cause and effect line could not be conspicuously drawn, but it was there, derived from a non-agentic power.

Traffic, as Centeno describes, is unpredictable, since we cannot predict how other actors will drive. Time, velocity, and location are all unpredictable factors of the complex roadway system. Helbing uses Figure 2 image below to depict the traffic example, where the yellow peaks represent traffic jams and congestions – completely unpredictable aspects for the drivers as agents within the complex system:

[6] Centeno does not connect the dots between the heavy traffic in Detroit and the cancelled flights in Tokyo. Although the actual scenario is far-fetched, Centeno is addressing the unpredictability of events in time. Perhaps the Detroit traffic delays a pilot who then cannot fly from out of the Detroit Metro Airport, which then delays the connecting plane to Tokyo. There is a nonlinearity causality, which in a complex system like air travel can prompt challenges and issues for passengers.

[7] The quintessential example is the "butterfly effect," depicting that a tiny change—like a butterfly flapping its wings—can cause monumental change.



Freeway traffic can be a dynamically complex system, involving many independently-thinking drivers in a larger system. The self-organized patterns of traffic can lead to traffic jams and congestion, which is hard to predict for each singular actor involved.

Figure 2

Prior to a system becoming "at risk," there first must be a system. This illustrates the intricate subtleties that lay between such terms. As I will argue, all systemic risks, or "emergent risks" as they are sometimes called, occur under conditions of non-agentic power. This means that all systemic risks abide by the four elements of non-agentic power that I outlined in Chapter 3: *nonlinearity, intentionality, collectivity,* and *source.* Notably, not all systems are at risk, and not all instances of non-agentic power are systemic risks. Figure 1 shows the overlap between the four closely related camps.

While all at-risk systems exercise non-agentic power, not all complex systems are non-agentic. Here, we see there are definitive "tipping points" with complexities. When does a normal complexity turn into a complex system? When do complex systems become non-agentic? When does a complex system become at-risk? The answer is found in emergence.

I propose that tipping points occur through the *quantity* of emergent units. Emergence grows by the contribution of the collective, where individual agents act in unison to form a larger cluster. Notably, emergence can come in various forms – ideas,

actions, and transactions can all be small emergent factors that flip the switch, causing a complex system to change its shape, direction, or size. It could, potentially, push the system to the brink of collapse. In any scenario, an emergent risk is unceasingly a type of non-agentic power, no matter what type of emergent factor it may be. I will continue to outline the nuances of the differentiations in the later sections of the chapter; the key point is that emergence is the evolutionary character between these related terms.

Before delving into the intricacies of systemic risk and looking at examples, we must first identify what a complex system is at a basic level, and see how it may vary from instances of non-agentic power that is an emergent risk. There are several key attributes of complex systems we can look at in order to determine how at-risk it may be. Mitchell (2009) offers three defining factors of complex systems: collective behavior, signaling and information processing, and adaptation.

First and foremost, complex systems are formed by the behavior of the collective. This is Mitchell's first aspect of complex systems, and my third element of non-agentic power: *collectivity.* Mitchell extends his analysis to include the absence of leaders or a clear direction, which I also alluded to in the presentation of the Occupy movement. With these correlations, we see that non-agentic power is an offspring of a complex system.

Mitchell's second common property of a complex system is information processing, which is influenced both by internal and external environments. Essentially, a complex system is highly reactive to the behavior of its agents, like the herd mentality. Information that passes quickly within a complex system could easily change the shape of the system. With that said, complex systems are also responsive to external, environmental factors as well. This is another aspect of information processing.

In an ant colony, a highly complex system, ant movements usually depend on environmental factors like weather and terrain. Still, each ant can act on its own, demonstrating that Mitchell's theory on internal information processing is applicable. Additionally, while the environment affects complex systems, agents within the system also affect the environment in turn. For example, in the case of global warming, humans consume more energy products, (air conditioners, fans, etc.) as warming increases. This positive feedback only continues to harm the environment.

The final property Mitchell presents is that all complex systems adapt. That is, complex systems exist to survive—like any mammal—and will change its behavior at all costs in order to stay alive. In this hypothesis of adaptation, Mitchell suggests complex systems are conscious of survival, and therefore have *intentionality.* This theory would contradict my definition of non-agentic power, which denies intentionality; yet, Mitchell is outlining a complex system, not a non-agentic power. Here, we see a strict dividing line between a complex system and non-agentic power, but illustrating just how close they can be from a structural standpoint [see Fig 1]. Finally, it is worth mentioning that some scholars indicate a split between *adaptive complex systems,* and *nonadaptive complex systems*; my definition of non-agentic power would fall into the latter category. Mitchell does not accept this differentiation.

III. Systemic Risk[8]

[8] We will skip the analysis of non-agentic power here, as we have previously described and non-agentic power. Note that in a linear explanation of power and complexity, (as shown in Figure 1) non-agentic powers would be outlined here.

We have clearly stated the attributes of non-agentic power. The next step in this theoretical analysis is to assess the fate of such growing and uncontrollable powers. In a related literature on *systemic risk*, this discussion has been outlined in great detail. In general, systemic risk research has focused on the quandary of whether the post-globalization era has evolved to such high complexity – a complexity where markets, networks, and information systems are so interconnected – the entire complex is at risk. Studies on systemic risk (Rochet and Tirole 1996; Haldane and May 2011; Billio 2012) have mainly focused on financial systems, inter-agent transactions, and bank lending. The financial crisis in 2008 has been viewed as a systemic failure, where one part of the system brought the global economy to its knees.

There have been many examples of systemic risk in the past. Enron, Black Monday in 1987, and finally the global financial crisis in 2008, which "triggered an estimated loss of 4-20 trillion US$" (Helbing 2010, p. 2), though the number is likely greater today. In the example of climate change, a very pressing systemic risk, "The related reduction of the world gross domestic product is expected to amount to 0.6 trillion US$ per year or more" (Ibid). The question remains, are systemic failures inevitable and unstoppable? With the mere existence of non-agentic power, will there be an inherent risk of collapse?

Examples of current risks are all around us. The rise of the Internet was faster than any other technology; there are over 1 billion Internet users in the world; Facebook founder Mark Zuckerberg has even expressed his desire to have every human join Facebook – possibly creating the largest and most interconnected non-agentic power. As a result of these interconnected systems, the distance between actors is diminishing.

There are more international travelers than ever before; the time it takes to communicate with someone next door is no different than someone halfway around the world. Time and space could be 'de-materializing' (Urry 2003).

One could argue that the distance between actors is decreasing as a result of globalization. Globalization, although certainly complex, does not exhibit characteristics of a non-agentic power, but an emergent factor:

> Globalization is not the property of the individual actors or territorial units. It is an emergent feature of the capitalist economy as a whole, developing from the interconnections between different agents, especially through new forms of time-space 'distanciation' across the globe and compression of the time-space relations. (Urry 2003, p. 4)

The degree of agentic interconnectivity from globalization is dense. Globalization not only connects agents to each other, but it connects them on multiple levels. Each node is not just connected by one line, but many. Agents are not just linked by trade, but also through technology, communication, and open source. Complexity, as previously discussed, marks the beginning toward systemic risk. As the system becomes more complex, other emergent factors join in – more people, more Internet users, and more networks. As the world expands, more emergent units contribute to the complex system, and the closer we are pushed to *global systemic risk.*

The question remains, how does a system become at-risk? The answer is emergence. Emergence is perhaps the most important aspect of non-agentic power and complex systems alike. This is why "systemic risk" has been routinely called "emergent risk," and why the third property of non-agentic power I identified is *collectivity*, a contributing aspect of emergence. Emergence, compared to systemic risk, is not a new term. Many sociologists have used emergence to describe contributing factors to social

systems and their size, power, breadth, and personalities (see Goldstein 1999; Holland 1999). Keith Sawyer's *Mechanisms of Emergence* (2005) also provides a detailed history of emergence within sociology studies, and is quite applicable to this investigation of systemic risk.

IV. Emergence

Primarily, emergence serves the purpose of reduction; in order to analyze complex systems, we must see what parts it is made of. Emergent properties are irreducible. This is perhaps the most defining quality of an emergent unit. In a complex system, like the physiology of a human body, arguably the smallest emergent units are atoms and molecules. For scientists, emergence is a useful perspective and tool. I have already refuted reductionist theory; it is essential to understand that not all complexities may are reducible to each atom or molecule. We may be able to recognize larger parts of the whole – appendages, if you will.

