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Transnational Advocacy Networks: A Complex Adaptive Systems Model of the Boomerang Effect

Short title: A Complex Adaptive Systems Model of the Boomerang Effect

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Abstract

We examine the costs and benefits of NGO networking using a complex systems approach and agent-based modeling to simulate the effects of NGOs’ efforts to seek influence in policy-making at home and abroad. We elaborate on the boomerang model developed by Keck and Sikkink (1998) and uncover macrolevel effects of multiple NGOs networking for policy influence in multiple states around multiple positions on the same issue simultaneously. The results of our model and simulations lead us to argue that the boomerang effect has interesting unexplored implications for NGO behavior and state policy worthy of further empirical testing. We find that networking is necessary for NGOs to change state policy, but leads to a higher likelihood of organizational collapse for NGOs. While networking leads to policy change, as is well-demonstrated within existing literature, our model suggests that efficacy comes at a cost to NGOs, which should make analysts and academics more ambivalent about the advisability of NGO networking.

Keywords: international networks, agent-based modeling; international relations; NGOs
The importance of networking to NGO success in effecting policy change has been well-documented by scholars. The question of whether networking can have other consequences for NGOs has been less explored. For instance, in the 1990s, Abolition 2000 sought to create a networked campaign to eliminate stockpiles of nuclear weapons and unwind strategies of Mutually Assured Destruction by the year 2000, following in the successful model of the International Campaign to Ban Landmines. While the ICBL was wildly, and unexpectedly, successful in eliminating a weapon deemed vital for military security, Abolition 2000 was all but defunct by 2000 (existing only as a webpage on a member organization’s website) and had reduced its goals to signing 2000 members to its network. Abolition 2000 rapidly developed a large network (within a year) but had no common voice, no staff, and no resources, remaining dependent upon two members for its survival even as its draft nuclear weapons abolition plan was greeted enthusiastically at the highest levels of the UN. Does networking systematically create negative consequences for NGOs, in addition to the benefits it brings?

In order to address this question, we examine NGO networking using an agent-based model to simulate the effects of NGOs’ efforts to seek influence at home and abroad. Our goal is to look beyond the immediate effects of one NGO’s campaign against one state to understand how policy on an issue and transnational advocacy networks (TANs) may evolve over a longer time period among a larger population of states and NGOs. We elaborate on the boomerang model developed by Keck and Sikkink (1998) and uncover macrolevel effects of multiple NGOs networking for policy influence in multiple states around multiple positions on the same issue simultaneously. The results of our model and simulations lead us to argue that the boomerang effect has interesting unexplored implications for NGO behavior and state policy worthy of future empirical testing. We find that networking abroad significantly increases the chances that
NGOs will change policy at home, but leads to a higher likelihood of organizational collapse for NGOs. While networking leads to policy change, as is well-demonstrated within existing literature, our model suggests that efficacy comes at a cost to NGOs, which should make analysts and academics more ambivalent about the advisability of NGO networking. Future empirical testing of these theoretical findings will help to extend and strengthen a growing research program on transnational NGO advocacy.

We begin by describing the boomerang model, as outlined by Keck and Sikkink (1998), and explaining why the agent-based modeling approach is appropriate to studying it. We then present our model of NGOs in international affairs, explain its assumptions, and describe the results of multiple runs of this model. Based on the results of these simulations, we propose networking has mixed effects on TANs, individual NGOs, and states. While the purpose of this paper is hypothesis generation, we discuss the empirical implications of the model and prospects for future testing. In the conclusion we revisit the value of agent-based analysis for further study of NGOs and transnational activist networks.

**The Boomerang Model of NGO Influence in International Affairs**

The boomerang pattern, as presented by Keck and Sikkink, serves as a standard model for transnational NGO behavior. Some argue that this is the most rigorous and systematic theorizing of NGO behavior to date (Florini 2000; Price 2003; Yanacopulos 2005). Furthermore, other scholars have built upon these ideas theoretically and empirically (Risse, Ropp, and Sikkink 1999; Thomas 2002; Bob 2005; Hertel 2006; Lerche 2008). Our goal is to use agent-based modeling to systematize the insights of the boomerang model in a general model of NGO networking and influence.
Keck and Sikkink (1998) posit a model of transnational advocacy networking in which domestic NGOs, when blocked from accessing their home governments, can “boomerang” around the blockage via networks with other NGOs located in more accessible countries. Domestic NGOs are generally blocked from accessing the state in less democratic countries, where formal institutions raise high barriers for NGO advocacy (up to and including the risk of death or disappearance, as was true in the prototypical case of Argentina (Sikkink 1993). Blockages can also be issue-based, when governments with incompatible issue preferences use institutions in even democratic countries to deny access for advocacy by NGOs on the other side of the issue (Keck & Sikkink 1998: 13). In order to change policy, the NGOs (in country A) then resort to networking with international NGOs (INGOs) or domestic NGOs in another country (country B) where there is greater institutional access for NGO advocacy. Networking consists of forming ties or links, both unidirectional and reciprocal, between organizations that allow the transfer of information, money, expertise, or other resources. In the boomerang model, the NGOs in country A pass information to the NGOs in country B, while the NGOs in country B advocate to their more supportive home state in favor of their common issue position as against the position of country A. While NGOs prefer to advocate and change policy in their home countries, in the absence of this option, their second preferred option is to shift their resources (information and material resources) to other NGOs in countries that are more sympathetic to their goals. In this way, the NGOs can achieve policy change at home when other NGOs, allied with sympathetic governments abroad, exert pressure on the original country (country A) to change its policy.

