Governance
in areas of limited
statehood

Digital Affordances and Human Rights Advocacy

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Abstract:

Keck and Sikkink's boomerang model (1998) and Risse, Ropp, and Sikkink's spiral model (1999) anchor much of the scholarly debate about human rights norms propagation. At the heart of both models is "information exchange" among members of broad coalitions advocating for better compliance with human rights norms. An updated spiral model (2013) offers a more liminal, ambiguous, and conditional set of actors and processes than appeared in the first boomerang and spiral models. In this context, we consider the effects of a wide array of digital technologies on human rights NGOs advocacy work and how they affect 21st century information exchange. Traditionally, evidence in human rights investigations is collected in face-to-face meetings among activists and on fact-finding missions. We argue that clusters of digital technologies create "digital affordances" that provide nonstate actors with tools that strengthen their ability to gather scientifically grounded information that pressures noncompliant actors toward commitments with broadly shared human rights norms. As to whether this also leads to greater compliance is less clear.

Zusammenfassung:

Das Boomerang-Modell von Keck und Sikkink (1998) und das Spiral-Modell von Risse, Ropp und Sikkink (1999) bestimmen einen großen Teil der wissenschaftlichen Debatte über die Verbreitung von Menschenrechtsnormen. Beiden Modellen liegt im Kern der ‚Informationsaustausch' unter Angehörigen breiter Koalitionen zugrunde, die die bessere Einhaltung der Menschenrechtsnormen befürworten. Das aktualisierte Spiral-Modell (2013) bietet eine kontextspezifischere und mehrdeutigere Zusammenstellung von Akteuren und Prozessen, als dies in den ersten Boomerang- und Spiral-Modellen der Fall war. In diesem Zusammenhang untersuchen wir die Auswirkungen eines breiten Spektrums an digitalen Technologien auf die Advocacy-Arbeit von Nichtregierungsorganisationen im Bereich der Menschenrechte und wie diese den Informationsaustausch im 21. Jahrhundert beeinflussen. Herkömmlicherweise wird Beweismaterial bei Menschenrechtsuntersuchungen in direktem Austausch unter Aktivist/Innen und bei Erkundungsmissionen gesammelt. Unserer Argumentation zufolge schaffen Cluster von digitalen Technologien „digital affordances", die nichtstaatlichen Akteuren Werkzeuge zur Stärkung ihrer Fähigkeit verschaffen, wissenschaftlich fundierte Informationen zu sammeln, Akteure unter Druck zu setzen und sie zur Einhaltung weitgehend gemeinsamer Menschenrechtsnormen zu verpflichten. Ob dies auch zu einer besseren Einhaltung der Normen führt, ist weniger klar.

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1. Introduction[1]

Understanding the role of ideas in the conduct of human affairs is a central concern of the constructivist tradition in international relations (IR) scholarship. If, as Alexander Wendt says, "anarchy is what states make of it," we should know more about the propagation of ideas and norms in the international system (Wendt 1992). How do norms - ideas that carry with them an intersubjectively understood sense of *ought* - come to shape the behavior of states and individuals (Finnemore/Sikkink 1998; Checkel 1998)? Because of their intrinsic humanistic appeal, broad formal reach, and rich research potential, we are especially interested in human rights norms.[2] What is the relationship between formal commitments to human rights and the actual practices of states and other politically powerful actors? This question is both philosophically interesting and important to international relations research. It also has important practical implication for human rights advocacy. If human rights norms, with their broad formal and rhetorical appeal, fail to shape the behaviors of states, we would expect that other less prominent and rhetorically powerful norms will also fail. If on the other hand they are found to affect behavior, understanding how and why becomes all the more important.

Two closely related models of norms propagation and socialization have anchored much of the IR debate. First, Margaret Keck and Kathryn Sikkink's boomerang model offers an elegant, empirically grounded explanation as to how states are pressured into compliance with broadly shared human rights norms (Keck, Sikkink 1998: 154-155). In 1999, Thomas Risse, Stephen C. Ropp, and Sikkink extended the logic of the boomerang model with the spiral model (Risse et al. 1999). It explains how states transition from formal commitments to actual behavioral compliance with norms that are embodied in formal accords. Finally, in 2013, Risse and his colleagues offered a substantial revision of the spiral model (Risse et al. 2013). One of the more important revisions concerned the challenges created by limited statehood (Risse 2013).

We offer an initial exploration of the role played by digital technology in human rights advocacy in light of the new scope conditions presented by the second spiral model. The paper is broadly theoretical in nature and comes in three parts. First, we offer a review of the boomerang and spiral models. Second, we review the development of technologies that are relevant to the specification of the boomerang and both spiral models. In doing so, we rely on a more contemporary social movement research literature in our adoption of the "digital affordance" concept. Third, we offer a brief case study involving the use of remote sensing satellites by

2 There are numerous examples of formal state commitments to broadly shared human rights norms. The International Covenant on Civil and Political Rights (ICCPR) was ratified by the United Nations General Assembly 50 years ago next year. It commits signatories to respect the civil and political rights of individuals, including the right to life and the freedom of religion, speech, assembly, and due process. ICCPR - adopted 67 years ago this year - is part of the International Bill of Human Rights and the International Covenant on Economic, Social and Cultural Rights and the Universal Declaration of Human Rights (UDHR). The United Nations Convention against Torture offers another example. It was adopted by the General Assembly in December 1984 and went into force in 1987. As of 2015 it has 158 state parties.

a human rights organization. We contend that digital affordances provide traditional human rights organizations with opportunities to see and record possible violations, even when confronted with what would have been insurmountable obstacles in an earlier era.

2. Boomerang Model

According to Margaret Keck and Kathryn Sikkink's boomerang model, state and nonstate actors form broad coalitions - transnational advocacy networks (TANs) - in an effort to investigate human rights abuses and put pressure on noncompliant states. Figure one illustrates the model.
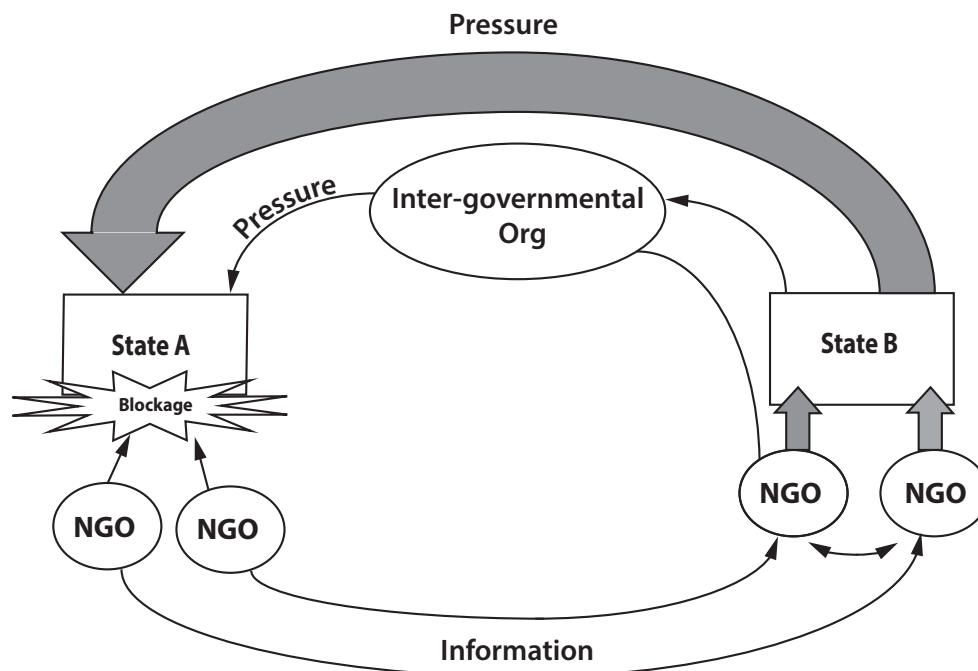
Figure One: Boomerang Model (Keck/Sikkink 1998: 13)