Urry uses an example of a pile of sand. From a reductionist perspective, the emergent units of the pile are the grains of sand. As I mentioned, the division between risk and a regular complex system is based on the quantity of emergent units. So, the addition of a single grain of sand on top of the pile could cause a large avalanche, or have no effect at all. The first describes the pile of sand as a "complex system"; the latter describes the sand as a "systemic risk." In either case, the addition of emergent units always pushes the system toward the 'risk' tipping point.

There are two main concepts to analyze while looking at a systemic risk: prediction and control. We will first look at the concept of prediction. With the presence

of a non-agentic power, we do not know when its qualities will change. Meaning, we cannot predict which grain of sand will make the pile of sand fall. All we know is that if we add more grains of sand on the pile, we add risk, pushing it closer to failure. People can guess which emergent unit will lead to the tipping point – which sand grain will cause the collapse – but there is no evidence to determine these triggers.

The control aspect of systemic risk is closer related to consequences. In a complex system like traffic, as we discussed, all agents lose control due to the "irreducible randomness" (Helbing 2010, p. 9) of the traffic. Of course, if agents could control traffic patterns, there would be no delays, nobody would be late for work, and efficiency would be maximized. Yet, agents cannot control the behavior of others. We see then, there is no way to control the outcomes of complexity and risk, and therefore risk is free to expand, untamed. We will now head deeper into the notion of emergence.

Emergence does not only mean the sum is greater than its parts. Rather, "there are other system effects that are somehow different than its parts" (Urry 2003, p. 24). We see that the effects of the system, which contribute to how agents act, are in fact different than the parts themselves. Thus, emergent factors are *not simply* the grains of sand in the pile, but also the force, time, and space, which made the grains arrive in the first place. Since time and space are such key factors in complexity, we now see them appear again in our analysis of emergence. Here we have reached a layered understanding of emergence, which again rejects the reductionist method of viewing complex systems.

In many complex systems, we cannot identify the sand grains – we cannot recognize the absolute individual actors that caused the financial crisis. Instead, we can identify what Sawyer calls are *collective emergent properties*, which are emergent units

that are shared by collective group(s) in the system. In short, if there is a large, complex system within non-agentic power, we break down emergent properties by group or network. Figure 3, (Helbing 2010) below represents this level of analysis:

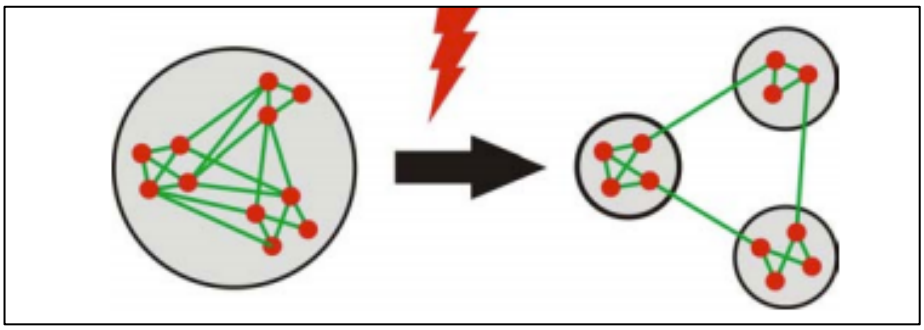


Figure 3

Due to the complexity and size of non-agentic power and complex systems, there are no social mechanisms to pinpoint why a non-agent is acting in a particular manner.[9] As a result, we find collective emergent units within the system.

In short, non-agentic power cannot be completely 'reduced' to the agentic level, meaning we cannot discern every agent in the system. Even after considerable analysis of the financial collapse, it is impossible to pinpoint a specific agent (person, bank, institution, agentic transaction, or an agent's loan, etc.) that caused the downfall. On the other hand, there have been careful analyses that have identified a series of themes that could have contributed to the financial crisis: deregulation, lack of transparency, short selling, subprime lending, interdependencies of major banks, and high frequency trading are just a few of many possible malpractices (Sawyer 2001). While each category contributing to the crisis is not narrowed down to specific agent(s), they are indeed much

[9]In sociology, a Social Mechanism (SM) aims to explain *why* people act the way they do. If a person goes out to dinner, it isn't enough to say they did so simply because they are hungry. Rather, there are SM's that explain why they chose to eat where, and what they ate. SM's are important to the study of non-agentic power because in large systems, SM's do not exist. Instead, we look at collective emergent properties that combine to create complex systems.

smaller, more manageable, and less complex systems to look at. Rather than individualist or agentic, we can now view systems based on collective networks of *collective emergent properties*.

This type of social emergence perspective is thus based on the notion that social properties cannot be reduced to individual property. Sawyer popularizes the phrase "nonreductive individualism" to explain the process of reduction within complex systems. To contextualize this theory, we see this ideology sharply contradicts John Locke's classical theory of property outlined in his timeless *Second Treatise of Government* (1980, Chapter 5), where Locke defines property as anything gained from labor requiring effort. Locke uses the simple example of picking an apple from a tree, where the apple becomes the property of man. Locke's theory is *not* helpful in an analysis of systemic complexes, as the specific agent picking the apple is untraceable. As a result, we group agents or other emergent factors together. Instead of looking at one agent picking an apple, we can look at the whole apple orchard. When these social properties globalize and connect, we see emergence from a perspective of multi-agented properties. Meaning, we can see layered and polymerized[10] emergence, forming much stronger and larger bonds. These complexities create systems that are difficult to collapse.

Complex systems are all around us, and many of them are at-risk, we just hardly can see it. Electricity grids are one example of systemic risk. Each electrical power plant, or electrical pole, is like a small node in a giant network. Power lines connect each node, forming interconnected webs that, over time, fuse with other webs. Figure 4 (Helbing

[10] Polymerization is a chemical process where molecules combine to form three-dimensional chains of polymers.

2010) below represents the risk of such interconnected systems, particularly when actors within the system are unconscious of its power.

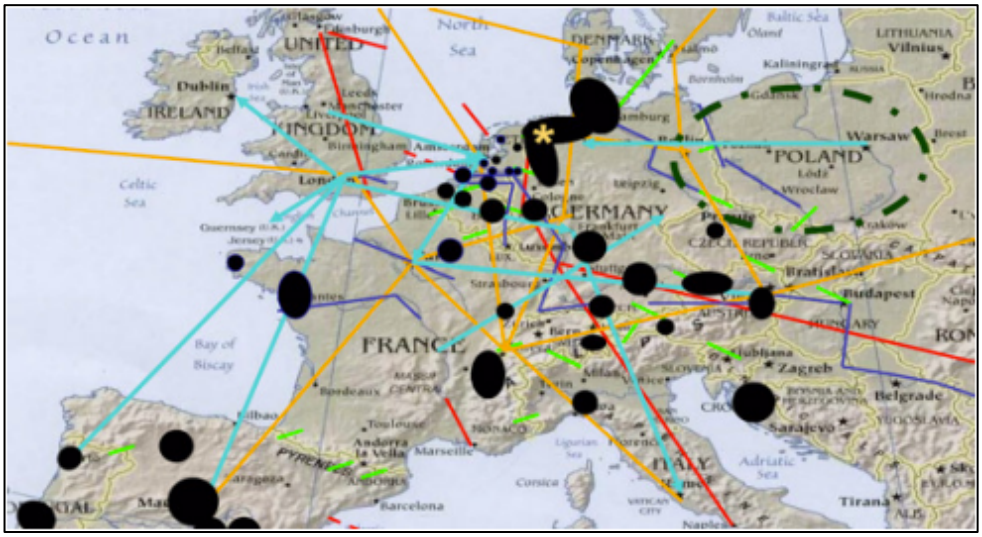


Figure 4

Figure 4: An example of a blackout of the electrical power grid in Europe. To allow for the transfer of a ship, one power line had to be temporarily disconnected in Northern Germany (the gold star). This triggered an overload-related cascading effect, which resulted in a major power outage over Europe (see black areas). The image illustrates how a small action can cause a multitude of consequential results in a *seemingly* unrelated network.