While the boomerang model is the most well-known example of a rich strand of research on networks on NGOs. We now know from current research that networking causes power
dynamics to emerge within and between NGOs (Hertel 2006; Carpenter 2007, 2014; Kahler 2013). We also know that some NGOs are very good at using the flexibility afforded them to move locations and circumvent political obstacles, but their home countries imprint upon their behavior (Stroup 2013; Stroup & Murdie 2013). Furthermore, large NGO mobilization campaigns have influenced policy as have quiet inside lobbying campaigns (Tallberg et al. 2013; Pallas & Uhlin 2014; Stroup 2013; Wong 2013).

Researchers have assumed that networking has uniformly positive effects for NGOs, and demonstrated in many case studies that successful NGOs had networks (Stroup 2012; Wong 2012; Wapner 1996; Florini 2001; Bob 2005; Hertel 2006; Carpenter 2007). We believe that this deserves further attention, however, as there are cases in which increased networking has imperiled organizations. In some cases, it has caused NGOs to change their focus and strategy (Lerche 2008, Huelschoff and Kiel 2012). In the most extreme cases, counterterrorism laws have held NGOs networked to named terrorist organizations accountable for aiding and abetting terrorism and legally dissolved them (e.g. KindHearts for Charitable Humanitarian Development). In less radical cases, the International Campaign to Ban Landmines and Abolition 2000 both foundered and almost folded over difficulties maintaining collaborative relationships between network partners. Stroup and Wong (2013) and Wong (2012) also demonstrate a trend towards centralization among successful NGOs that move from loose networks to more tightly controlled structures in which some organizations much give up control and autonomy. This work raises the question of whether

Based on the boomerang model, we posit that NGOs network based on issue proximity, geographic proximity, and resources. Keck and Sikkink (1998: 31, 35), while not ignoring material concerns, clearly privilege issues (in particular principled issues) as driving NGOs
behavior. We thus assume that domestic NGOs and international NGOs preferences are foremost policy change in line with their principled issues of interest, followed by material concerns. NGOs will thus share resources in order to exert influence on policy indirectly via policy change abroad rather than hoard resources at home when there is a limited chance of policy change at home. Direct influence on their home government is domestic NGOs’ first preference; only in the absence of the ability to change policy at home (because preferences are too divergent) do NGOs shift resources to exert indirect influence on policy abroad (Schmitz 2004). Geographic considerations, like resource disparities, are not directly addressed by Keck and Sikkink (1998) but are presumed to exist. The examples of advocacy and policy change by transnational advocacy networks discussed in the book are more often than not geographically concentrated (e.g. advocacy in the Sarawak and Latin American labor organizations). Additionally, evidence from the empirical literature suggests that NGOs are more likely to network with organizations in geographically proximate countries (Rohrschneider and Dalton 2002:521; Bell et al 2012; Skjelsbaek 1971). Skjelsbaek’s early findings (1971) show that NGO creation and networks were regional more than international, while more recently Rohrschneider and Dalton (2002) have found that environmental NGOs continue to prefer contacts with NGO’s in neighboring countries.

The Boomerang Model Explored: An Agent-Based Model of NGOs in International Affairs

Agent-based modeling is well-suited to examining NGOs and transnational advocacy networks due its flexibility and emphasis on the relationships between actors. In particular, agent-based modeling emphasizes spatial arrangements and networks between actors and introduces the idea of emergence. Agents in models are usually laid out in geographical space,
and the connections between them are moderated by their placement within this landscape. Spatial arrangements and the distinctive connections among agents of different capabilities in distinct locations are an inherent part of international politics. While initially located within distinct national settings targeting advocacy towards national institutions and goals, transnational connections between NGOs have created an international web which surpasses and connects the national and the global, spanning but not eliminating political and geographic boundaries. In addition, computer simulation may help us determine which criteria were the most important in shaping the current universe of NGOs. While many scholars engage in counterfactual thought experiments, these become more difficult as the system becomes more interconnected and complex and thus computers can continue what the human brain cannot visualize (Cederman 1997: 41).

Our agent-based model seeks to capture the core dynamics of the boomerang model—that is, NGOs creating networks in order to share resources across countries in the pursuit of policy change—in order to observe the consequences of that dynamic. Using the agent-based modeling program NetLogo we seek to capture the essence of transnational advocacy networks in order to examine the system-wide effects of multiple NGOs attempting to influence the policies of multiple states of different types at the same time. We are interested in whether networks bring about policy change, as suggested by Keck and Sikkink, and whether there are other implications of networking for states and NGOs. Does undirected networking according to the principles of the boomerang model make for an effective NGO system, despite the lack of centralized planning or global intention?

We model a simplified international system containing multiple states with different resource endowments, domestic regime types, and issue preferences. The basic logic of the
model is traced in the flowchart in Figure 1. The model begins by setting up a world of states and two types of NGOs: domestic (DNGOs) and international (INGOs). In this world, both types of NGOs campaign on a single issue; states are only concerned about making decisions on this issue, and all NGOs are treated as single issue groups. We kept the issue space single-dimensional in this version of the model in order to keep the model simple.