TANs are hybrid in composition but unified in purpose. A TAN includes "those relevant actors working internationally on an issue, who are bound together by shared values, a common discourse, and dense exchanges of information and services" (Keck/Sikkink 1998: 327-331). When aggrieved individuals and local nongovernmental organizations (NGOs) are "blocked" by the state in their efforts to have their concerns acknowledged and addressed (see State A in figure one) they turn to international human rights advocacy groups (NGOs beneath State B in figure one). These are often large, well-known international human rights organizations (INGOs) with formal and informal ties to key actors and agencies of democratic and human rights norms-compliant "State B," and to intergovernmental organizations (IOs).

The starting point is information. "At the core of network activity," write Keck and Sikkink, "is the production, exchange, and strategic use of information" (Keck/Sikkink 1998: 76). This is represented in figure one by the arrows running from the blocked local NGOs to the INGOs found beneath State B. By overcoming the "deliberate suppression of information that sustains many abuses of power, networks can help reframe international and domestic debates, changing their terms, their sites, and the configuration of participants" (Keck/Sikkink 1998: 76-79).

Pressure in the boomerang model (depicted in figure one by the large arrow running from State B to State A) comes in the form of narratives that are constructed from the evidence collected about abuses and framed in ways that maximize the reputational vulnerability of "State A." "An effective frame", note Keck and Sikkink, "must show that a given state of affairs is neither natural nor accidental, identify the responsible party or parties, and propose credible solutions" (Keck/Sikkink 1998: 440-441). A part of our argument is that the technical and scientific nature of the information gathered by human rights organizations in the 21st century strengthens this framing dynamic, making it more difficult - though certainly not impossible - for actors to deny abusive behavior.
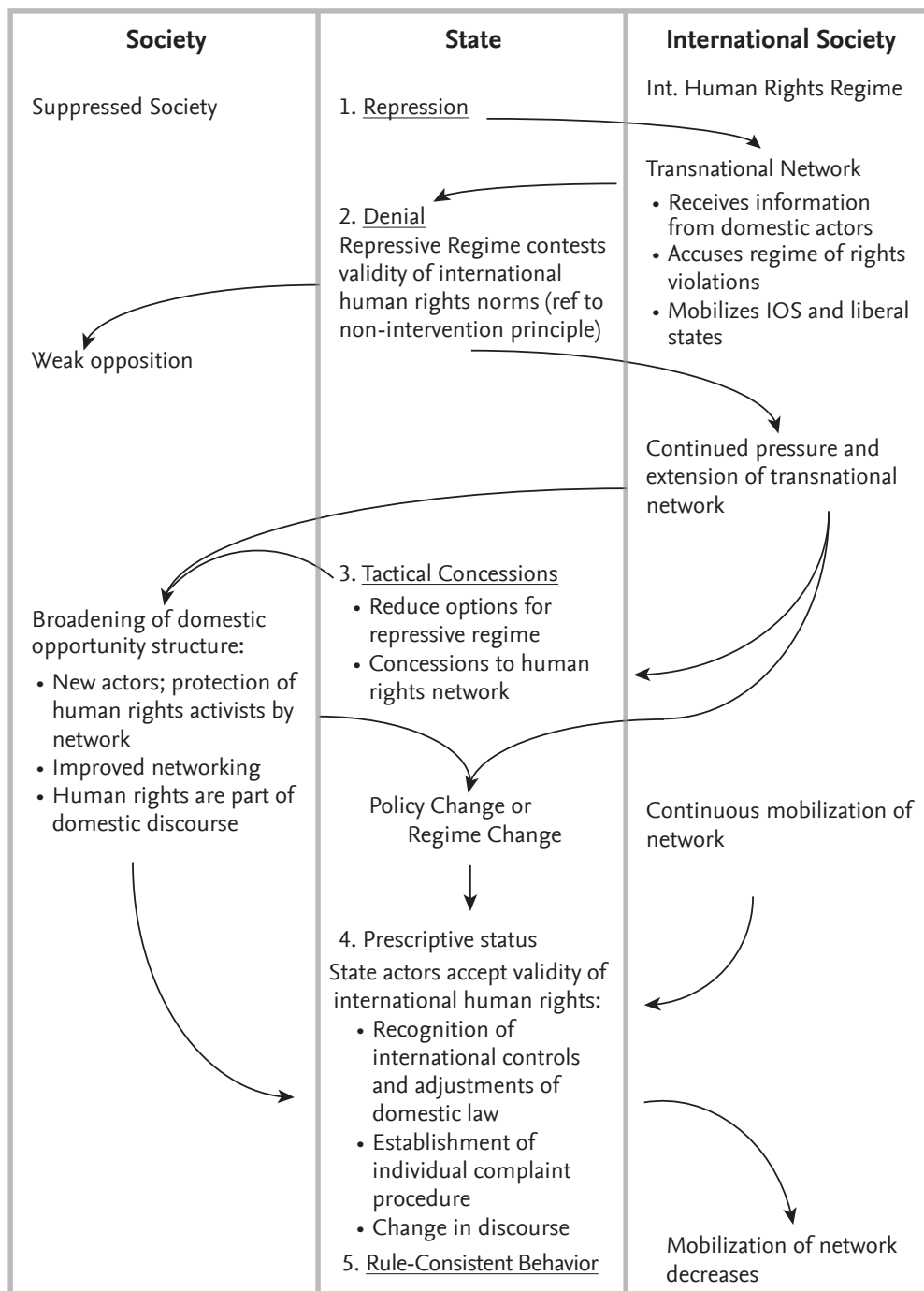

Figure Two: The Spiral Model (Risse et al. 2013: 6)

3. Spiral Models 1 & 2

The original spiral model (SM1) extends the boomerang framework by tracing the process by which a formerly noncompliant state *internalizes* new norms (Risse et al. 2013: 5). *Commitment* refers to states accepting international human rights as valid and binding (Risse et al. 2013: 9). *Compliance* is defined as "sustained behavior and domestic practices that conform to the international human rights norms" (Risse et al. 2013: 10). The spiral model specifies three processes (society, state, and international) and a path by which non-compliant states come into compliance with human rights norms over the course of five distinct phases. Each phase is enumerated in figure two.

The first three phases of SM1 are closely aligned with the dynamics described by the boomerang model. The fourth *prescriptive status* phase is characterized by a "well-defined set of state actions and associated practices" such as "ratifying relevant international treaties, changing related domestic laws, setting up new domestic human rights institutions, and regularly referring to human rights norms in state administrative and bureaucratic discourse" (Risse et al. 2013: 8). *Rule-consistent behavior*, the fifth and final phase, sees the completion of the adoption of international human rights norms (Risse et al. 2013: 8). Risse and his colleagues conclude that while human rights progress is at times uneven and the phases sometimes asynchronous, SM1 appears to be "generalizable across different types of political regimes, socio-economic systems, and cultural regions" (Risse et al. 2013: 8).