It is unknown at exactly what point in *time* the European electrical power grid became a systemic risk – just like it is unknown exactly *when* the global economy became vulnerable to a systemic financial crisis. Perhaps the electrical grid became a systemic risk when the French power lines connected to central Germany's, or when Dublin's electrical lines connected with London. These are the unknown factors of systemic risk and non-agentic power. What is known, however, is the cascading effects of one emergent unit within the network, and its detrimental consequences on the rest.

This systemic failure extends much deeper than connected networks and complex systems. Every agent living in the 'blackout' areas shown above were presumably affected. As a result of the blackout, agentic behaviors were changed – people couldn't go to work, cook dinner, or watch TV. This change of behavior is connected, nonlinearly,

to the non-agentic power of the European electric grid. With each new connected grid, the European electricity network became closer to a large blackout event; in many ways, these additions are emergent units. In the next sub-section, we will be discussing how emergent factors materialize, and how they interact with the social and cultural systems.

A. Attractors

Attractors create energies that dictate how agents in the system behave. Attractors are built into societies, and in contrast to complexities, are not fluid and changing. Rather, attractors can be seen as the center, or hub, of power. **"**If a dynamic system does not move over through all possible parts of a potential or phase space but instead occupies a restricted part of it, then this is said to result from an attractor" (Urry 2003, p. 26; see also Capra 1996 Ch. 6). We see human actors constantly coming up with ideas to change society; attractors are the driving force behind how actors think and act. We can look to Baker's theory of "centriphery" (1993) to further explain the notion of attractors.

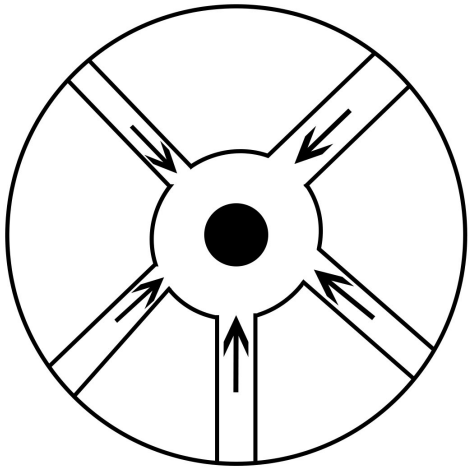


Figure 5: Centriphery

The centriphery is a transfer of energy, information, capital, and ideas in which actors are attracted to the centriphery of a system—the center. This, in turn, creates an "entropy" where the peripheries of the circle are left disadvantaged by the unstoppable mass migration toward the attractor. The centriphery is a very powerful notion; centering becomes an uncontrollable force that agents simply act in accordance with. Baker writes:

> Centering, then is an 'attractor', creating order by funneling energy and information towards itself and disorder by peripheralizing its environment. It produces a world on the periphery where the flow of energy and information is away to somewhere else…the center has an entropic effect on the periphery, causing increased randomness and increasing amounts of unusable resources. (Baker 1993, p. 139)

One example of 'centriphication' is the agglomeration of the technology industry in Silicon Valley. Unconsciously, but rapidly, Silicon Valley became the hub – the centriphery – of power for technology. Why Silicon Valley? Why not Los Angeles or New York City? The answer is within the attractor. As a result of the centriphication of Silicon Valley, it leaves companies and actors worse off on the periphery. Meaning, if a

company consciously decides to stay in New York and not move to Silicon Valley, they could be at a disadvantage. The attractor is a unique component of non-agentic power. It is notable to include there is not a "global centriphery," but rather a number of attractors that influence the way agents, networks, and collective groups act.

Once the centriphication occurs in one area, or through an idea, it then becomes an emergent factor. In the early stages of Silicon Valley's tech agglomeration, it likely could have been seen as "complex." Many agents, (start-ups and young CEO's) traveled to the Valley as a result of the attractor. Soon after, as more emergent units (larger companies, investors, and more people) arrived, the mere quantity turned Silicon Valley into a complex system. Now, one could argue that Silicon Valley has many qualities of non-agentic power. Let's probe this claim.

Silicon Valley's decisions and innovations could have a *nonlinear* effect on the rest of the global technology market. Its *collective* behavior is certainly highly interconnected, where revolving doors between start-ups and older companies are commonplace. Not to mention, its rapid growth has resulted in a complete absence of agentic *intentionality*, leading to an uncontrollable growth. Finally, the *source* of Silicon Valley's power is no longer in agentic hands, as more agents are joining the network for its *attractiveness*. It seems that, on the surface at least, Silicon Valley abides by the four dimensions of non-agentic power. Certainly this requires a deeper analysis – but as a generalization, Silicon Valley's rapid growth is exemplary in its formation and production of non-agentic power. This non-agentic emergence can be directly linked the concept of attractors.

B. Fragility

One of the main characteristics used to assess emergence and risk is *fragility*. Fragility itself is an emergent factor in a complex system; as a system grows, and more emergent pieces join, it becomes more fragile. This is a positive-feedback loop, a common characteristic of emergence. So, with more emergence, there is more fragility, making the inherent risk of failure in non-agentic power increase.

Traditionally, this concept has been viewed in an economic model of standard deviation. However, emergence does not abide by the standard deviation model.

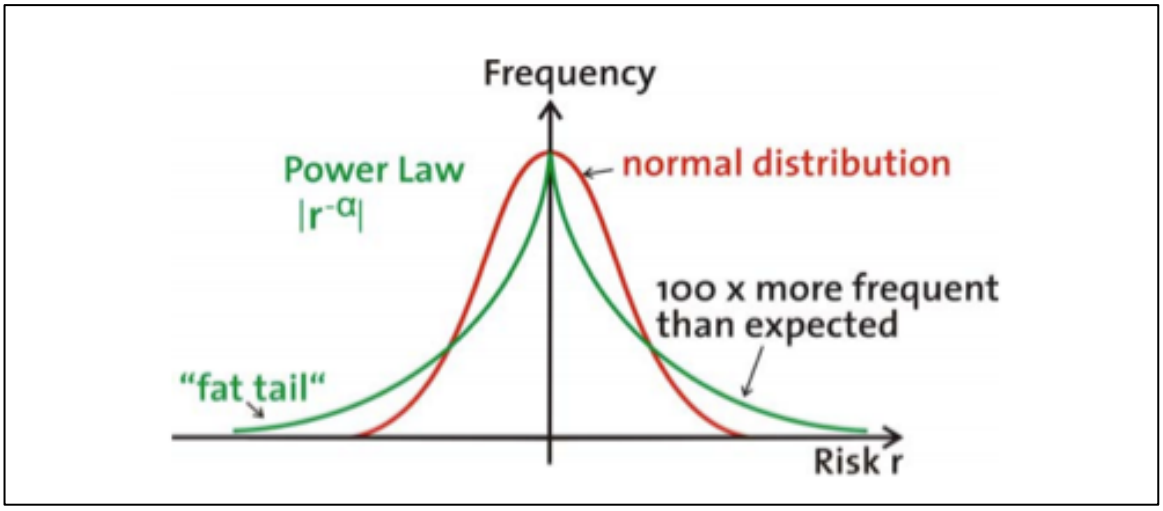


Figure 5

Figure 5: When system components interact strongly, the normally distributed behaviour of separated system elements often becomes power-law distributed of separated system elements often becomes (approximately) power-law distributed. As a consequence, fluctuations of any size can occur in the system, and extreme events are much more frequent than expected. Note that power laws are typical for a system at a critical point, known as a "tipping point".[11]

Figure 5 (Helbing 2010) represents the relationship between the size of a complex system and the potential risk of failure. A standard distribution suggests the more times

[11] Description of Figure 5 directly quoted from Helbing 2010, p. 5.

you do something, the more often you expect it to happen. This is depicted by the classic example of flipping a coin. The more times a coin is flipped, the higher probability heads and tails will be equal. This is shown with the red line, "normal distribution" in Figure 5. Yet, Helbing argues that systemic risk actually follows a fat or heavy-tailed distribution, meaning variance is unbounded and the potential for risk is more likely. As a result, with a fat tail distribution, there is more variance, more randomness, and more deviation from the mean. This fat-tail theory is seen in the green line in Figure 5, representing the possibility that big, dramatic events can happen more frequently.

