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ARTICLE

A Game-theoretic Hypothesis on the Relations between Victim States and Terrorist Organizations Based on the Eminue-Ufomba Model

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Abstract

This article extends the Eminue-Ufomba model of terrorist target selection in two dimensions. The original model restricts itself to the rationality of a terrorist organization in its target selection in relation to the victim state's national power. This article goes beyond this by incorporating into the model the novel concepts of endurance capacity and power forgone. Using a game-theoretic approach, this article makes an assumptive analysis of the behavior of a victim state following a terrorist demand and the actual use of threat.

INTRODUCTION

Terrorism refers to the recurrent use, or threat to use, politically motivated and clandestinely organized violence, by a group whose aim is to affect one or more psychological targets in order to make them behave in a way which the terrorist desires (Drake, 1998). Generally, the empirical study of terrorism is only a relatively new subject in social science literature. More recently, the aspect of the rationality in terrorist target selection has continued to draw attention among scholars. For example, Drake (1998) posits that ideology plays a crucial role in terrorists' target selection by supplying terrorists with an initial motive for action and provides a prism through which they view events and the actions of other people. Drake argues that ideology is a crucial factor since it provides the initial dynamic by setting out the moral framework within which they op-

erate, hence, justifying their actions. Bueno de Mesquita (2005a, 2005b), Lake (2002) Lapan and Sandler (1988), McCormick (2003) and Overgaard (1994) have examined the dynamics of terrorist decision-making processes as they interact with the state, while De la Calle and Sanchez-Cuenca (2007) uncovered the role of resource limitation and ideology of supporters in the shaping of terrorist activities (including target selection). Other studies explained the relationship between time and terrorist techniques of attack (Berman and Lantin, 2005; Bloom, 2005; Kydd and Walter, 2002; and Pape, 2003, 2005) and the linkages between state defense and pre-emptive policy and terrorist behavior, including target selection (Bandyo-padhyay and Sandler, 2011; Bernulandt and Polborn, 2010; Endlers and Sandler, 1993; Brandt and Sandler, 2010; Sandler, 2004; Sandler and Cauley, 1990). According to De Figueiredo and Weingast (2001) terrorist organizations

may select targets that provoke the state in order to create dynamics of action-repression. Such dynamics do not only provide the need to attack, but also the moral justification for such an attack (and of future attacks).

Nemeth (2010) theorized that terrorist organizations lack "bargaining interactions" with targeted governments for public support. A government needs the assent of the public to govern while terrorist organizations need public support for their existence, and this is reflected in their choice of target. Hence, Nemeth concludes that government attributes, public support and presence of competing terrorist organizations are re-occurring factors that influence terrorist organizations' violent interaction with the victim state. Going a little further, Mathews and Loweberg (2012), using a game-theoretic approach, established the linkage between terrorist target selection and the allocation of a victim state's security resources. The logic of this observation is that terrorist organizations are expected to behave rationally, and are more likely to select targets that are less defended by the state's security apparatus. (See also, Berhandt and Polborn, 2010; Power, 2007; Brandt and Sandler, 2010; Sandler and Lapan, 1988).

The literature on terrorist target selection is gradually becoming extensive. Studies on the subject have uncovered the rationality in terrorists' choice of target, and the factor(s) that shape the response of the victim state in the face of such threats or attacks (for example see: Cronin, 2009; Jones and Libicki, 2008; Eminue and Ufomba, 2011). This study will contribute to the literature by situating itself within the following theoretical problem: at what point is a victim state likely to concede to terrorists' demands on an issue it initially resisted after being attacked, and why?

Using a game-theoretic approach this article will analyze the interaction between a terrorist organization and a victim state; from the terrorist organization making its demand to an assumptive expectation of the victim state's behavior after an attack has been carried out. To achieve this, the article builds on the Eminue-Ufomba model, incorporating the novel concepts of *endurance capacity and power forgone*. As such, it is imperative to first explore the Eminue-Ufomba model, including the core assumptions that shape it.