In 2013, when Risse and his colleagues returned to the spiral model with the publication of *The Persistent Power of Human Rights*, they concluded their first effort rested on three core assumptions. First, SM1 assumes that consolidated states are capable (though unwilling) of meeting international expectations concerning human rights (Risse et al. 2013: 17). Key elements of modern statehood usually include effective territorial sovereignty, a legitimate monopoly on the use of force, and the ability to authoritatively enforce political decisions. In two-thirds of states outside the Organization for Economic Cooperation and Development (OECD), these conditions do not apply, at least not fully (Risse/Lehmkuhl 2006).

Secondly, both the boomerang model and SM1 assume the presence of reliable democratic states with a record of sustained compliance with broadly shared human rights norms. This same assumption is found in other models too (see Hafner-Burton 2012; Grugel/Peruzotti 2012). Without a "State B" in the boomerang model there is no source of pressure against "State A."

Third, in the revised version of the spiral model (SM2), Risse, Ropp, and Sikkink recognize that a variety of non-state actors - corporations, private security firms, and terrorist groups - also commit human rights violations (Risse et al. 2013: 81; see also Gourevitch et al. 2012; Murdie 2014). In sum, SM2 moves the *conversation away from fixed actor and process categories to more ambiguous, liminal, and contestable conditions* (Chadwick 2013).

How do various information technologies affect the boomerang and spiral models? To address this question we turn first to a review of more contemporary research on digital technology and social movement theory. Our point here is that information exchange and pressure are quite different in the digital era. We argue that "digital affordance clusters" strengthen the ability of human rights organizations to monitor noncompliant behaviors and create compelling, scientifically grounded narratives that are used to put pressure on noncompliant actors. As to

whether this leads to compliance is less clear. Finally, digital technology opens up the possibility of new categories of "human rights organizations," ones that are digitally constituted. We will not have the time or space to address this topic in this paper.

4. Information Exchange and Digital Affordances in the 21st Century

Digital technology presents human rights organizations with opportunities to gather massive amounts of data about abuses, often from locations that are not accessible by conventional means. Information gathered in this way supplements evidence gathered by eyewitness accounts and fieldworker investigations while, in some cases, also offering information about abuses in locations that are too dangerous or remote for human rights workers and witnesses to engage directly.

The importance of data collected by technical and scientific means for human rights organizations is not limited to an expansion of access to otherwise denied-access areas. Human rights organizations now also extract entirely new kinds of information, including data in the form of *precise numerical values from previously unmeasureable relationships*, a process that has been referred to as "datafication." Datafication involves "taking information about all things under the sun and transforming it into a data format to make it quantified" (Mayer-Schönberger/ Cukier 2013: 15). Datafication unlocks previously latent or unmeasured (unmeasureable) values about relationships, including spatial, social, and genetic relationships that play an important role in contemporary human rights work.

Not only are data more complex, the sheer volume, variety and velocity of data affect contemporary information exchange. In sum, digital technologies and the data they produce allow human rights organizations to gain access to:

- Denied-access areas using tools that provide verification of eyewitness testimony when available,
- Information even when eyewitness and survivor testimony is unavailable by other means, and
- Types of data that are unavailable to other non-technical means.

We cluster different types of data and digital technology according to their "affordances," a concept borrowed by social movement scholars from design studies and from human-computer interface design (Gibson 1986; Ho/McGrenere 2000). An affordance concerns the "qualities or properties of an object that define its possible uses or make clear how it can or should be used" (Merriam-Webster Dictionary). A doorknob for example is an affordance that enables the opening and closing of a door. Yet there is nothing determinative about a doorknob; it can "afford" other uses, such as serving as a convenient hook for hanging a coat. Different affordances invite but do not necessarily *determine* particular outcomes. Social adaptations and practices influence the use of any given technology. This introduces an unsettling and ironic aspect of technology and human rights: the same technologies that expand the reach of human rights organizations can also expand the reach and efficiency of those who commit human rights abuses.

A *digital* affordance, as defined by Jennifer Earl and Katrina Kimport, is a "type of action or a characteristic of actions that a technology enables through its design" (Earl/Kimport 2011: 132). While the individual brands and devices that give rise to them change more rapidly, technological affordances evolve more slowly and involve the broad features of various categories of technology. In their study of social movements in the 21st century, W. Lance Bennett and Alexandra Segerberg describe "interactive affordances" that enable different kinds of personal political expressions, such as "features or functionalities (of a website) that enable people to do things pertaining to engagement with the protests beyond the basic affordances of reading web pages or navigating the sites" (Bennett/Segerberg 2013: 1769-1770). Some design features allow forms of interaction that others do not (Bennett/Segerberg 2013: 1766-1775). *Similarly, we group digital affordances according to their functional features, the kinds of data collection and management they make possible, and the action outcomes they enable.* We identify three digital affordance clusters that are relevant to human rights work.

1. *Digitally networked (social)*: Asynchronous coordinated actions without the necessity of physical or temporal copresence.
2. *Forensic*: reattachment of identity of the dead and disappeared despite concerted attempts to obliterate it. This is accomplished by a transformation of traces of physical existence into binary code.
3. *Geospatial*: spatial and panoptical awareness and virtual presence, even in denied access areas.

We will discuss the first two affordances briefly and then move to the third for the balance of the paper. Because of their complexity, we cannot review all three affordances in a single paper.

Digital network affordances are familiar to most contemporary social movement scholars. We take our definition from Jennifer Earl and Katrina Kimport's treatment of digital affordances in protest actions. Digital network affordances allow coordinated action toward a common goal without "copresence" in physical time and space. Stated differently, the nature of the advocacy action on digital platforms does not require the physical and temporal comingling of protesters. Online petitions offer an example of asynchronous protest actions that do not require copresence (Earl/Kimport 2011: 155-157; McPherson 2014).

Digitally networked affordances also come into play when individuals perform small, incremental tasks that contribute to the overall understanding of a situation. This is often referred as crowdsourcing or citizen science. Examples of crowdsourced data analysis include the Tomnod and Crowd4Sat geospatial analysis platforms. They invite amateurs to review satellite imagery for indicators of particular features or events. Astronomers at the University of Colorado have found that its crowdsourced platform (CosmoQuest) for mapping the lunar surface is as accurate as the maps created by NASA scientists (University of Colorado 2014). Foldit offers an example of crowdsourced biological research, while GIMPS offers the same for mathematics research (see also Ball 2014). These and many other examples all rely on the existence of digital platforms (such as a website) and massively distributed incremental contributions made by mostly amateur volunteers (Franzoni/Sauermann 2014).

Forensic affordances involve the recoding of physical materials into binary code. Though central to historians, anthropologists, criminologists, and most recently architects working in human rights advocacy, forensic affordances have remained surprisingly distant from most political communication and international relations research (Burns 1998; Joyce/Stover 1991; Snow 1982; Stover/Peress 1998; Rosenblatt 2015). In human rights work, forensic affordances include archival forensics, forensic odontology and anthropology, and, more recently, forensic architecture. Archival forensics involves the curation of documents related to human rights investigations (Doyle 2015; Weld 2014; Caswell 2014). *Digital* archival forensics involves the curation of digital data, and the reconstitution of analogue content into binary code with the use of optical scanners. Once digitized, the information is protected from physical deterioration and destruction as it is encrypted and stored on servers located in third party countries. Digitized archives are also machine readable, opening up complex network analyses of key words and names found in sometimes millions of pages of documents. This allows researchers to find patterns in the data that afford the recoding of an extirpated physical presence into data flows that rejoin the historical narrative as evidence in court proceedings and historical investigations.