There are twenty-five states in the model, each represented by a square in a five by five grid. The edges of the world do not wrap around, thus creating natural boundaries within the system. Some states have eight neighbors, while others have three or five, depending on their placement within the grid. States have three attributes: a policy position, set as a random integer between one and ten; a resources level, set as a random integer between one and ten; and a regime type, set as democracy or a dictatorship. While these three factors do not reflect the true diversity of states, they do reflect several important elements that have been identified as important to NGO activity and success. We included variation in resource level because a number of scholars have found that states with higher resource levels are the most difficult to convince to change their policy (Simmons & de Jonge Oudraat 2001: 665-76; Rohrschneider & Dalton 2002; Thomas 2002: 26; Chasek, Porter & Brown 2010). Differentiating between democracies and dictatorships is important because of the increased difficulty of lobbying efforts in dictatorships (Jordan & van Tujil 2000; Florini 2000; Risse, Ropp & Sikkink 1999; Risse-Kappen 1995); in addition, the notion that some countries are inherently less responsive to lobbying is key to the boomerang effect (Keck & Sikkink 1998; Risse, Ropp, & Sikkink 1999; Fuentes 2004; Bob 2005; Thomas 2002). Approximately sixty percent of states in the model are
democracies, similar to the number of democracies in the world in the last few decades.iii In this model, a country’s regime type affects the ease of changing the policy within the country.

We include two types of NGOs in the model: domestic and international. We include both domestic and international NGOs in the model to capture networking effects between them as posited by Bob (2005). Differentiating between these two types is important: research suggests that INGOs differ in both their increased ability to network, due to lack of geographical constraints (Boli & Thomas 1999; Nelson & Dorsey 2007; Tarrow 2001; Rohrshneider & Dalton 2002; Jordan & van Tuijl 2000), and the increased flexibility they have in targeting their resources in a number of different countries (Bob 2005; Heins 2008; Hudson 2001; Stewart 2004). We ran the model with 10 INGOs and four different populations of DNGOS: 50, 100, 150 and 200 DNGOs. This allows us to test the effects of initial conditions on the outcomes of the model and examine whether a more densely populated international system helps or hinders NGO lobbying and survival. NGOs have two attributes: a policy position, set as a random integer between one and ten; and a resource level, set between one and twenty. Resources in our model can be both material resources, including money and staff, but also information, expertise, and technologies (such as successful tactics) (Tallberg et al. 2013); it is important to note that even these non-material resources are costly to provide. DNGOs are scattered at random over the grid of countries and thus have a geographic location or home country. INGOs are located outside of any one stateiv, and thus have fewer constraints on networking.

The preference ordering for NGOs is to first seek to change policy at home followed by networking which is in turn preferred to sharing resources to change policy abroad which is better than doing nothing. It is clear from Keck and Sikkink (1998), and even more explicitly in Sikkink (1993), that individuals working for domestic NGOs in repressive countries take great
personal risks to change policy at home. In Keck and Sikkink’s model, principled action drives NGOs’ behavior more than any organizational imperative for survival. That being said Keck and Sikkink acknowledge material factors are a consideration for NGOs. Sell and Prakash (2004), Büthe et al. (2012), and Schmitz and Mitchell (2014) also find NGOs are concerned with both principled and material factors, but principled commitments may surpass material considerations. We thus assume that while NGOs will not horde their resources, if there is the potential for policy change within their network. Networking is seen as the secondary, but still vital, mechanism by which NGOs will attempt to bring about social change.

Networking

Networking between NGOs is key to the boomerang model. The model posits that domestic and international NGOs network based upon issue proximity as specified by Keck and Sikkink (1998) and Carpenter (2007) as a means to share resources and pressure states to change policy. In our model, we incorporate several key elements of the networking strategies deployed by NGOs, as identified by NGO scholars; specifically, we focus on ideological and geographic proximity, as well as the economic situation of the NGO, in determining whether two NGOs will network with one another. Networks consist of the creation of a link between two organizations through which resources can be transferred. Networks are all formally unidirectional, but two NGOs could link both to and from one another. There is no limit on the number of network partners than any organization can have, nor is there a limit on the number of different organizations that can be joined. The nature of the network structure that emerges depends upon which DNGOs network and in what order (Murdie & Davis 2012).
INGOs and DNGOs form networks in different ways. When deciding whether to form a linkage with another DNGO, each DNGO considers whether it is ideologically proximate, geographically proximate and economically compatible. Ideological proximity is a key component to the boomerang theory; as NGOs are networking in order to campaign more effectively, they will network with those who are closest to them on the policy scale. To be *ideologically proximate*, two NGOs must have policy positions that are, at most, one point away from one another on the 0-10 point scale of policy. To be *geographically proximate*, two NGOs must be located within at least three states of one another. Boli and Thomas (1999) and Rohrsneider and Dalton (2002) find empirically NGOs tend to develop regionally, within geographically proximate countries.

Based on the findings of Bob (2005), Tarrow (2005), and Katz and Anheier (2005), we posit that rich NGOs (in the top quartile) link with rich NGOs or poor NGOs (in the bottom quartile), while very poor NGOs link with middling to very rich NGOs (in the top two quartiles), provided they share sufficient issue proximity. Two NGOs are *economically compatible* if:

a. they are both rich in financial resources, i.e. both have a resource level of fifteen or higher OR

b. one is rich and the other is poor, i.e. one possesses resources of fifteen or higher and one has resources of five or below.