This fat-tail has been illustrated in earlier examples like the global financial crisis. Although the global economy could have already been viewed 'at-risk' in 2008, it still took a large, infrequent, and unpredicted event to crash the system. Again, this tipping point is hard to pin down – was it the housing market failure, lack of regulation, rating agencies, etc. – nonetheless, the unpredictable nature of the fat-tail coincides with the decline of the global economy. Due to the complexity and interconnectivity of markets, the financial system became defenseless against the fat-tail event that 'rocked the boat.'

The fat tail description reinforces the notion that fragility is an emergent factor. The more agents that join a system, the more fragile it becomes, which is supported by the demonstration of the fat tail diagram. As the system becomes more fragile, one random event could drive the system to its brink, pushing it over the tipping point, ultimately causing a systemic failure. If less complex, the global financial system would less susceptible to systemic risk. This is undeniable. Of course, we once again see a double-edged sword, as the increase of complexity increases revenue by connecting markets, agents, and trade networks around the world.

Notably, agents *within* systems intentionally put in scaffolding to ensure it does not fail. There are outlines and protocols in order to ensure systems, buildings, and companies do not fail. Yet, as mentioned, systems themselves lack intentions and cannot always be controlled. Since non-agentic power acts in unpredictable patters, preventative measures taken by actors within the system do not always prevail.

* * * * *

In this chapter we started from a very broad perspective in viewing power by looking at complexity; we have since gone to a narrower level, looking at emergence, attractors, and fragility. In between such polarized accounts of power, we reviewed complex systems, non-agentic power, and systemic risk. Thus, we saw the entire spectrum of power is long; more importantly, the terms that characterize power are just as important as the concept itself. Without emergence, there wouldn't be complexity – and without complexity, there wouldn't be complex systems. Each of these terms are deeply interconnected, just like the networks that describe them.

The qualities of these terms certainly overlap, and these uniformities are depicted in Figure 1 that shows the funneling nature of complexity to systemic risk. Yet, the similarities are overridden by subtle nuances outlined in this chapter. Perhaps most relevant is the distinction between non-agentic power and systemic risk. We outlined the qualities of non-agentic power in Chapter 3, and described the potential hazards of systemic risk in this chapter. The relationship is a delicate one; there are features of non-agentic power that can stand alone, separate from systemic risk. Other powers, classified

in the systemic risk category, contain qualities of non-agentic power but are comprised of more emergent units.

In the next chapter, Chapter 5, we will look at case studies of the Internet of Things and determine what, if any, the conditions of risk and power are. We will be considering the following questions: Are there certain aspects of the Internet that are complex, and only complex? Are there circumstances of non-agentic power within the Internet of Things? Is the Internet an example of widespread systemic risk? What role do agents play in catalyzing risk?

Chapter 5: The Internet of Things: Case Studies of Power

* * *

The Internet of Things is an overarching term that encompasses any device that connects to the Internet, (phones, computers, tablets, handheld devices, etc.) (Cicconi). Today, the IoT is a growing and evolving classification. In 2008, the number of devices that can connect to the Internet exceeded the number of humans on earth (Ibid). Any device that has Internet capability, transfers data, and connects with other networks, is simply, a thing of the Internet. All of these devices fall into the contemporary category known as the IoT. With new innovations being introduced, the IoT is on a path of unprecedented development. In 1993 there were roughly 50 websites on the Internet. By the year 2000, there were over five million (Nye 2011, p. 114). Websites aren't the only things growing and expanding. Technological fashion is a recently booming industry with the rise of Apple Watch, Fitbit, and Garmin, where watches and bracelets can track GPS signals, heart rates, and steps per day. All of this data can be uploaded to the Internet with a simple click. Technologies are now even produced for animals; if an animal gets sick, a data signal can be immediately sent to its owner or farmer as an alert (Hardy 2015). These cutting-edge devices are all new ways for agents to connect, interact, and communicate with the aid of the Internet.

As discussed in the previous chapter, the progression of complexity diminishes the importance of time and space. Complex things do not claim territories or respond to lapsed time. Complexities do, however, vary in *use* and *purpose*. As displayed in Figure 1 in the previous chapter, a complex entity is the broadest in the conversation of power, followed by complex systems, non-agentic power, and systemic risk. In this chapter, we will look at the Internet of Things (IoT), and analyze how it can fall into any one of these categories, based on which microcosm we look at. Essentially, we will be looking at different 'snapshots' of the IoT – each picture will give a new perspective on the power of the Internet and its complexity. It is becoming nearly impossible to classify digital information; so difficult, because the amount of online data and information increases tenfold every five years (Nye 2011). Non-agentic digital power has grown uncontrollable – almost to unimaginable lengths. Yet, through an analysis of the IoT, we can break down its complexities into different camps in attempt to simplify its span.

Efficiency is often cited as the most important outcome of technological advancement, like in the case of the IoT. Centeno (2012) echoes this sentiment by noting that efficiency is an encouraging aspect of global, systemic interconnectivity. Yet Tim O'Reilly, technology expert and founder of O'Reilly Media, says that efficiency is not the sole purpose for advancement in the IoT. Rather, "The IoT is really about human augmentation. The applications are profoundly different when you have sensors and data driving the decision-making" (Hardy 2015). The noteworthy point that O'Reilly mentions is the fact that data, not people or agents, become decision-makers in the IoT. Despite agents acting as operators and consumers, data becomes the decision-maker.

O'Reilly uses the example of Uber, which facilitates the connection between an agent and their transportation needs. In contrast to a regular taxi, passengers using Uber know precisely when their driver is coming and where they will be picked up. The entire experience is augmented for agents, and the decision-making process, from an agentic standpoint, is eliminated. Also, as innovators become closer to creating driverless and self-parking cars, agentic decisions could be a fading part of the past. Indeed, Centeno and O'Reilly would probably agree – Uber increases efficiency for both the client and driver. However, efficiency is not the *only* factor to consider with innovative technologies. Who is the decision-maker? Do agents still have power? If time is taken out of the equation, and passengers know when the Uber will arrive, does this eliminate "the unknown?" With the rise of these questions, one can no longer exclusively view complexities of the IoT through a lens of efficiency, and therefore it is necessary to broaden the scope of complex analyses.

We will move forward in this chapter using the IoT as a case study for our analysis of complexity, systems, power, and risk. For each section, we will use a case study from the IoT to contextualize each differentiation. We will start with complexity.

I. Complexity

- ***Net Neutrality***

The Internet, like the rest of agent-driven markets, is also consumer-based. This means that agents using an IoT device influence how service providers send data. This brings up the issue of net neutrality, the concept of a free and open Internet. As the Internet exists today, it is highly *complex*, free and open. A ruling against net neutrality would destroy this complexity, giving agents (particularly service providers) more power

and control over the Internet market. Before looking at the potential for agentic control over open Internet, let us first investigate the *complexity* of the IoT as it stands today.

Complex things do not belong to a space or time. Fluidity of the Internet domain is expressed through continuous transfers of information between networks. With the IoT, information that flows between service providers and IoT devices are, essentially, packages of data. Data is what connects agents, and what ultimately brings the 'product' to consumers. For example, Netflix has been a leading name surrounding the controversy of net neutrality, and reasonably so. This is because agents pay Netflix to stream movies and TV shows on numerous IoT devices. The complexity expands here, since the shows and movies that agents stream are essentially large sets of data that come from service providers like Comcast and Verizon.

The abolishment of net neutrality would give advantage to websites like Netflix, who would pay service providers for a faster connection speed. Agents using Netflix would get their data much quicker, as opposed to an agent using a disenfranchised site or company. The prospect of this reality completely destroys the notion of complexity and equality. In a free and open Internet, the fluidity of data and information flows are uncontrollable. Yet, once particular agents (the wealthy ones) begin to control the flow of information, a valuable aspect of complexity is lost: *time.*

Time and demand are profoundly related in a consumer-based market. Consumers respond based on time efficiency; nobody wants to wait an hour for a sandwich to be made at a deli, wait days in line for a ticket to a baseball game, or have a movie pause every ten minutes to buffer and load. If Netflix were able to pay service providers a

higher rate in return for faster data connectivity, the playing field would be un-evened, and *time* would become of upmost importance.