Another manifestation of forensic affordances involves scientists who apply technical and scientific methods to identify human remains and establish the cause and circumstances of death. Forensic anthropologists and odontology have played a central role in identifying the remains of the disappeared and massacre victims since the 1980s. Datafication has come to this field, too. So called NextGen DNA sequencing makes use of portable machines that analyze small amounts of sample material - such as a piece of bone - to determine the identity of a missing person. Microprocessors have democratized DNA sequencing by replacing the costly and slower Sanger method of DNA sequencing with a digital process that has a much faster throughput at lower cost. One of the machines is described as combining "semiconductor sequencing technology with natural biochemistry to translate chemical information into digital data, democratizing sequencing and making it accessible to virtually any lab or clinic" (Yale School of Medicine). Here again, traces of physical existence are reconstituted as binary code.

The last part of the forensic affordance cluster involves architecture. Forensic architecture originally referred to the systematic analysis of the structural and infrastructural conditions of a building. The program on Forensic Architecture at the Center for Research Architecture at Goldsmiths, University of London refers to it as the assessment of spatial evidence and its presentation in legal and political settings. Architects, artists, and filmmakers gather and present architectural evidence within the framework of international humanitarian law and human rights (Weizmann 2007; 2011; 2014). In some measure, this particular expression of forensic affordance overlaps with the next affordance cluster.

Geospatial affordances involve spatial and panoptic awareness and virtual presence, even in denied access areas. Given the focus of an illustration below, we will spend more time describing key features of this affordance cluster. From approximately 600 km in earth orbit, satellites observe with remarkable precision the earth in areas where outsiders cannot go because of distance or danger. The data the satellites collect are also precise in their repeated observations. Much of contemporary human rights monitoring relies on geospatial affordances, from satellite

images that are georectified and orthorectified (precise in their measured relation to points on earth and corrected for distortions caused by terrain variations).[3] In September 1999, Space Imaging, Inc. launched the world's first commercial, high-resolution remote sensing satellite. Referred to as Ikonos, it offered 1-meter panchromatic and 4-meter multispectral imagery that went on the market in January 2000. Dozens more commercial satellites from several countries have followed Ikonos into orbit.

Figure Three: Examples of Satellites Offering Data on the International Market
Source: Assembled by author

Name	Launch Date	Spatial Resolution	Temporal Resolution	Country of Origin
RADARSAT-1	November 4, 1995	Variable	24 days	Canada
IRS-1C	December 28, 1995	6 meter panchromatic	24 days	India
EarlyBird-1	December 24, 1997	3 meter panchromatic 15 meter multispectral	N/A	USA
Ikonos	September 24, 1999	82 cm panchromatic 3.2 meter multispectral	3 days	USA
EROS-A	December 5, 2000	1.8 meter	N/A	Israel
QuickBird	October 18, 2001	60 cm panchromatic 2.4 meter multispectral	1 – 3.5 days	USA
Spot 5	May 4, 2002	5 meter panchromatic 10 meter multispectral	2 – 3 days	France
OrbView-3	June 2003	1 meter panchromatic 4 meter multispectral	< 3 days	USA
Carosat-1	May 5, 2005	2.5 meter panchromatic	5 days	India
EROS-B	April 25, 2006	70 cm	N/A	Israel
Cartosat-2	January 10, 2007	< 1 meter	4 days	India
Cosmo SkyMed-1	June 8, 2007	SAR [4]	Few hours in constellation	Italy
TerraSar-X	June 15, 2007	Variable, to 1 meter SAR	2.5 days	Germany
WorldView-1	September 18, 2007	.5 meter panchromatic	1.7 days	USA
Cosmo SkyMed-2	December 9, 2007	SAR	Few hours in constellation	Italy
RADARSAT-2	December 14, 2007	Variable to 1 meter SAR[5]	N/A	Canada
Cartosat-2A	April 28, 2008	< 1 meter panchromatic	4 days	India

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3 Georectification refers to the placement of an image to the coordinate system according to points in the image for which the latitude and longitude are known. Orthorectification involves taking an image in its original geometry and accurately adjusting distortions due to topographic variation.

4   COSMO-SkyMed is a constellation of four satellites (COSMO 1 – 4) with high-resolution SAR. It is possible to integrate the system with the optical satellites of the French Pléiades high-resolution optical constellation.

5 Canadian Space Agency 2010.

GeoEye-1	September 6, 2008	0.41 meter panchromatic 1.65 meter multispectral[6]	< 3 days	USA
Cosmo SkyMed-3	October 25, 2008	SAR	Few hours in constellation	Italy
WorldView-2	October 8, 2009	46 cm panchromatic 1.84 meters Multispectral:	1.1 days	USA
TanDEM-X	June 21, 2010	Variable[7]		Germany
Cartosat-2B	July 12, 2010	< 1 meter panchromatic	4 days	India
Cosmo Sky-Med-4	November 6, 2010	SAR	Few hours in constellation	Italy
NigeriaSat-2	August 17, 2011	2.5 meter panchromatic 5 meter multispectral	N/A	Nigeria
WorldView-3	Scheduled to launch on August 13, 2014	31 cm panchromatic 1.24 meter multispectral 3.7 meter short wave infrared 30 meter CAVIS[8]	< 1 day	USA
Spot 6	September 9, 2012	Panchromatic - 1.5 meter Multispectral – 6 meters (B,G,R,NIR)	1 day	France
Spot 7	June 30, 2014	Panchromatic 1.5m Multispectral - 6.0m (B,G,R,NIR)	1 day	France
Multispectral - 6.0m (B,G,R,NIR)	1 day	France		
Pleiades-1A	December 16, 2011	Panchromatic .5 meter 2-meter multispectral	< day[9]	France
Pleiades-1B	December 2, 2012	Panchromatic .5 meter 2-meter multispectral	< day	France

Digital technologies create new types of information at a scale that far exceeds traditional "information exchange." Remote sensing satellites offer a good example of this point. On three key metrics - spatial, spectral and temporal resolutions - one can see a steady advance in the technical capabilities of commercial satellites.

6 A change in orbit in 2013 changed the resolution from 41 to 46 cm panchromatic.

7 The first of the two, TerraSAR-X, has been operating since 2007. Three years on, it has been joined by TanDEM-X, a functionally compatible "twin" satellite. Flying in close formation only a few hundred meters apart, the two satellites are imaging the terrain below them simultaneously, from different angles (see Deutsches Zentrum für Luft- und Raumfahrt 2010).

8 Clouds, Aerosols, Vapors, Ice, and Snow.

9 The Pléiades satellites are the high-resolution optical imaging component of the French-Italian Orfeo system. The Pléiades and Cosmo SkyMed systems work cooperatively.

• *Spatial resolution* refers to the satellite's ability to distinguish objects on the ground. DigitalGlobe's WorldView-3 sets the current technical standard at 30-cm (about two feet) spatial resolution from about 600 km in earth orbit.

• *Spectral resolution* refers to the parts of the electromagnetic spectrum sensors can "see." Multispectral and hyperspectral sensors are able to record bandwidths well outside the range of visible light. In this way, the chemical composition of materials is discernable from orbit or from aerial platforms, such as airplanes or drones. This has multiple implications, including for human rights investigations. For example, because variations in photosynthesis of ground vegetation is detectable with multi and hyper spectral sensors, scientists are developing ways to detect mass graves through the analysis of photosynthetic variations in groundcover as decomposing bodies produce greater amounts of nitrous oxide, methane and carbon dioxide (LeBlanc et al. 2014).