In this way, NGOs network for either resources (via networks with rich organizations) or for influence (via networks with poor organizations). In order for two DNGOs to form a linkage, all three conditions must hold. In order for an INGO and DNGO to form a linkage, the two must be ideologically proximate and economically compatible; i.e. geography is not a factor in forming networks between INGOs and DNGOs. NGOs will not network when they are middle income,
too geographically distant, too ideologically different from potential partners, or both poor in resources.

Resource Exchange

According to the boomerang effect, NGOs will share resources through their networks if campaigning in their own country proves to be impossible. We incorporate this dynamic into our model of NGO behavior in order to examine its consequences. NGOs make decisions about how to use their resources based on policy distances; policy distance is the difference between a DNGO’s policy position and its host state’s policy position. Policy distance thus provides NGOs a means to assess the possibility that NGOs can influence state policy. In states in which the policy distance is large, the likelihood of access for advocacy is limited. NGOs can use the resource allocated to them at the beginning of the model in one of two ways: keep them or share them. Each DNGO has three choices: it can share money with another DNGO, it can give money to an INGO, or it can keep its resources to use for advocacy at home. In order to make this decision, the DNGO compares the distance between its policy preference and its home country’s policy to the distance between the policies of the countries of each of the DNGOs it is linked to. This dynamic is outlined in Table 1 and described in more detail below.

We assume the DNGO’s policy position must be three or less units from the policy position of the state it is trying to influence. DNGOs do not want to waste resources on lobbying campaigns at home that will make a small difference, in terms of changing the issue gap with the state, when resources used within the network might make a larger difference.
A DNGO can choose to give their money to another NGO, or it can choose to lobby in its home state. DNGOs take into account relative policy distances when deciding whether to give resources away or spend them to lobby at home. We assume that, all things considered, NGOs prefer to lobby at home; sharing their resources with NGOs in another country only makes sense if that country is more receptive to lobbying (Heins 2008; Florini 2000). If the DNGO’s position is less than twice the policy distance from a country it is linked to and it is less than three units from its own state, it chooses to lobby in its own country, as outlined in the next section.

If the DNGO’s policy distance from its own country is more than twice its distance from a country it is linked to, it chooses to give one unit of its resources to the DNGO in that country. DNGOs are geographically constrained, however, and can only share resources with NGOs in their networks. These, at least initially, are regional due to the geographic proximity constraint. Over time as networks grow, resources might be moved in a step by step fashion across the entire system, depending upon the pattern of network links that form. Sharing of resources, according to the rules above, is done in order of contact. As in the real world, resource exchange is done over time, according to limited information, without the ability for NGOs to know (much less prioritize) potential future demands for resource exchange (Van Puyvelde, Caers & du Bois 2012).

If a DNGO cannot effectively advocate at home and is too distant from network partners’ home state policies to make much of a difference by helping partners advocate abroad, then the DNGO can transfer a unit of resources to an INGO. This is analogous to a domestic NGO deciding to join an international umbrella organization to wage an international campaign if it is unable to launch a successful domestic campaign or partner with local NGOs in nearby countries (Keck & Sikkink 1998; Carpenter 2007; Sell & Prakash 2004; Bob 2005). Sikkink (1993)
demonstrates that the Amnesty International campaign against the Argentinian junta worked because local Argentinian NGOs shared resources (in the form of carefully documented information about disappearances) with AI. In other cases, the NGO networks CIVICUS and WANGO both demand dues from their members, and even the poorest members pay something, to access decision-making or gain voting rights. The DNGO must be linked to the INGO, and resources are always given to the least well off INGO it is linked to.\(^v\)

An INGO gives money to a DNGO if the DNGO has the smallest policy distance from the policy of its country of any of the DNGOs the INGO is linked to, and the DNGO’s resources are three or less. According to this rule, INGOs selectively target their resources for advocacy to cases they are likely to win and cases in which the domestic NGO needs resources badly, and thus the INGO resources are likely to make the most difference and the INGO gains the most influence (Bob 2005). INGOs thus serve as brokers, connecting networks of DNGOs (Murdie & Davis 2012), and work to keep DNGO campaigns going if they are at risk of demise.

Lobbying and State Policy Change

Each country has a policy position initially set as a random integer from one to ten. NGOs are arrayed on either the left or right side of a country’s policy position; for instance, if a country had a policy position of 6 and a DNGO had a policy position of 4, it would be considered to be to the left of the country’s policy position. Those DNGOs arrayed on the left side campaign to move the issue to the left (i.e. to lower values of issue position) and those DNGOs arrayed on the right side campaign to move the issue to the right (i.e. to higher values of the issue position). The real world parallel would be an ideological spectrum from left to right being more liberal versus more conservative, e.g. prochoice versus prolife positions on abortion.
In order to engage in advocacy, a DNGO gives one unit of its resources to campaign on either the left side or the right side of a cause in a country, depending upon its policy position. When DNGOs lobby, the resources that are contributed in that country are totaled according to whether they go in support of the left side or the right side of the issue. In each iteration of the model, each country assesses the net total resources on either the right side or the left side of the policy issue and then adjusts the state’s policy position in the way outlined below. Policy change always occurs in incremental, single unit steps in this model. All states evaluate their national policies at the same time, after NGOs have networked, shared resources, and lobbied.