With the presence of *time*, the complexity of the Internet would diminish – perhaps even disappear. Currently, IoT complexity survives – and grows – each day with the existence of a free and open Internet. Without net neutrality, a specific hierarchy will form; with a hierarchy, comes control, a serious threat to open Internet. A pure market can't be controlled by anyone, because if you try to control it in a way that agents do not like, they can switch to another option. Yet, a few big fish could eat the small fish, posing a difficult situation for some.

The transfer of data and information is unpredictable. This is where complexity is born. If, suddenly, an agent could pay for data to be delivered quicker, then that freedom of 'timeless time' would disappear, taking complexity along with it. In February 2015 the Federal Communications Commission (FCC) upheld a ruling on net neutrality, meaning the complexity of the IoT will remain, at least for some *time.*

II. Complex Systems

- ***Open Source***

The tipping point from *complexity* to *complex systems* occurs through the quantity of emergent units. First, let's look at an example of a complex website, like Amazon, to clarify this point. On a regulated website like Amazon, there are strict rules and ownership. Additionally, software creates boundaries in which agents can and cannot act. In short, there are clear-cut roles; consumers on Amazon can browse and buy products, as well as rate and comment, contributing to its 'reputation' market. Even so, agentic capacities on Amazon are limited. Developers of the website, or moderators, are the only

agents that can change information and data on the site as well. I, for example, cannot change the price of a product on Amazon.

In this section I will outline the specifics of open source, first describing its benefits, then moving onto illustrate its potential downsides. Open source software completely dismantles the notion of agentic complexity on websites like Amazon, turning a complex website into a collective network. This is where complex systems separate from regular complexities – where the number of agents increases. Open source welcomes collaboration, joint-work, and collective involvement. In comparison to Amazon, this is radically different.

Let's use the example of a can of Coca-Cola. Coca-Cola has its ingredients listed on the back of its cans, but nobody can make Coca-Cola in their kitchen. You must have specific knowledge to reverse-engineer Coca-Cola production. As consumers, we can still enjoy Coca-Cola ourselves, but we can't reproduce it. Open source, on the other hand, is a constantly changing and evolving recipe that all agents can contribute toward (Weber 2004). Linux, for example, is the most popular and widely used open source operating system. In the year 2000, Linux had developed into a flexible and robust system used by "perhaps 20 million people worldwide, with an annual growth rate of nearly 200%" (Weber 2000, p. 4). Linux has linked agents together online through collective collaboration, thus forming a highly complex system.

The paramount example of open source in today's IoT is Wikipedia. Wikipedia is an online and *open* encyclopedia. Not only can anyone read its information, but its openness allows anyone to contribute to its over 4 million pages (Wikipedia 2014). Open source programming adds *collectivity* to a complex system, in such a way that complexity

on its own cannot achieve. In other words, complexity does not involve the number of agents that complex systems do.

Historically, the dissemination of information is extremely agentic. No more than one or two, sometimes three individuals would collectively write any single article, journal or book. Before Wikipedia, there was no such article co-authored by fifty or a hundred different people, varying from American professors to Chinese politicians and Indian mechanics. Wikipedia has shifted the norm, allowing multiple agents to connect and join a singular, functional mind. The results are extraordinary.

Possibly the most popular quality of Wikipedia is that it's free; users do not have to pay a cent to learn and contribute. But more interesting to our discussion is the question of *why* agents contribute to open source. In fact, there is no concrete incentive for agents to contribute – no compensation, recognition, or reward. Notably, in a study titled *What Motivates Wikipedians*, Oded Nov found that "fun" and "ideology" were the leading motivating factors for agents contributing their time and knowledge to Wikipedia (Nov 2007). Career advancement, on the other hand, was found to be one of the smallest factors. So, we see a fascinating dichotomy that suggests a natural tendency for agents to gravitate towards collective, open source projects. Simply put, people enjoy adding to open source, and believe in the purpose of helping others while entertaining themselves.

The tendency for agents to collectively add to a network, and enjoy doing so, is tremendously important for the growth of complex systems. The more agents that join the movement, the more complex a system will grow. This proposal that agents do not need incentives to contribute to a system is critical; it indicates that complexity can grow naturally, where actors and emergence *willingly* add to a network. The chance for

exponential development increases drastically as well. In open source, there is no need for harassment or intimidation; instead, actors gladly contribute and join as a signal to the growing attractiveness of the network's power.

Finally, complex systems and open source are mutually beneficial concepts. In the example of Wikipedia, authors can add content whenever and wherever they want; these contributions come at the gains of millions of users. Wikipedia has accelerated learning with ease, convenience, and efficiency. Yet, there is a significant downside and peril to open source as well.

Notably, the dangers of open source, in particular, are different than complex systems as a whole. In open source, the probability of a contributor making an error or potentially vandalizing web content increases. Yet, the danger relevant to *our* discussion is when an insurmountable group of agents contribute to, or join, a network. If the network becomes overloaded, or precariously interconnected, the system could be at-risk.

For example, on March 10, 2015 Wikipedia filed a lawsuit against the National Security Agency for unlawful surveillance of its users. Wikipedia founder Jimmy Wales declared the NSA's surveillance was in violation of Internet users' First and Fourth Amendments – freedom of speech and the right to privacy. The lawsuit mainly targeted the "upstream" mass-surveillance of Internet traffic by the NSA. Wales is critical of the lack of anonymity his volunteer information-provider have online, saying, "These volunteers should be able to do their work without having to worry that the United States government is monitoring what they read and write. Unfortunately, their anonymity is far from certain" (Wales2015). In certain countries, adding to specific Wikipedia pages can be dangerous and even illegal. Wales illustrates that NSA surveillance might deter an

Egyptian from editing a page on government opposition. This type of influence is once again nonlinear. By unconsciously molding his actions and thoughts, the NSA is nonlinearly connected to the Egyptian man. As such, with the NSA monitoring which agent is adding what information, it is taking the "free" and "open" aspects of Wikipedia away.

With the participation of NSA surveillance over Wikipedia, we see that this small window into the Internet cannot be fully categorized as "non-agentic" power. As a whole, the Internet is a non-agentic power, as it encompasses the four dimensions of non-agentic power. But, as Wales discussed, the NSA has transparent *intentions* to monitor and control information on Wikipedia. So while "open source" certainly embodies the *collectivity* aspect of non-agentic power, it fails to abandon intentionality and therefore falls in the "complex system" classification.

Later, we will move onto review the dimension of systemic risk by using a case study on web viruses. First, though, migrate from a complex system to an example of non-agentic power in the context of the IoT. We will use a policy study as an example of how the Internet has qualities of non-agentic power, but that could be changing.

III. Non-Agentic Power

➢ *A. Introduction*

Perhaps the most common aspect involved in the IoT is the concept of a *network*. We discussed networks in Chapter 3, criticizing the term for its vagueness and variety of uses. My critique of networks mostly revolved around the term *social networking*, which has now become a natural part of our youngest generation's vocabulary. The technical aspects of networks are quite interesting in the discussion of complexity and risk. Castells

describes the fluidity of networks, describing how agents can freely join networks upon their desire:

> A network is a set of interconnected nodes, the distance between social positions being shorter where such positions constitute nodes *within* a network as opposed to those lying outside that particular network. Networks are dynamic open structures so long as they continue to effect communication with new nodes. (Urry 2003, p. 9; see also Castells 1996)

Networks are constantly changing, in the sense that a 'node' or 'agent' can join and leave freely. We have expressed this before. Even as a node disappears, the network can rearrange and change its shape, never missing a beat. Today, the freedom agents have to join and leave networks is clearly exhibited in the IoT. With the press of a button, an agent can create a new email address, deactivate their Facebook account, write a blog, or delete a Tweet. Whether agents add or subtract from the network is somewhat irrelevant; the Internet still lives and thrives, no matter how its innumerable agents/nodes act and respond.

Information is one piece of complexities that we have not yet discussed, but in our discussion of the IoT, information is incredibly pertinent. To start the conversation on information, let's look at where information comes from, and where it goes – at least from a theoretical perspective.

When an agent engages with the Internet, we can classify this relationship as agentic. There is a singular action, like sending an email, which can be depicted as A→B. As explained, it is the collective emergence of agents that advance the complexity of a system to non-agentic power. Here, however, we are only concerned with the *information* put forth to the IoT by the agent. Once an agent puts information on the Internet, it is no longer private. Facebook posts, for example, belong to Facebook once posted online.