• *Temporal resolution* refers to the frequency a satellite or a constellation of satellites can return to the same geospatial reference points. Whereas the Ikonos satellite in 2000 had about a three-day temporal resolution, the satellite constellations listed in figure three have near constant temporal resolution. One satellite replaces another in a pattern of near-constant observation.

Figure three does not call attention to the width and length of a swath of collected data. As a satellite passes overhead it gathers strips of data measuring several kilometers in width and usually over a hundred kilometers in length. Any point within a swath is observable in high-resolution. WorldView-2 sensors collect almost 1 million square kilometers of high-resolution imagery in a single day. WorldView-3 with a 31-centimeter resolution in the panchromatic range is capable of collecting up to 680,000 square km per day (DigitalGlobe 2014). This figure alone points to the remarkable capacity of spatial affordances to radically alter information exchange in contemporary TANs.

Imaging data of millions of square kilometers of the earth's surface are stored indefinitely. As of the spring of 2015, DigitalGlobe had sensed the entire earth seven times over (Brender 2015). Not only are these data available in near real time, they also constitute an historical record of events and processes occurring in sensed areas. Such temporal reach-back capabilities - to retrospectively watch a slow-occurring process unfold over time through an archived visual history - adds another dimension to contemporary information exchange. Should a salient feature be discovered in a satellite image, images of the same location are often archived. Once retrieved, analysts can trace changes over time, creating something of a time machine effect.

Spatial resolution alone might not matter as much as other technical characteristics, such as spectral or temporal resolution. What is analytically possible with 30-cm resolution imagery might not outweigh what can be accomplished with a one-meter spatial resolution satellite paired with greater *temporal resolution*. In other words, "good enough" one-meter spatial resolution images that are *updated rapidly* can be more important, especially in quickly evolving crises. Pleiades-1A and 1B and Cosmo SkyMed satellites operate as a constellation of compatible sensors that have rapid revisit frequencies. Yet constellations of large, super-satellites like these are expensive, with each costing about $1 billion to build and launch. Their limited numbers diminish their temporal resolution.

A different model of earth observation began to emerge in 2014, one that affects temporal resolution the most (at least as of this writing). Companies using off-the-shelf components and open-source software now build satellites weighing under 200 pounds (or about 91 kilograms). Their simplified manufacturing process and reduced weight means they are less costly to build and put into orbit. In the first half of 2014 alone, 122 satellites with masses between 1 and 50 kilograms (2.5 - 110 pounds) were place in orbit. By comparison, 92 cubesats were launches in all of 2013, with most of the growth found in the remote sensing sector (Foust 2014; SpaceWorks 2014). Analysts forecasts anticipate that 52 percent of launches between 2014 and 2016 will be devoted to remote sensing cubesats, whereas only 12 percent were used for remote sensing between 2009 and 2013 (Skybox 2013, SpaceWorks 2014). Both start-ups and established technology giants drive the growth. Skybox, which is owned by Google, launched SkySat-1 in November 2013. Planet Labs, another cubesat company, is pursuing the deployment of over 100 medium-resolution remote sensing satellites (Taylor 2014). Cubesats are pushing the democratization of remote sensing and opening it up to nonstate actors.

There are, however, important limitations to geospatial affordances. Most commercial satellites rely on passive optical sensors, meaning that they capture the reflected energy of the sun to create images of the earth. The polar or sun-synchronous orbits of the satellites puts them in perpetual daylight from their vantage point in space. Nor are most satellites capable of penetrating cloud cover or forest canopy. Energy emitting satellites such as RADARSAT-2, however, have the capacity to "see" in the dark and through limited forest canopy and cloud-cover.

Cost is another constraint to geospatial affordances. Though DigitalGlobe and other commercial vendors offer imagery at reduced rates to some civil society organizations, and even sometimes for free, imagery usually comes at a cost. On the other hand, Planet Labs' mission statement makes an explicit commitment to assisting civil society organizations.

Another possible limitation is political. It involves the possibility that commercial satellite companies will refuse to put their business relationships with powerful state clients at risk by giving or selling a compromising imagery to a human rights organization. We are not aware of such a case.

Perhaps the most important limitation involves image interpretation. Photogrammetry and even less technical aspects of satellite image analysis demands tremendous care and a keen appreciation for the limitations of what can be determined from even the most precise image. There is sometimes an inclination on the part of advocacy organizations to overstate claims based on ambiguous satellite imagery.

Our review of the growth of only one aspect of geospatial affordances - remote sensing satellites - left out important developments in geographical information systems (GIS) and geographical positioning satellites (GPS). It also left out the use of unmanned aerial vehicles by human rights organization. Yet even with this limited review we begin to see the effects of geospatial affordances on human rights advocacy.

With respect to the boomerang model, information exchange in the digital era expands and deepens traditional testimonial sources of human rights monitoring. Local NGOs remain important as sources of corroborating evidence for the photogrammetrists who analyze the satellite imagery. Several human rights INGOs make regular use of commercial remote sensing

satellite technology, including Amnesty International, Human Rights Watch, the Institute for Science and International Security, and the Satellite Sentinel Project (SSP)[10]. IOs also make use of commercial imagery, including UNOSAT program at the United Nations[11]. This means the nature of the pressure diagramed in the boomerang and spiral models has changed. Geospatial and other digital affordances present significant challenges to noncompliant political actors. We will illustrate the impact of geospatial affordance with a brief case study.

5. South Sudan and the Satellite Sentinel Project

There have been two major civil wars in Sudan (1956-1972) and (1983-2005) since it won its independence from the United Kingdom and Egypt in 1956. Then, following its own independence from Sudan, civil war in South Sudan broke out in December 2013 (World Report 2015). In an effort to deter a return to full-scale civil war between Sudan and South Sudan and to address the conflict between warring factions in the South Sudan, the Satellite Sentinel Project (SSP) began on December 29, 2010. An important part of the motivation for creating SSP were the challenges associated with monitoring the region by conventional means. As the SSP leadership put it later,

> "The information available about the events in these areas was often second-hand and largely impossible to confirm. The international community had minimal capacities for collecting impartial information and freely assisting civilians inside critical areas of Sudan due to restrictions on their freedom of movement." (Al Achkar et al. 2013: 186)

Using DigitalGlobe's sub-one meter resolution imagery, SSP was, to a degree, able to follow developments on the ground - even without direct access. SSP's reports were shared with a broad array of regional and international actors, including international and regional media outlets. This offers an example of 21st century information exchange that is quite different from what Keck and Sikkink imagined in 1998.

SSP might be thought of as a branded TAN that included the Center for American Progress (CAP), a politically progressive think tank in Washington, DC with close ties to the Obama administration. CAP's own Enough Project was another participant. It was co-founded in 2007 by Gayle Smith and John Prendergast, both of whom have had long careers as activists and government officials. Smith served in high-level positions in the Clinton administration and after cofounding the Enough Project returned to government in 2009 with a position in the Obama administration. John Prendergast, a long time human rights advocate for the South Sudan, also worked for the Clinton White House, the State Department, on Capitol Hill, the UN,

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10 Amnesty International: Remote Sensing for Human Rights, http://www.amnestyusa.org/research/science-for-human-rights/remote-sensing-for-human-rights; Human Rights Watch: North Kivu Satellite Imagery, http://www.hrw.org/node/86034; American Association for the Advancement of Science: Geospatial Technologies and Human Rights Project, http://www.aaas.org/program/geospatial-technologies-and-human-rights-project; Institute for Science and International Security, http://www.isis-online.org; Satellite Sentinel Project, http://www.satsentinel.org/reports-and-imagery

11 http://www.unitar.org/unosat/what-we-do

and for various human rights organizations. The Enough Project's experience and deep ties in the Sudan matched CAP's impressive ties to official Washington.