In our model, states are more resistant to NGO advances if they are dictatorships and/or have divergent policy positions, thus imposing a blockage that NGOs may boomerang around as posited in the initial model (Keck & Sikkink 1998; Risse, Ropp & Sikkink 1999; Fuentes 2004). NGOs use the boomerang effect by uniting together in networks with like-minded NGOs to lobby states abroad, if not at home, by transferring resources within networks to win policy battles. We assess each NGO’s network size as well as shifts in the policy position of their home state to determine the extent to which the boomerang effect shapes advocacy. We thus can examine the outcomes and influence of NGOs with different preferences competing for influence across states with a variety of policy preferences drawing on both material resources and shared principles (Sell & Prakash 2004).

The threshold for policy change is different in democracies and dictatorships. In a democratic country, if the net total resources on the left side is greater than one quarter of the country’s economic level, it will change its policy one unit to the left; if the net total on the right side is greater than one quarter of the country’s economic level, it will change its policy one unit to the right. Policy change is thus more difficult in dictatorships than in democracies (Risse-
Kappen 1995; Evangelista 1999). Policy change is also more difficult in large, resource rich states than in small, weak states as is consistent with the findings of Thomas (2002).

Once one side has won a policy victory, the total resources on both sides are reduced to one quarter of their original size. This reflects the toll that lobbying takes on NGOs on both sides of the issue (Sell & Prakash 2004; Mahoney 2008; Florini 2000). The DNGOs on the side that wins a change of policy in its preferred direction receive resources totaling fifty percent of the targeted country’s resources. These benefits of policy change are shared among the organizations that contributed to the lobbying campaign equally. This represents the increased likelihood that NGOs will receive donations if they have policy victories or may benefit from government grant programs as a result of the policy change (Florini 2000; Skjelsbaek 1971; Feld 1972; Boli & Thomas 1999).

Attrition and Rewiring

In our model, NGOs which no longer have resources cease to exist. While NGO death is generally overlooked within the literature, the Union of International Associations finds that an average of 18% of INGOs close their doors each year. Reliable cross-national data on domestic NGOs is difficult to find, but attrition rates among DNGOs are presumed to be higher (UIA 2004; Price 2003; Boli and Thomas 1999). After checking for changes in the population of NGOs and changes in state policies, the network is rewired according to the initial networking algorithm.

These are highly stylized and abstract, simple algorithms intended to capture the basics of NGO-NGO and NGO-state interaction, but they can be interpreted in multiple ways to simulate the essence of what others have posited that NGOs do. The exchange of a unit of resources can
be interpreted as the exchange of money, labor or staff. Similarly the shift in issue position can indicate a change in the way in which the majority of decision-makers in a state think about, talk about, or vote on an issue at the sub-national or national level.

The model allows us to examine key questions raised by previous scholars. First, is networking necessary for NGO survival and/or for policy efficacy? Keck and Sikkink (1998) as well as the literature that follows imply that networks define and enable transnational NGOs and their activism, without which they could not engage in large scale policy change. While the answer to this question may be different for very local organizations—with limited mandates and arenas of action—and for service NGOs operating in specific niches, when it comes to cross-national advocacy, scholars universally believe NGOs need networks.

Second, might networking have unanticipated side-effects for the welfare of NGOs? If NGOs within a network transfer resources to where they are most likely to have an effect, might this eventually deplete some NGOs to the degree that they cannot continue to function, even as other NGOs prosper? NGOs have an incentive to use their resources to lobby at home if they can. But the boomerang pattern enables NGOs in hostile territory to move their resources abroad to other network members where they might have a greater effect on policy. If NGOs blocked by institutional or ideological barriers at home do nothing, they will die a slow death from attrition. They are driven to do something with their scarce resources, and the boomerang model may be their best hope for influence at home or abroad (Ron & Cooley 2002; Bob 2005; Jordan & Tjuil 2000; Yanacopulous 2005; Nelson & Dorsey 2007; Hertel 2006). Yet transferring resources abroad contains risks for the survival of the organization and may generate internal power dynamics among NGOs within a network (Carpenter 2007; Hertel 2006; Bob 2006). Future research can use our model to examine the impact of different strengths and structures of
network ties on the ability of NGOs to collaborate productively on campaigns and the relative benefits and risks for individual members of different network positions based on the direction and reciprocity of ties and centrality and betweenness indicators.

Three, do TANs change state policy? Alternatively, can NGOs succeed in international relations by joining with other NGOs, even if most individual NGOs cannot be shown to have any direct influence on governments’ policies or practices? Transnational networks of NGOs comprise a significant part of international civil society and the two are often conflated (Price 2003; Khagram, Riker & Sikkink 2002). Does the existence of non-governmental networks have an impact on the way in which international politics are constructed and enacted, even if NGOs are not actively engaging in lobbying or normative shaming campaigns (Lipschutz 1992; Boli & Thomas 1999)? The simple fact of NGOs’ continued existence might be counted as a victory given realist suppositions about their lack of importance and epiphenomenal nature (Mearsheimer 1994). Others argue that NGOs must change state policy to exert influence on international affairs (Stoddard 2006; Evangelista 1999; Risse-Kappen 1995). It would certainly strengthen the TAN argument if NGOs can be shown to deliberately and directly change government policy.