THEORETICAL FOUNDATION AND CORE ASSUMPTION OF THE EMINUE-UFOMBA MODEL

The Eminue-Ufomba model was developed using the framework of the power transition theory (PT). Specifically, the fundamental tenet of PT is that the position of states in the power hierarchy of the international system is a function of their core components of national power:

political capacity, economic capacity and demography. As these components grow or diminish in a state in relation to other states in the power hierarchy of the international system, a state´s position in the hierarchy alters. The status of a state improves when its relative national power increases, or worsens when it decreases. This theorization, first proposed by Organski (1958) and extended into a more generalized power parity perspective by Kugler and Lemke (1996) and Tammen et al. (2000), has been extended in different directions to analyze virtually all known re-occurring issues in international and domestic politics. This theory stands out as one of the most robust theoretical and empirical explanations of war and peace (Abdollahian and Kang, 2008; Tammen, 2008). Its tenet has been applied in three fields: 1) understanding intra-state conflict management (Arbetman-Rabinowitz and Johnson, 2008), explaining conflict at different levels of analysis, such as between nation-states, regions and even sub-national units (Lemke, 2002; Abdollahian and Kang, 2008); 2) development of an integrated formal deterrence structure using a game-theoretic approach; 3) to simulate the structural conditions that lead to inter-state conflict and co-operation using a system of non-linear differential equations (Abdollahian, 1996). It has equally been adopted by Alsharabati (1997) and Lemke (2002), respectively, to develop a dynamic game-theoretic representation and a multiple hierarchy model (MHM), which explains regional conflicts, among others.

The success of PT in explaining socio-political and economic phenomena was replicated by Eminue and Ufomba (2011) in a model of terrorist target selection. This model is built on four assumptions. The core theorization is that all other things being equal, for "a terrorist organization to achieve its objective(s) of forcing a nation to make concession(s) (to its demand), it makes target selection that has a direct or, at least an indirect impact on the national power of the attacked nation" (Eminue and Ufomba, 2011, p. 378). It went further to posit that:

> "Considering that terrorist organization(s) have fewer legal, material and human resources compared to states, they optimize their resources when selecting critical targets of states - i.e. the PT components of national power […] the resources available to the terrorist organization are limited and in pursuance of its aim to compel government to comply, it will select its target(s) in such ways as to optimize their limited resources, their attacks are likely to be made against critical targets that will compel the victim nation to make concession and act in accordance to their demand(s)" (Eminue and Ufomba, 2011, pp. 378- 379).

This was represented in a mathematical formula as:

$$\int = \mathfrak{z} \leq (\gamma\ [\alpha\theta,\ \alpha\beta,\ \alpha\lambda])\ \int\Psi\pi \dots\dots\dots\dots\ 1$$

Where:

$\int$ = selected target
$\mathfrak{z}$ = resource optimization by the terrorist group
α = the relative impact on components of national power
θ = political capacity
β = economic capacity
λ = demography
$\int\Psi\pi$ = the degree of publicity and public opinion (Ψ) on attack $\int$ as a result of the demand on issue π.

Given that terrorist organizations have limited resources, the model assumes that they are likely to select targets(s) rationally, so that the impact on the victim state's components of national power will be higher than the cost of the resources used in carrying out the attack.

Unfortunately, this model is limited to target selection and does not explain the victim state's rational behavior in the face of such a threat or attack. We shall extend this model by incorporating into it the dual concepts of endurance capacity and power forgone, which we assume are crucial factors that shape the post-attack choice and behavior of victim states.