Another element of SSP was the Harvard Humanitarian Initiative (HHI), a project of Harvard University's T.H. Chan School of Public Health. HHI designed SSP's methodology for managing and analyzing satellite imagery and reports on events in Sudan. It also housed the initiatives at Harvard University.

Another group involved in SSP was Not on Our Watch, an organization founded in 2008 as a human rights advocacy platform for Hollywood actors Don Cheadle, George Clooney, Matt Damon, and Brad Pitt. The conventional news media's fascination with Hollywood in general and George Clooney in particular helped draw attention to SSP.

Lars Bromley of the UN Institute for Training and Research Operational Satellite Applications Program (UNITAR/UNOSAT) served as an advisor to SSP as it ramped up its analytical capabilities. Another key element, in some ways *the* key element in the TAN, was DigitalGlobe, the American corporate provider of commercial satellite imagery and geospatial data. As noted in figure three above, DigitalGlobe owns and operates some of the most sophisticated and capable satellites currently available. Finally, Trellon, a digital campaigns consulting firm, also played a role in designing the process by which the satellite imagery made its way to the SSP website.

From January 2011 to June 2012, SSP issued 28 reports documenting violence directed against civilian populations by both the Government of Sudan and the Republic of South Sudan. We focus here on one incident in particular. In July 2011, SSP found evidence "consistent with allegations that the Sudan Armed Forces (SAF) and Government of Sudan-aligned (GoS) militias have apparently engaged in a campaign of mass killing of civilians in Kadugli, South Kordofan"(Satellite Sentinel Project 2011).

> "DigitalGlobe satellite imagery analyzed by Satellite Sentinel Project shows no discernable activity at the alleged mass gravesite near Tilo School on 17 June. However, as of 4 July, three excavated areas measuring approximately 26 by 5 meters are visible less than 1 kilometer south of the Tilo School." (Satellite Sentinel Project 2011)

According to SSP, the satellite imagery corroborated information provided by eyewitnesses. The eyewitnesses claimed that the SAF and GoS-aligned militias systematically killed people suspected of supporting the Sudan People's Liberation Movement (SPLM) and others. SSP also "found evidence consistent with a possible pile of people in body bags or white plastic tarps in Kadugli" (Satellite Sentinel Project 2011).[12]

Ambassador Princeton Lyman, the U.S. Special Envoy to Sudan, said that although mass graves might exist, it was impossible to verify them because of a lack of access to Kadugli. Of course, SSP claimed that it had in fact verified local eyewitnesses accounts with evidence collected by DigitalGlobe satellites. Citing U.S. intelligence reports, Ambassador Lyman said,

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12 According to Mark Andel, an analyst with DigitalGlobe that assisted SSP in developing their analytical skills, "caveated language like this, with references to "consistent with," and "appropriate levels of certainty" were practices that "DG (DigitalGlobe) had to continually impress this upon HHI." Personal correspondence, October 14, 2015.

"We can't confirm the conclusion in the Sentinel Project that there are mass graves in Kadugli."
He continued, "what they identify as body bags, *we see those same items in those same places before
the fighting started*" (Hamilton/Sheridan 2011, emphasis added). Such a conclusion of course
threatened to damage SSP's interpretation of the images and its credibility, even with the added
support of eyewitness accounts.

SSP responded to Ambassador Lyman's statement by saying that the American intelligence
sources he cites were wrong and that the white objects were not visible in satellite images taken
just before the fighting on June 7 or 17, 2011. SSP presented DigitalGlobe images (figure four
below) in support of their assessment.

**Figure Four: Comparison Images of White Object Cluster in Kadugli (Satellite Sentinel
Project 2011)**

The left half of the image shows an area in Kadugli on June 17, 2011 - just before the fighting.
The right side of the figure shows an image acquired on July 4 of the same spot with the
white objects present. A cutout projection of the location with the objects is also provided.
The DigitalGlobe imagery shows no sign of the suspected body bags on the dates immediately
prior to fighting. To the best of our knowledge, neither Ambassador Lyman nor any American
intelligence agency offered countervailing evidence to SSP's confirmation of its interpretation
of the disposition of the white objects seen in Kadugli in July but not June 2011.

SSP also identified what it described as vehicles used by SAF and GoS-aligned forces, plus vehicles used to transport bodies to the mass gravesite. Figure five offers a satellite image released by SSP in support of this contention. In the annotation, SSP identifies what it says are vehicles "consistent with those used" by SAF and GoS-aligned forces and dump trucks used to haul bodies to the mass gravesites.

EVIDENCE OF SAF PRESENCE
The number and type of vehicles - including light vehicles and trucks - seen moving throughout Kadugli appear consistent with reports of widespread SAF and GoS-aligned militia presence. Both light vehicles and trucks appear consistent with dump trucks and other vehicles described by eyewitnesses as being used to transport bodies.

TRUCK CONSISTENT WITH DUMP TRUCK

LIGHT VEHICLES

Figure Five: Vehicles in Kadugi (Satellite Sentinel Project 2011)
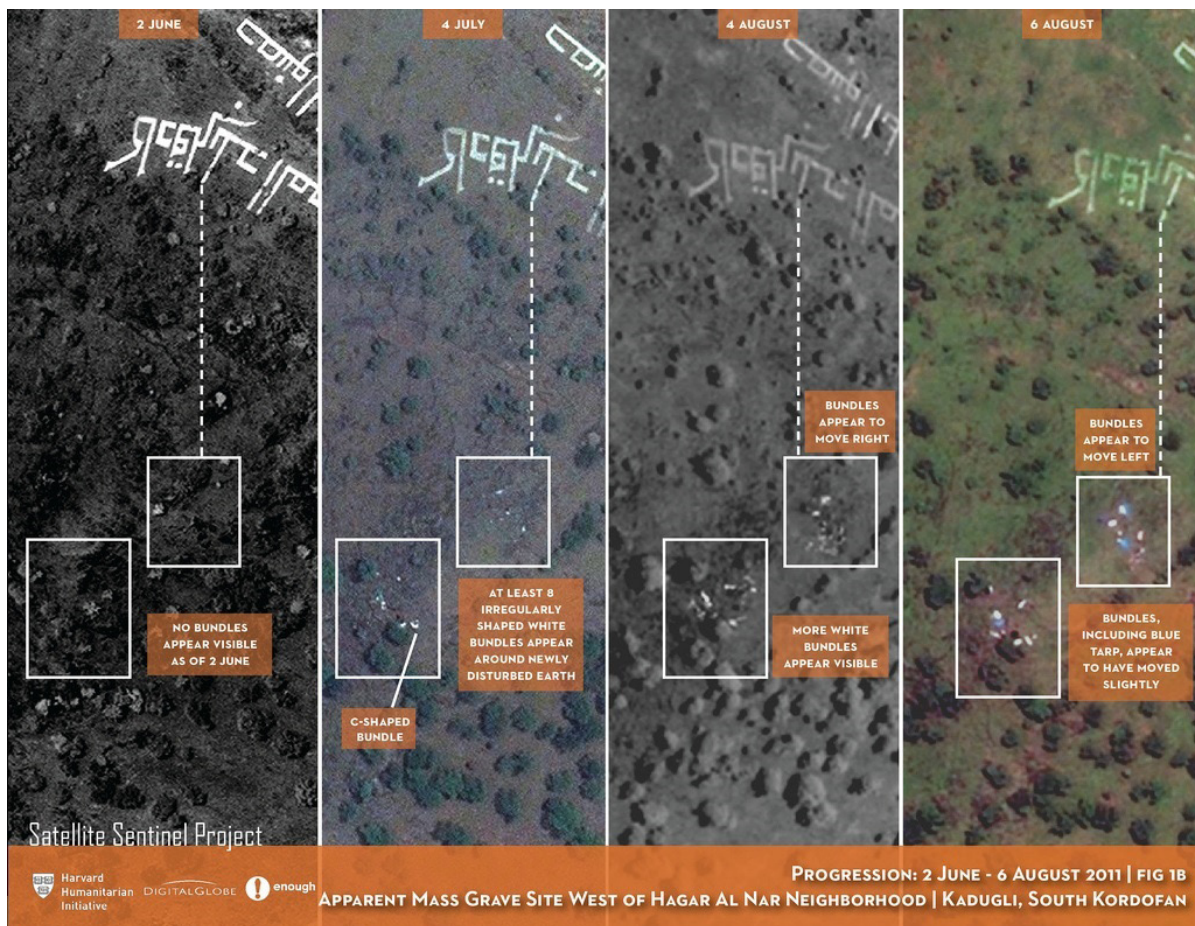
Figure Six: Revisits to Site of Suspected Mass Graves (Satellite Sentinel Project 2011)