Model Results

Our goal in this paper is to examine the outcomes of networking and advocacy for NGO populations within and across countries. We focus on the macro effects produced by a number of NGOs following the same micro-processes. The patterns which emerge from this model provide empirically testable hypotheses which can help us understand real world outcomes. We target the effect of the linkages between NGOs and the resources available to NGOs on the survival of
NGOs and their ability to produce policy change at home from networking abroad. Each run of the model consists of 80 iterations. We analyze the results of 100 runs of the model for each set of conditions in order to separate random effects within a single run of the model from regular patterns which emerge due to the system effects. The results of the model suggest a number of interesting, empirically testable hypotheses, which we have highlighted in the text.

NGO Networking and Policy Change

Does networking abroad consistent with the boomerang model result in policy change at home? Does the boomerang model have other implications for NGO populations as well? We find that the answer to the first question is yes: networking seems to have a significant effect on policy change. On the downside, however, networking seems to shorten the lives of NGOs dramatically.

Proponents of the boomerang model have suggested that one reason for the success of NGOs is that NGOs use networks to reallocate resources to places where they can be used more effectively. The model suggests that networking and efficacy (successful policy change) are consistent with one another. In Table 2 we present the differences in policy change between those DNGOs that had no network in the beginning and no network at the end (which occurred at either the DNGO’s death or the end of 80 iterations), and those DNGOs who had links with other NGOs. We compare the average policy distance between each DNGO and its country of residence divided into two categories based on whether the DNGO was networked or not. Table 2 includes both the average policy distance at the beginning of the simulation and at the end of the simulation, when either the DNGO died or the 80 iterations finished.

[Table 2 about here]
When DNGOs have no network links, there is almost no movement in the average policy distance between themselves and their home state at the beginning and the end of the simulations. For DNGOs that are unnetworked, there is The policy distance for unnetworked DNGOs changed only between .06-.19 on the 10 point scale. Unnetworked DNGOs seem to have very little success in reducing the policy distance between themselves and their home countries. In contrast, the differences between the beginning policy distance and the end policy distance are much larger among those within networks. The policy distance of networked DNGOs declined anywhere from .63-.75. These differences are statistically significant in each case. It appears, then, that networking significantly increases the chances of bringing about policy change. Without networks DNGOs are unable to move the policy position of their home country or nearby states. In contrast with the results on death, a higher number of DNGOs in the system does not appear to affect the NGOs efficacy at moving the policy position of its state.

_Hypothesis: NGOs that form networks will be more successful in enacting policy change._

Our model of policy change provides NGOs with no necessary reason to network in order to change policy, as the total resources contributed by NGOs on one side of an issue only need to surpass a threshold (which depends upon the state) for policy change. This does not require networking among DNGOs. DNGOs network because it enables them to work towards their principled missions when they would otherwise be blocked by an unfriendly political environment. Networking also draws NGOs closer together in terms of the proximity of their policy position than is necessary for the threshold for policy change (that one side has more resources than the other). It is thus somewhat unexpected that networking occurs much more
frequently among NGOs which successfully changed policy. Murdie and Davis (2012) find that across issue areas not all NGOs network, however the vast majority do. Bridging organizations have an important role to play in generating network structure and efficacy, which is compatible with our simulation results.

In order to explore this relationship in more depth, we ran a regression of the last (80\textsuperscript{th}) iteration of the model. This model tests the effects of a DNGO’s network size on the closeness of its policy position to that of its home country. Results are presented in Table 3. We look at the number of links to other DNGOs, the number of links to INGOs, the initial number of links to other DNGOs (the starting network), the DNGO’s initial resource endowment, and the regime type of its home state.

[Table 3 about here]

Consistent with the evidence presented above, increasing the number of links to other DNGOs and INGOs decreases the policy distance between the DNGO and its host country. These results are substantively as well as statistically significant at the 99\% level across the range of conditions (initial DNGOs of 50, 100, 150, and 200). For example, when there are 200 DNGOs in the model, an increase of one link to another DNGO will decrease the policy distance by 0.27 and an increase of one link to an INGO decreases the policy distance by 1.31. Given that the policy range is only 10, this is a sizeable change. It is also noteworthy that the original size of the DNGOs network has little to no effect on the final policy distance across all of the conditions. The same is true of the original resource allocation, the effect of which is significant but small (-0.02 at the greatest). The finding that initial network and resource endowments matter relatively little or not at all is heartening for DNGOs, as this implies that the boomerang dynamic allows DNGOs to adapt more effectively to changes in their environment.
Hypothesis: Among NGOs involved in a process of networking and boomerang-like sharing of resources, initial resources will have no discernible impact on their ability to change policy in their home country.

DNGOs are not condemned by their original network structures or resource endowments. This is consistent with case studies of NGOs that grew to become major political players, including Greenpeace, Friends of the Earth, Save the Children, Amnesty International, and Human Rights Watch. Each began from humble beginnings but grew over time and, in many cases, centralized network partners into more hierarchical organizations (Clark 2001; Bob 2005; Skjelsbaek 1971; Stroup 2012; Wapner 1995).