Online blogs might belong to WordPress or Tumblr. Private emails sent from Gmail belong to Google. The moral of the story is that privacy in the digital age is delicate and tricky. Since our overall conversation is about power, we can say it is truly difficult to discern who 'owns' what information.

In earlier chapters we have stated that the Internet exists under conditions of non-agentic power. The Internet's general makeup of networks is nonlinear and produces power through its makeup of agents, which as a collective, lacks intentions. As a whole, the Internet is significantly more powerful than the agents who contribute to it. Yet aside from agents, how can one analyze what "makes-up" the Internet? Perhaps *information* that agents disclose is the real emergent factor contributing to non-agentic power. Without information, the IoT would be powerless. No agent would engage in the Internet; agents are hungry for information, and it's one of the main reasons they use the Internet. The Internet is used for communication, as well as for education like Wikipedia. In either scenario, information can be found at-will, just by a literal "click of a button." The simplicity of garnering such information is daunting, but also useful.

As mentioned in Chapter 3, LinkedIn is a useful resource among business professionals. Now, professionals networking at a business conference can instantly 'connect' on LinkedIn, providing an opportunity for a mutually beneficial agentic relationship. With that said, agents can also search that person's name on Google. Here, there is no filtering of search results. Anything and everything the person has been involved with could appear on Google's results. This leads us to an interesting division; on the Internet, there are sites, like Facebook, where agents can regulate what others see. On other websites, agents completely give up control and privacy. Work histories,

property and financial deals, family deaths, and even credit scores – if it's out there, it is fair game to be found. And, even if an agent 'disconnects' from the network and doesn't use the Internet, perhaps by disabling their Facebook or Linkedin accounts, the information still exists. Information is forever fixed in the 'timeless time' – or is it?

- ***B. The Right-to-Be-Forgotten***

A recent discussion has emerged on whether agents have the 'right-to-be-forgotten.' That is, information that one does not want to appear on the Internet can be taken down indefinitely. This case is quite applicable to our study on the complexity of the Internet, as it brings agents to the forefront of a debate normally centralized around non-agentic power. Not only does this conundrum bring forth individuals, but also larger companies like Google.

The poster-boy of the right-to-be-forgotten is Mario Costeja Gonzalez, a Spaniard who requested an online article to be removed from the Internet. The article was from a Spanish magazine and recounts a story of an old foreclosure on Mr. Gonzalez's home that resulted in a debt he ultimately paid. In a landmark ruling in May of 2014, the European Court of Justice decided it was not the Spanish newspaper who was responsible for removing the link, but the data service provider instead: Google. According to the *New York Times*, since that ruling, Google has removed more than 250,000 links from its search results (Rosenthal et al. 2015).

The same story has unfolded for Dan Shefat, a lawyer who has lived in Paris for 30 years. Shefat has been rumored to be involved with the Serbian Mafia, conducting illicit business practices and other criminal activity. Shefat was also granted his wish by

the highest European Union Court of Justice, and the links were removed on Google France's domain (Ibid).

Still, for people like Mario Costeja Gonzalez and Dan Shefat, there is just one problem – they're not totally forgotten, yet. While Google has removed many requested links, it's only been in the citizen's home country. So, a Frenchman who has requested a link removed from Google has only been removed from Google.fr, and Germans the same on Google.de. The links still appear on non-European sites, like the American standard, Google.com.

With the EU's decision to force Google's hand, the right-to-be-forgotten is close to becoming a global reality. European judges and regulators are now heavily pressing Google to remove links, which they have to review on a case-by-case basis, on all of their servers – not just European ones. The magnitude of such a change in Internet regulation could potentially alter the way agents engage and interact with the non-agentic power of the Internet.

There is a serious precedent that could be set with a global 'right' to be forgotten. The right to forget would completely change the so-called rules of the Internet. No longer would agents be held accountable for their actions; the potential consequences of an action would be erased. Information would be skewed; while some individuals could be easily searchable, others would be ghosts of the Internet, existing fully outside of the digital world, untraceable to the common man or woman.

Indeed, the precedent could be valuable for some. If Google complies with the right-to-be-forgotten, it is likely other web monsters, like Facebook, will follow suit. Although people can already request for content on Facebook to be taken down, the right-

to-be-forgotten could pose a different policy. Unwanted pictures could disappear from the web upon a simple request, likely without the photo-owner's approval. This brings up the issue of ownership, particularly in the realm of information.

The line is blurry; who owns what information? One agent may request information to be taken down and 'forgotten,' but what if that information is shared between multiple agents or groups? The right-to-be-forgotten could actually be based on multiple agent's rights, thus posing an issue for joint-ownership. Suddenly, individuals would have freedom and control of information back, a freedom that hasn't existed since the dawn of the Internet. The digital age has been frequently attacked for its interference of personal privacy. Online, agents cannot control what is said, and whom it's said about. The right-to-be-forgotten could, potentially, restore this desired privacy back in the hands of individuals; nevertheless, it comes at a cost of free speech.

While the positives of 'forgetting' are numerable, the implications of the right-to-forget are considerable from a perspective of non-agentic power. The Internet, as we have described, is a modern non-agentic power. The collective nature of single agent's contributions changes shape constantly, through its nonlinear, cascading chain-reactions and interconnected communication networks. If agents within complex systems like the Internet are granted more control, the non-agentic power itself is highly affected.

For example, let's consider the aspect of *intentionality*, a defining quality of non-agentic power that we addressed in Chapter 3. Under the conditions of non-agentic power, agents within the system do not have *intentions*; moreover, the power itself assumes an identity without intentions, as the mere size of the power is uncontrollable by a single agent.

In a situation of agent-based power, the landscape looks quite different. In the context of A→B, and A makes B something he otherwise would not have done, A has power. This, as discussed, is Robert Dahl's version power. Yet A doesn't only have power, he also has intentions. And while the intentions of A may not be realized or completed, they still exist.

The right-to-be-forgotten brings *intentionality* back to agents; it completely interrupts the qualifications of non-agentic power, creating an alternative structure of Internet power. If agents have the power to take links down as they wish, they can completely change the shape of the Internet upon demand. While one counterargument may be that agents had controlling power before the 'right-to-be-forgotten' with blogs and Facebook posts, the difference is significant.

With the introduction of the right-to-be-forgotten, the former situation turns to the latter; non-agentic power falls back to contain many qualities of an agentic scenario. Agents certainly have intentions while interacting with the Internet daily; agents can post and take down information as they please. What makes the right-to-forget different is that agents can suddenly gain control over information that was never theirs to begin with. Agent A can write an article about himself and post it on his blog, only to delete it days later. This is an agentic situation with intentionality. Yet, if agent Q posts an article online about agent A, the right-to-be-forgotten could allow A to request the article be down. This gives control, intentions, and power back to A. The entirety of the Internet, under the conditions of non-agentic power, has been undermined by a single policy. The power agents have within the situation of the Internet as non-agentic are transposed. And, the line between privacy and free speech becomes blurred.

Moreover, the right-to-be-forgotten is linked to the advancement of technology. The change toward digitizing media over the past decade has been damaging for print newspapers. In the 'old' newspaper world, when the New York Times published a newspaper and sent millions of copies out into the world, nobody was able to erase that history. With a hard copy of information, history exists forever, and cannot be forgotten. If people can erase history with the right-to-be-forgotten, the narrative of the past is distorted. In this sense, Google becomes a gatekeeper of information, allowing some information to freely flow, while stopping, concealing, and erasing others.

In a heavily democratized world, agents have become accustomed to online free speech. Social media has opened a new door for civil liberties, allowing groups and networks to grow based on the beliefs and opinions of the actors within. But what if agents can suddenly dictate how free speech is used, and when? Currently, the right-to-be-forgotten is judged on an incident-basis, meaning that Google gets to decide exactly how a link negatively affects an individual, and why it should be removed. Yet, if the policy intensifies, the criteria could possibly extend to an uncharted territory; a new outlet could emerge that allows agents, or groups of agents, argue that links are 'offensive' simply by the language and opinions used – thus limiting free speech.