Figure six presents a series of georectified DigitalGlobe images of the suspected mass gravesites on June 2, July 4, August 4, and August 6. White bundles "consistent to those seen in Kadugli" earlier, are visible in the last three frames. The June 2nd image, taken before the alleged massacre took place, shows no sign of the white objects.

In sum, geospatial affordance gave SSP access to physical spaces that were otherwise too distant and dangerous for direct investigation by conventional means, though eyewitnesses on the ground directed and verified the efforts to monitor events. This fits the definition of a geospatial affordance provided above. A geospatial affordance is defined as spatial and panoptical awareness and virtual presence, even in denied access areas.

6. Assessment and Discussion

How do digital affordances affect the boomerang and spiral models? The most immediate effect comes in the ability of human rights NGOs to marshal evidence in framing contests with abusive political actors. Digital affordances strengthen the ability of NGOs to gather and frame information that is intended to pressure abusive states into commitment. And what of digital affordances and human rights in areas of limited statehood? It seems that few *direct* pathways exist for digital affordance to alter commitment and compliance with human rights norms in

areas of limited statehood. We take up each of these points in the closing section below and conclude with a brief review of some of what remains to be addressed.

Framing Effects

Digital affordances have their greatest direct effect on the processes defined by the boomerang model or during the first three phases of the spiral model. Digital affordances allow *nonstate* actors to gather and curate information in ways that were once the sole preserve of the most powerful and technologically sophisticated states. This constitutes something of an epistemological power shift between state and nonstate actors (see Aday/Livingston 2009; Livingston/Klinkforth 2010). Still, more information is not necessarily the same as a capability to make uncontestable claims.

In 1999, Risse and Stephen Ropp acknowledged that the claims governments use to justify their behavior can be "viewed as arguments put forward by norm-violating governments in a public discourse with their critics" (Risse et al. 199: 262). States and other rights violators argue back. If one thinks of the boomerang model, this would suggest that the information flows going from local NGOs to State B and IOs, with "pressure" redounding back to noncompliant State A, are met by countervailing information flows. Varying "factual" countercurrents clash across the top of the model. As Anja Jetschke and Andrea Liese aver, there is also "a persuasive logic available for use by norm-violators" (Jetschke/Liese 2013: 35). This is a commonly discussed idea in communication and political communication theory. Indeed, framing and agenda dynamics (i.e., pressure) have constituted a core focus of political communication research for most of the last half-century.

Robert Entman offers what many believe to be the defining work on frames and frame contestation (Entman 2005: 96-97). What Entman calls a "substantive frame" performs certain basic functions in managing perceptions of political events, issues, and actors. A substantive frame has the following characteristics:

1. Defines social effects or conditions as problematic. There is no necessary one-to-one correlation between a harmful social condition and its status as a "problem," understood as a condition worthy of sustained public attention and social, economic and political redress (Edelmann 1988: ch. 2).

2. Identifying causes. Once a social condition is given problem status, an attribution of responsibility comes next. What explains the existence of this problem (Iyengar 1994)? Attributions empower some political actors and not others. If poverty, for example, is understood as a problem, what are its causes? If poverty is attributable to the inevitable effects of global capitalism, than agencies responsible for mitigating the harsher consequences of capitalism are empowered. If instead the cause of poverty is attributed to character defects of the poor, an entirely different set of policies and institutions are empowered.

3. Conveying a moral judgment. The answers to the first two points (problem status and attribution of responsibility) ascribe certain moral judgments. If impoverishment is understood as an inevitable outcome in the face of global capitalism, one is spared the opprobrium that would be present when understood as the result of a faulty moral character.

4. Endorsing remedies or improvements. Solutions emerge from the definition of the problem and the attribution of responsibility and moral judgments.

Digital affordances empower human rights organizations to frame conditions as problems and assign responsibility with a clear line of technical and scientific evidence to corroborate their claims. Clearer lines of attribution are perhaps also more likely to emerge as a result of the digital affordances we've identified. Still, although we cannot examine the point in depth, the digital nature of the geospatial, forensic and especially digital network affordance leaves them open to challenge by skeptics who claim that the data were misinterpreted or somehow manipulated. Chain of custody and manipulation detection software, plus the public integrity and reputation of human rights NGOs are the common means of addressing these challenges.

What about digital affordances and the challenges introduced by SM2? If we begin with a recognition of the ambiguities introduced by SM2, the first step in modeling human rights norms compliance would begin with "abuse frame" contestation - the claims and counterclaims that are so often found in international disputes - at the top of the model where human rights organizations frame acts of alleged repression and abuse in the face of denials and counterclaims made by the accused political actor. Framing contestation, however, is found at every stage of the model. Political actors are in a constant struggle to shape and control perceptions and identities, both their own and other's. Digital affordances empower human rights organizations to do that now with greater reach, a faster tempo, and with evidence that is often difficult - though not impossible - to challenge.

Areas of Limited Statehood?

How do digital affordances affect the consideration of human rights commitment and compliance in areas of limited statehood? With the complexities introduced by the reevaluation of key assumptions, the compliance stage of the spiral model faces greater challenges. Even commitment is uncertain in the absence of an authoritative governance capacity from some quarter. *There appears to be no direct pathway to compliance in most manifestations of limited statehood, even with digital affordances.* Fundamental problems persist with the stages four and five of SM2. The fourth prescriptive status phase of the spiral model (see figure two) involves "well-defined set of state actions and associated practices" such as "ratifying relevant international treaties, changing related domestic laws, setting up new domestic human rights institutions, and regularly referring to human rights norms in state administrative and bureaucratic discourse" (Risse et al. 2013: 8). Limited states lack the capacity to do some or all of these things. States with limited governance capacity might very well want to comply with human rights norms but lack the capacity to do so. "Involuntary noncompliance" is the consequence of the lack of political and administrative capacity to enforce decisions (Chayes/Handler Chayes 1993; 1995). This would include a capacity to imposition sanctions and use violence to impose binding rules on noncompliant members of the population. These of course are the very qualities that are missing in areas of limited statehood. Digital affordances supercharge the information collection phase of the boomerang or spiral model but do little to directly strengthen the capacity of noncompliant states (or other political actors) to respond.