It is also interesting to note that regime type had little effect on policy distance. The regime’s resistance to change does not affect the final policy distance. While we cannot draw strong conclusions without a higher $R^2$, and empirical testing, it seems possible that a network structure is a sufficient condition for policy change. Although it may take more work to change policy in dictatorships and other strongly opposed states, this is not a priori impossible even for relatively weak NGOs as long as networking is possible. This is consistent with the finding by Risse-Kappen (1995) that significant policy change in dictatorships is easier than in democracies. While access is more difficult to obtain, the centralized structure of decision-making increases the depth of policy change for those NGOs who can gain access.

NGO Networks and Organizational Survival
The model has thus far produced results consistent with the expectations of the boomerang model. Namely networking abroad helps NGOs produce policy change at home. The advantage of using computer simulations, however, is that it allows us to explore other implications of the boomerang model. We find that, in addition to increasing the effectiveness of DNGO lobbying, networking also increases the likelihood of a NGO dying. In other words, NGOs are sacrificed in the boomerang effect, although which NGOs will die is not predetermined nor planned by any one actor. The percentage of NGOs surviving to the 80th iteration for each of the conditions is shown in Table 4. We compare those DNGOs that had no network in the beginning and no network at the end (which occurred at either the DNGO’s death or the end of 80 iterations) with those that were in a network in at least one of those points.

Two points are apparent from Table 4. First, in every condition of the model, NGOs that are networked are far less likely to survive to the 80th iteration of the model. The differences between the networked and unnetworked NGOs are both substantive and statistically significant, ranging from a difference of approximately 30% to 45%. Second, as the number of DNGOs in the model increases, so does the difference between the networked and unnetworked DNGOs. While both types of NGO have less likelihood of survival as the system is more densely populated with DNGOs, the networked NGOs see a much more dramatic drop off in survival rates.

**Hypothesis:** NGOs that form networks and share resources in a boomerang fashion are more likely to dissolve through lack of resources.
Hypothesis: The lower the density of DNGOs in a policy area, the more likely those NGOs are to survive.

This might indicate that DNGOs survive better with less competition in the international system, despite the decrease in available network partners. The population ecology literature on NGOs provides some empirical support for this outcome of the simulations. Individual organizations in populations which are too sparse or overpopulated are less likely to thrive (Hager 1999; Hannan and Carroll 1992). NGOs are also found to face stiffer competition for resources, including donations and membership, and thus, on average, to fare less well in denser populations (Bob 2005; Mitchell 2012). Two possible dynamics within the model might account for the connection between smaller populations and lower mortality rates. First, with fewer organizations, NGOs will spend less of their resources on advocacy campaigns that might be considered “futile”—counteractive lobbying to maintain the status quo against challenges from other organizations on the opposite of the issue in a given country. Second, with fewer network partners, NGOs will form smaller networks and so will pass fewer resources within networks before they can wage an advocacy campaign that might have a successful outcome and renew their resource base. In reality, NGOs may dissolve voluntarily because they have accomplished their missions, and some like the Atlantic Philanthropies have planned their obsolescence. To the extent that they must spend, or redistribute, all of their resources to do this, our model would capture this effect. Although it is beyond the scope of this paper, it would be interesting to examine how many organizations successfully shift missions (e.g. the ICBL) versus dissolve in the face of success.

The boomerang model thus has contradictory results, producing policy change on the one hand and increasing the likelihood of death on the other. INGOs appear particularly important in both the policy change process and the probability of dying. INGOs in our model are highly
abstract, as they have no geographic location and they do not directly lobby governments. In the real world, the first is impossible and the second highly unlikely. It is interesting, then, that the INGOs continue to play such an important role. This highlights the importance of umbrella-type organizations in the system of international advocacy, perhaps serving as brokers in building and maintaining transnational advocacy networks (Carpenter 2007; Hertel 2006; Murdie & Davis 2012).

The model that we present is highly abstracted and simplifies the international system, transnational advocacy networks, and the process of political advocacy dramatically. Nevertheless, the finding that networking has such strong and consistent mixed effects—aiding advocacy but imperiling organizations—is an important challenge to existing understandings of INGOs, TANs, and political advocacy. Our model is likely to overstate the extent of NGO death within the international system, as new NGOs are born to replace old organizations, issues shift over time allowing old organizations to find new footholds for their advocacy, and organizations receive resources for more reasons than just victory in policy battles. Our purpose is not to predict a precise amount of NGO death, but to demonstrate that the organizational collapse of some NGOs is a likely outcome of transnational advocacy networks and may be an unavoidable risk for organizations interested in achieving political change.

Conclusions

In this paper we use agent-based modeling in order to examine transnational advocacy by networks of NGOs. The results of our agent-based model of the formation and operation of NGOs generate several interesting hypotheses that merit empirical testing. We find that the boomerang effect may have interesting systemic effects for NGOs which may help to explain
high death rates among the population. Competition may occur both within and between transnational advocacy networks, producing some spectacularly successful results, but at high cost for some members of the networks.