We see with the emergence of policies like the right-to-be-forgotten, a new age of agentic control within non-agentic power. This re-escalation of agentic power changes the game of the Internet, allowing more power to agents than ever before. If this happens, then the Internet could end up returning to the "complex system" stage, where agents have consciousness and intentions. Maybe agentic power is not as limited as we once thought.

IV. Systemic Risk

- **Computer Viruses**

Agentic interconnectivity has increased exponentially with the aid of the Internet. This non-agentic power certainly has its benefits of communication, efficiency, and accessibility of information, but there are inherent risks to such complex connections. The word 'systemic' alludes to the power of such interconnectivity; it refers to the risk level of the system and its potential for failure.

Systemic risk is agent-focused within non-agentic power. In other words, to assess risk, we study agents or emergent units within non-agentic power. This is essentially the aim of viewing any complex system, as discussed in Chapter 4. If one agent or emergent factor falls – the whole system will fail. This is the crux of systemic risk.

Computer viruses are a prime example of systemic risk within the IoT. There are a few different types of common viruses that we can categorize as systemic risk, each of which provide slightly nuanced conclusions on the topic. The first type of virus is a worm. Worms attack networks, a commonality between all complex systems. From a non-technical standpoint, worms infiltrate networks and corrupt everything in it; a worm affects any agent connected in a network. Worms, in contrast to traditional computer viruses, do not attach to a software program, but instead can stand-alone by impacting malware. Worms have the ability to copy on its own, often using emails to transport to new networks. In 2004, the fastest spreading computer worm spread via email; the virus was a worm called "MyDoom," also referred to as "W32/MyDoom" or "Novarg."

MyDoom infiltrated computers by agents clicking a link or opening an email attachment; in February of 2004, MyDoom had made its way into one out of every twelve email messages on the Internet. In Eastern Europe, MyDoom affected a reported 20-22% of all computers (Murno 2004).

The ability for worms to disguise themselves and penetrate networks is dangerous; worms are small agents with clear *intent* to destroy, often harming a much larger, non-agentic power. With that said, Trojan viruses are even harder to detect than worms. Trojans, named after the Trojan horse the Greeks got into Troy, are disguised viruses that sneak into computer systems. Trojans enter the 'backdoor' of computer systems allowing the virus to monitor all keystroke movements, see passwords, banking information, etc. Notably, Trojan viruses are highly linked to agents; that is, Trojans cannot do damage without the intent of another agent, such as a hacker. Yet Trojans are still linked to and affect non-agentic power, as they infiltrate and destroy large networks. If a Trojan attacks a single agent, his/her communication can be easily monitored, thus impacting a potential large, non-agentic network that the agent is connected to.

The most common viruses that attack IoT devices are self-replicating, replacing normal files with corrupt ones. Just like biological viruses attack our healthy cells, a computer virus turns innocent files to damaged and dangerous ones. Computer viruses, then, are prime examples of how quickly a harmful substance can spread, potentially destroying the entire system and every agent involved. One of the worst computer viruses of all time was named "Melissa," which reportedly affected over 20% of computers in the world. The virus was released in 1999 by David L. Smith, who later plead guilty to creating the virus and was sentenced to ten years in prison. The virus spread through

email servers, similar to MyDoom, but Melissa was not a standalone worm. The virus then emailed itself to the first fifty people in the agent's address book – a truly unconscious menace that ripped through global communication systems (Crunkish 2008).

Let's take a step back and think about the relationship between viruses and systems. Each virus varies in its code and makeup, affecting the IoT in different ways. Even so, there are countless viruses that exist within systems on a daily basis. A virus can exist and thrive within the IoT system, but still leave the networks it exists within unaffected. Admittedly, this depends on the size and power of each virus, but there are many small viruses that go undetected and are overall harmless. Many viruses become another part of the system – another emergent piece.

Is there a plausible solution to systemic risk, particularly in the context of viruses impacting the IoT? While the threat of hacking and viruses has increased, some argue that data and service providers should be including better security software in their products. Nobody feels comfortable wearing a t-shirt outside in the snowy winter; rather, people want to buy warm coats, so they know they won't get cold or sick. In essence, products should be made, if possible, with security measures built in.

On the other hand, are we only protecting ourselves against hackers? Or, when an actor joins a network, are they automatically sacrificing privacy? So maybe, Google is the real hacker – of our personal information. But, many actors are not aware that their information is being "stolen" or surveyed. As such, people are scared of their bank accounts being hacked, but not afraid of their information being sold to companies for meta-data marketing tools.

In the end, it seems as though we once again return to the relation between complexity and systemic risk. As complexes become denser, with more interconnections, the risk of systemic failure increases. As agents join networks – and visit more websites – they open themselves up to non-agentic Internet power. Yet agents also become targets of other agents like worms, Trojans, and regular computer viruses. We see here a unique blend of agentic and non-agentic power, both of which could pose benefits and potential risks.

Chapter 6: Conclusion

* * *

Robert Dahl wrote in 1957 that the concept of power should be perceived in a simple notation of agents having "power over" one another. The concept of power has come a long way. The conditions of non-agentic power are not new, but instead have grown alongside the advancement of a globalized world. The interconnectivity of technology, trade, education and communication put forth new conceptualizations – new complexities – new forms of power.

Dahl's theory may be simple, but the human condition has not always been as complex as it now appears. In the State of Nature, Dahl's theory would thrive; rudimentary human relations are clearly agentic, linear, and calculated. In a simple relationship of A and B, A's "power over" B rests on B doing something he otherwise wouldn't have done. We have illustrated the impracticality of this theory in the present day. No longer can we address A's power over B as self-employed and restricted. No agent is isolated from the network, and therefore A is connected to X, Y, and Z – each of which influence the consequences of A's action. Webs of agents and their relations has reached unprecedented density, so much that we can no longer categorize power through agentic relations. Power must be conceptualized in the context of non-agentic power.

In many scenarios, the question "who has more power?" is irrelevant. It is for this reason that Bruno Latour suggested (1986, p. 278) that power should be "abandoned" and why Joseph Naim's *The End of Power* (2013) poses the decay of traditional forms of power, (states, corporations, and political parties) creating opportunities for more unorthodox types to emerge. No, power should not be abandoned; it is crucial to understanding the causalities and complexities of global politics. However there are aspects of agentic power, specifically, that are expendable in today's system(s). One must look beyond agents in order to see the intricate globalized world we live in.

But agents are, and forever will be, the focus of power. We cannot abandon agents themselves, but can instead layer upon existing theories of power. Therefore, it is essential to recall theorists like Bachrach and Baratz, Stephen Lukes, Michael Foucault, Joseph Nye and others to see how agents have been traditionally seen as the central actors in power. And although these theorists are vital in power studies, there is room for critique.

Dahl uses the example that a layperson cannot control the flow of traffic like a policeman can. In this depiction, Dahl concludes that the policeman has more power, or "power over" a layman attempting to stop automobiles in the street. This analysis is true, and I can't deny Dahl's theory of agentic power. What Dahl does not discuss is the actual traffic. In analyzing the traffic, every actor in the street becomes another important piece to the puzzle. Every driver affects the volume of traffic; time and location are deconstructed to make the flow of cars unpredictable. And yet, as anyone who has driven on a highway knows, there is a collective dynamic to traffic flows in which cars often get entrapped in large traffic jams, some for no good reason.

Since Dahl, Weber, and Waltz theorized about power in the 1950's and 60's, the concept has grown with globalization. Bachrach and Baratz introduced a second face of power with their theory of nondecisions. In such a case, the inaction of actor A could be due to an influence of B. So, in this illustration, B has some power. Stephen Lukes extended this idea with his third face of power, where actor B could be doing something to consciously benefit A. The example we used was an intern (B) getting coffee for their boss (A). A, then, has real power over B, since B is willingly doing something for A's benefit. There is no agent forcing the intern (B) to do anything.

Duvall and Barnett have championed power studies within the field of international relations, demonstrating that power can shape the mentalities of agents and states. Duvall and Barnett's "productive" power focuses on changing mentalities. In the system of slavery, slaves could believe they are inferior to their masters simply due to the *system* and environment. In some places, 'Westerners' are treated differently. Why is this? Perhaps, Duvall and Barnett suggest, it is due to the mentality that the word aerates. Here we start to drift away from agentic notions of power, now looking at words, ideas, and potential.