With incapacity as the problem it would seem that the logical solution is found in creating greater capacity. Risse and Tanja A. Börzel reach this conclusion: "Therefore, capacity-building should be the primary mechanism to move a state from commitment to compliance" (Risse/Börzel 2013: 18) What sort of capacity building is needed? "Capacity-building[...] refers to a highly institutionalized process of social interaction aiming toward education, training and the building up of administrative capacities to implement and enforce human rights law" (Risse et al. 2013: 16). Building of administrative capacity seems to imply state building, something that the limited statehood literature has treated with skepticism (Fukuyama 2014; see Risse 2013). The United States' largely failed efforts at state-building in Iraq and Afghanistan, even after spending hundreds of billions of dollars, suggests that the skepticism is warranted.

What about functional equivalents to statehood? Livingston and Walter-Drop argue that digitally enabled collective action in areas of limited statehood constitutes a form of *governance* capacity building without assuming the presence of the state (Livingston/Walter-Drop 2014). Nonstate actors leverage the affordances created by mobile telephony, GPS, and GIS to coordinate actions at the community level. For example, in the absence of official crime statistics, slum dwellers in Nairobi have used GIS platforms to crowdsource reports (via mobile phones) of crimes in their community. In areas where police do not go or where they are themselves the source of crime, residents use digital maps to record instances of crime as reported by residents using mobile phones (Kovačič, Lunden 2014). This is a form of capacity building that makes use of digital affordances. Still, digitally enabled-collective action as an alternative governance modality does not produce a broadly recognized point of engagement for pressure intended to encourage compliance with human rights norms. Security provisioning in an area of limited statehood is particularly fraught with challenges. In urban slums, for instance, security provisioning typically falls to vigilante groups that protect their own ethnic identity group - often at the cost of extortion rackets - while they often inflict harm on those from other identity groups (Livingston 2013).

Clearly, building governance capacity of abusive state and nonstate authorities alike can be counterproductive. Furthermore, there is no clear roadmap to the determination of obvious outcomes. How is one to know if noncompliance is the result of incapacity, a lack of will, or both? Incapacity might very well be the most glaring manifestation of a lack of will.

If capacity building is problematic, what other avenue is present? Digital affordance might play a role in transnational advocacy to invoke the emerging responsibility to protect norm. The Responsibility to Protect (R2P) principle was affirmed in 2006 with the unanimous adoption of Resolution 1674 by the United Nation Security Council and by its reaffirmation in Resolution 1894, adopted in November 2009 (Bellamy 2015: 7). R2P holds that sovereign states have a responsibility to protect their own populations from genocide, war crimes, ethnic cleansing, and crimes against humanity. They also have the responsibility to intervene where the state fails to do so. If the state lacks "the physical capacity and legitimacy needed to protect their populations from these crimes," U.N. member states have an obligation to intervene in the place of the incapable state (Bellamy 2015: 2).

The clearest example to date of R2P came in 2011 in Libya. UN Security Council Resolution 1970, adopted on February 26, 2011, called on Libya to respect the rights of its citizens. With the failure of the Libyan authorities to comply with resolution 1970, Resolution 1973 was adopted

by the Security Council on March 17, 2011. The resolution expressed "grave concern at the deteriorating situation, the escalation of violence, and the heavy civilian casualties." Almost all major human rights organizations used geospatial and networked affordances in the period leading up to the employment of the R2P norm. It is of course impossible to isolate the role of INGO advocacy from the preexisting inclinations of key states to intervene in the Libya conflict (American Association for the Advancement of Science 2011). Yet the most glaring problem with R2P and human rights advocacy involves the lingering challenges associated with governance capacities of noncompliant states. As the Libya example illustrates, what happens after the R2P intervention is crucial. Something like a consolidated state that is willing to go from commitment to compliance is still needed.

Another possible incentive toward compliance, one that applies to consolidated and unconsolidated state actors and noncompliant nonstate actors alike, is found in *individual legal culpability*. Sikkink has called the development of this principle a "justice cascade." It involves a shift in the "legitimacy of the norm of individual criminal accountability for human rights violations and an increase in criminal prosecutions on behalf of that norm" (Sikkink 2011: 5) Forensic, geospatial and networked affordances are crucial to the development of evidence used in court and tribunal proceedings. Sikkink recognizes the importance of broadening forensic capacity in commenting that training of other anthropologists in the proper exhumation of graves in Guatemala, Bosnia, and elsewhere produces "both information for grieving families and evidence for prosecutions" (Sikkink 2011: 94). Here the point of attention is not a state or group but rather a leader who must consider his own culpability for the actions taken under his command. State capacity building, digitally enabled collective action as an alternative governance modality, and individual culpability all probably fall short of what is needed to get an abusive actor from commitment to compliance.

There are at least three issues that must be left to future investigation. First, we have emphasized the possible effects of digital affordances on the work of conventional human rights organizations. Another important consideration of digital affordances and human rights advocacy is found in the possibility that they enable the formation of a new kind of human rights organization, what might be thought of as "digitally constituted" organizations. These are organizations that exist mostly - if not entirely - online. Among the domestic digitally constituted advocacy organizations are MoveOn.org[13], 350.org[14], and Change.org[15]. For examples of digitally constituted human rights organizations at a global scale one might point to WikiLeaks[16], OpenLeaks[17], ExposeFacts[18], and even hacktist collectives as Anonymous and Telecomix. One of the key findings of the new social movement literature is that digitally constituted organizations and conventional organizations behave quite differently. They have

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13 http://front.moveon.org

14 http://350.org

15 https://www.change.org

16 https://www.wikileaks.org/index.en.html

17 http://www.heise.de/thema/Openleaks

18 https://exposefacts.org

different resource constraints, different membership structures, are less hierarchical, and are fluid in nature, meaning that two or more organizations, including traditional news and human rights organizations, cohere for a time around an event or issue to form hybrid organizations (Bennett/Segerberg 2011; Chadwick 2013).

Finally, beyond a brief review with references and a few fleeting examples, we have not explored digital network or forensic affordances. Nor have we looked at geospatial affordances beyond a description of one technological element of the affordance (earth observation satellites) and a brief overview of a single case. All of this will come in subsequent work.

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Research Framework

Governance has become a central theme in social science research. The Collaborative Research Center (SFB) 700 Governance in Areas of Limited Statehood investigates governance in areas of limited statehood, i.e. developing countries, failing and failed states, as well as, in historical perspective, different types of colonies. How and under what conditions can governance deliver legitimate authority, security, and welfare, and what problems are likely to emerge? Operating since 2006 and financed by the German Research Foundation (DFG), the Research Center involves the Freie Universität Berlin, the University of Potsdam, the German Institute for International and Security Affairs (SWP), the Social Science Research Center Berlin (WZB) and the German Institute for Global and Area Studies (GIGA).

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