There has been no work examining the particular relationship between network connections and organizational health that we have found in the NGO literature. Carpenter (2007) and Hertel (2006) caution against the downsides of overly extensive networks, but neither imagines that networks can be as damaging to the survival prospects of DNGOs as the results of our model suggest. Future research would benefit from the development of a comprehensive international dataset on NGOs and INGOs, including data on their resources, location, issues, network partners, advocacy campaigns (both inside lobbying and mobilization events), as well as their effectiveness. Selections of this data are available at the national level (National Center for Charitable Statistics, US), within individual international organizations (UN iCOS and the EU Transparency Register), or from self-reported sources (Union of International Associations’ *Yearbook of International Organizations*), but this has not yet been aggregated across countries much less over time.

A networked approach to understanding international relations has become more prominent in recent years (Maoz 2010; Crooks et al. 2014). The work we present in this paper provides a computational analysis of one of the most important applications of networks in international relations: transnational advocacy networks. We believe this work presents interesting opportunities for further work using agent-based models to study NGOs. We encourage scholars to use this approach to examine other aspects of the NGO phenomena, particularly other aspects of NGO population ecology in the international system. Agent-based
modeling provides an exciting means to explore a number of different aspects of NGO behavior in the international system.
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Authors are given in alphabetical order.
Bibliography:


Figure 1: Flowchart of Boomerang model process

Start: NGOs and states are allocated policy positions and resources

NGOs network with one another on the basis of resources and proximity

DNGO assesses: relative resources of itself linked NGOs and policy distance from host country

INGO assesses: which linked DNGO is closest to its country’s policy and has low resources

State assesses: total lobbying resources on either side of issue relative to the economy

State decides whether to change policy

NGO assesses: their resources

If resources are zero, NGO decides to shut down

Repeat 80 times
Table 1: DNGO’s decisions about how to use their resources

<table>
<thead>
<tr>
<th>If:</th>
<th>Then:</th>
</tr>
</thead>
<tbody>
<tr>
<td>the DNGO’s policy distance is more than twice</td>
<td>the DNGO gives a unit of resource to the</td>
</tr>
<tr>
<td>its network neighbor’s policy distance</td>
<td>network neighbor</td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>the DNGO’s policy position is three or less units from the position</td>
<td></td>
</tr>
<tr>
<td>of the network neighbor’s home state</td>
<td></td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>the DNGO’s policy distance is less than three</td>
<td>the DNGO lobbies in its own home state</td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>the DNGO does not give money to lobby or to</td>
<td>the DNGO gives a unit of resource to an INGO</td>
</tr>
<tr>
<td>a neighboring DNGO</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Average Policy Distance, With and Without Networks

<table>
<thead>
<tr>
<th></th>
<th>50 DNGOs</th>
<th>100 DNGOs</th>
<th>150 DNGOs</th>
<th>200 DNGOs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>start</td>
<td>end</td>
<td>diff</td>
<td>start</td>
</tr>
<tr>
<td>Without networks</td>
<td>3.26</td>
<td>3.07</td>
<td>.19</td>
<td>3.28</td>
</tr>
<tr>
<td>With networks</td>
<td>3.47</td>
<td>2.84</td>
<td>.63</td>
<td>3.39</td>
</tr>
</tbody>
</table>

start, end, and diff values represent the average policy distance for DNGOs with and without networks.
<table>
<thead>
<tr>
<th>Table 3: Regression of Policy Distance, 80th iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Num of links to DNGOs</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>-0.33*** (0.048)</td>
</tr>
<tr>
<td>Num of links to INGOs</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>-1.03*** (0.047)</td>
</tr>
<tr>
<td>Num of links to DNGOs-start</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Num of links to DNGOs-start</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>0.04 (0.032)</td>
</tr>
<tr>
<td>Resource allocation-start</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>-0.02* (0.009)</td>
</tr>
<tr>
<td>Democracy?</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>0.10 (0.082)</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>3.25*** (0.115)</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>3,420</td>
</tr>
<tr>
<td>R²</td>
</tr>
<tr>
<td>50 DNGOs</td>
</tr>
<tr>
<td>0.192</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
*** p<0.01, ** p<0.05
Table 4: Percentage DNGOs Surviving 80 Iterations, With and Without Networks

<table>
<thead>
<tr>
<th></th>
<th>50 DNGOs</th>
<th>100 DNGOs</th>
<th>150 DNGOs</th>
<th>200 DNGOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without networks:</td>
<td>75%</td>
<td>72%</td>
<td>71%</td>
<td>66%</td>
</tr>
<tr>
<td>With networks:</td>
<td>44%</td>
<td>33%</td>
<td>26%</td>
<td>21%</td>
</tr>
<tr>
<td>Difference:</td>
<td>31%</td>
<td>29%</td>
<td>45%</td>
<td>44%</td>
</tr>
</tbody>
</table>
Abolition 2000 has since rebounded slightly, in part because of new streams of income and tighter control over the management of the campaign, the use of the name, and the coordination of events.

We use NetLogo4.0, a shareware program authored by Uri Wilensky and available from the Center for Connected Learning and Computer-Based Modeling. Our model and simulation results are available by request from either author.

We also ran the model with 50% and 75% of states in the system as democracies and repeated all of the analyses that follow. The results are very similar across all variations and none of the substantive conclusions change.

They can be envisioned as being outside of the 5x5 grid entirely, while still retaining connections to it.

This assumption is not vital for the outcome of the model. In simulations in which the INGO transferred resources to the richest DNGOs, the outcomes, as presented in Tables 2 and 3, were the same. Results are available from authors.