Michael Foucault and Peter Morriss address power with a perspective that begins to shift from agentic action. Foucault's theory of discipline indicates that overarching authorities, like the surveillance state, could shape human behavior. Even social norms, like politeness, vary across cultures. This holds some weight of power as well.

Power is everywhere, as we are all intertwined in complex networks of relational power. Yet, if I am A and you are B in a relation of [→A→B]: What are the arrows? We are agents, but the first arrow is non-agentic. The first arrow is the force that influences

my action over you, and connects us; the influence could, perhaps, be a consequence of another agent I have never met. The first arrow could be an action resulting from an idea I had years ago. There is presence of nonlinearity here; my action over you could be connected to agents X, Y, or Z that are in different locations and times.

Foucault and Morriss reformed classical standpoints on power by decentralizing agents in their theories. Even so, they fail to address power in terms of a larger system or network. We cannot view the world based on simple relationships, but rather intertwined events. Particularly in the age of technology, where information and communications are appendages of man, no agent is completely detached from the global system. The cyclicality of causation is difficult to track; in fact, the cascading consequences lead us to the fist element of non-agentic power, nonlinearity.

Nonlinearity is an essential characteristic of non-agentic power, separating it from other theories that exist. We used an example of a boy who comes home to no food for dinner. This simple fact is a result of a series of events, all of which are connected, nonlinearly: The boy's mother was fired from her job, as her she was under pressured to let employees go after the company's poor business performance. We see that the shareholders, who sold stock, are connected to the boy with no food. Although the stockholder may not be conscious of the effects of his action, he is nonlinearly connected to the young boy.

This brings us to the next aspect of non-agentic power, intentionality. Intentionality correlates with predictability. In a simple, agentic situation, actors have salient intentions. When one person punches another, there are clear intentions; while the consequences may be unintended, the punch itself was premeditated. There is a clear

differentiation to be made here. In non-agentic power, there are no intentions. Agents do not have intentions to undermine a company when selling stock; drivers in a car do not have the intentions to cause traffic jams, and although many people contribute to it – the Internet itself does not have intentions or conscious direction. Looking at the Internet also provides an opportunity to apply the third element of non-agentic power, collectivity.

Looking at power through an agentic perspective is too limited. We have expressed this. We cannot view an event as A→B, but rather Z→G→T→R→K→A→B, and so on. Every action is multi-agentic, meaning that actors Z and B above are connected, nonlinearly, to every other actor in that sequence. And if A punches B, it may be a result of Z's initial action. Whether or not A is conscious of this consequence or not is a different question. Even so, with the addition of many diverse agents, the power of collectivity starts to take form.

We used a couple examples of collectivity to demonstrate how non-agentic power is distinguished from other concepts. Emails, for example, are agentic forms of communication. A can send an email to B, or even a group of agents (listservs). But with the introduction of social media, online social networks are extensive. Agents lose power in social media; no longer can an individual act as a "gatekeeper" by deciding whether to forward an email or not. Therefore, we have seen the rise of "non-agents" in the age of technology. Agents do not control the spread of information, though they augment its substance. There is no leader, no hierarchy, and no single location of the Internet. Its fluidity is difficult to track, and parts of the deep web are nearly inaccessible. All that is left is a collective mass of agents contributing to the Internet's extensive reach through the global system.

While the majority of our analysis attempts to answer the question, "what is power?" there is another fundamental contention: Where does power begin? Traditional theories see power's source in agentic actions. For example, A has power over B because he has more guns. Or A has more power than B because he can take his money, or tax him more. These explanations are once again limited. From a traditional perspective, A has more power than B because A has intentions to use the guns, (or at least use the threat of them). But in non-agentic power, there is no intentionality, and many more actors than just A and B. In today's world, one cannot simplify relations to A and B and their simple intentions. Globalization has complicated every relation, transaction, and position of power.

Power must be viewed through emergence. Emergence attempts break down large systems to its individual parts. So in assessment of A's power over B, we can look at the greater system that A exists within, breaking down every emergent minutia contributing to its power. Notably, non-agentic power is highly complex, which complicates reductionism – reducing the whole to its parts. Complexity, in fact, rejects the sociological practice of reduction, arguing that complex systems simply cannot be broken down. We use the example that a single person or financial institution cannot be identified as causing the recession in 2008. Instead, themes and groups of institutions can be categorized as contributing to the crisis. We can look at collective emergent properties, which are shared factors within the collective, contributing to non-agentic power. This helps us identify where power comes from. Power begins with these shared emergent properties. For example, a social networking 'group' that shares similar ideologies can contribute to the overall direction of the power, and also play a part in its

demise. Still, the complex power itself cannot be broken down to its absolute *minimal* and most *individual* parts.

Complex systems interconnect agents and increase efficiency. Communication channels, transportation, and information flows are all expedited as a result of interconnected complexes. With that said, one emergent factor of complex systems is fragility. The more agents that join a system, the more fragile it becomes. This positive feedback mechanism is unavoidable. As a result, complex systems create conditions where unexpected events happen more frequently. This could, potentially, cause a "tipping point," where a systemic risk turns to a systemic failure. These events are unpredictable, like an extreme power outage across Europe [Figure 4].

Additionally, the study of attractors contributes to emergence and source of power. Attractors create a centering energy that influences human behavior. We used the example of Silicon Valley as an attractor, potentially leaving agents on the periphery of the system (companies consciously choosing not to migrate to the Valley) at a disadvantage.

We have clearly defined non-agentic power, and contrasted it against established theories of power. Still, there are overlapping concepts of non-agentic power: complexity, complex systems, and systemic risk.

There are several reasons to define these terms. First, "non-agentic power" is an unfamiliar term in power studies. Therefore, we need to parse its differences against the other, closely related terms. Additionally, the "concept of power" is a broad topic. By looking at these different terms of complexity, risk and power, we are identifying parts that make up the body of power. For example, agentic power is one important part of

power, so we added to it. After spelling out non-agentic power, we go deeper, using case studies as reinforcement.

Complexity does not abide by specific time or space, and therefore agents are free to join and leave. We used the example of net neutrality to shed light on this fact. Net neutrality puts all agents on the same playing field, as it does not introduce *time* as a differentiating factor. If net neutrality were terminated, Internet service providers would profit from companies like Netflix with *faster* Internet speeds. This challenges the notion of complexity. Yet, with the FCC upholding net neutrality for now, the Internet looks to remain complex.

Complex systems are not present in simple, agentic relationships like Dahl talked about. Instead, complex systems have increased with the rise of technology and non-agentic power. The difference between an ordinary complexity and complex *systems* are characterized by the quantity of emergent units. Today, complex systems are displayed in open source software. Allowing any agent to contribute, the receptivity of new agents allows the system to exponentially grow. Wikipedia uses open source, creating a sizable complex system that anyone around the world can contribute to.

We used the right-to-be-forgotten as a case study for non-agentic power, demonstrating how non-agentic power slightly varies from the other concepts. The right-to-be-forgotten allows people to request removal of links that pertain to them from the Internet, thus illustrating that agentic actions may not have any consequences at all; information, also, can simply disappear from right-to-be-forgotten, showing the non-agentic power of the Internet. And finally, we explained the notion of systemic risk, not through an economic standpoint, but rather using the example of computer viruses.

Though agentic interconnectivity is beneficial in many ways, the potential for systemic failure is always looming. The question of when, where, and in how long the system will fail – that is for another study.

Power is not an equation with an answer. It exists and can be theorized, but it cannot be physically calculated. There are many layers of theoretical power, which is why we started by reviewing traditional agentic theories, and moved forward to more abstract notions of non-agents.

The concept of power is, and always will be unfinished. Scholars have accepted agentic power as a foundation of the discipline. As the world has globalized, applications of power have shifted to more conceivable non-agentic situations. Perhaps with future transformations of global systems, non-agentic power will also become an established concept of power; but, with one theory put to bed, another will arise.

We are left pondering, in awe of power's capacity to grow and reshape itself with no concept of time. How does power evolve? How does the portrait of power change? Perhaps it is not power changing, but the agents within. Our perceptions transform alongside the development of our global systems. With more agents and advanced networks forthcoming, the collective emergent properties of power are only set to change. It is imperative to respect these transformations with a careful eye, digging deeper into the heart of interconnectivities, complexities, risk, and most importantly – non-agentic power.

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