CLARIFICATION OF CONCEPTS: ENDURANCE CAPACITY AND POWER FORGONE

Power forgone (PF) refers to the amount of national power a state is willing to lose at a particular time as a result of a terrorist threat or attack (TA) in the process of resisting terrorist demands. When a terrorist organization (TO) makes a demand and carries out an attack on the components of national power (NP) of a victim state, it is assumed that the state loses some degree of its national power, which is PF. The point at which a victim state is no longer able or willing to make more sacrifices on a particular demand or set of demands is its endurance capacity (EC). We assume that PF has a direct proportional relationship with EC. When there is an increase in PF there is also an increase in EC, while NP decreases. Since EC is the breaking point of a victim state's resistance to a TO's demand, we incorporate it in our adjustment of the Eminue-Ufomba model to depict its choice and likely behavior in the face of a TO carrying out an attack.

THE INTERACTIONS BETWEEN VICTIM STATES AND TERRORIST ORGANIZATIONS

Here, we build a game on the interaction between a TO making a demand and a victim state. This game is in three inter-related stages. In stage 1, a TO is either satisfied or dissatisfied with the policy of the victim state (i.e. with the status quo).

If the TO is satisfied, the status quo can be maintained. However, if the TO is dissatisfied, it makes demands on the victim state (VS) using threats. In the face of a threat, the victim state has two choices, to concede or to resist. If the state makes concessions (point 1) to the TO, the latter is automatically satisfied having achieved its aim, and the status quo is altered.[1] If the victim state declines (point 2), the game is extended to the second stage, where the TO is faced with the choice of either making good its threat or not considering that the state, if left alone, will not give in to its demand. In stage 2, with the state resisting the demands of the TO, the terrorists are faced with two choices; to make good their threat by attacking or to abstain from such an action. At this stage, considering the limited resources of the TO, it is expected, on the basis of the theorization of the Eminue-Ufomba model, that a TO will optimize its resources ($\mathfrak{z}$) in such a way that it will only attack a target in the scenario in which its relative impact on the component of the national power of the victim state will be higher than the resources used to carry out such an attack. Hence, if the condition is in line with node 1, where $\int = \mathfrak{z} \leq (\gamma [\alpha\theta, \alpha\beta, \alpha\lambda]) \int\Psi\pi$, the TO is more likely to attack. But if the prevailing condition is in line with node 2 where $\int = \mathfrak{z} \geq (\gamma [\alpha\theta, \alpha\beta, \alpha\lambda]) \int\Psi\pi$, the TO is likely not to make good its threat. The logic behind this assumption is that if the impact of an attack on the victim state's NP is lower than the resources used to call out the attack, a TO is likely to become inefficient or dormant in the long run, considering its limited resources. The linkage between cost-and-benefit and a TO choice will be studied extensively in further research.

If a TO attacks, the outcome (whether the victim state will concede or not) is determined by the victim state's EC. Hence, in the second stage of the game we adjusted the Eminue-Ufumba model by incorporating EC into it. If the impact of the targeted attack on the components of the national power of the victim state is lower than the EC, as the condition is in node 3, there is a likelihood that the victim state will maintain its resistance to the TO's demand,

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1 Status quo here refers to the original position of state before its interaction with the TO. This position can be policy or actions.

and the status quo will be maintained. We represent this mathematically as:

$$\Omega = (\gamma\ [\alpha\theta,\ \alpha\beta,\ \alpha\lambda])\ PF < EC \dots\dots\dots\dots\ 3$$

Where:

Ω = the tendency of a victim state to not concede to terrorist demands as a result of attack on $\int$
A = the relative impact on components of national power
θ = political capacity
β = economic capacity
λ = demography
PF = power forgone
EC = endurance capacity of the victim

But if the impact is higher than EC as the condition is in node 4 there is tendency that the victim state may concede to a TO's demand. In that case, the TO is satisfied while the status quo is altered. Based on this condition we adjust our model to:

$$\partial = (\gamma\ [\alpha\theta,\ \alpha\beta,\ \alpha\lambda])\ PF > EC \dots\dots\dots\dots\ 4$$

∂ = The tendency of a victim state to concede to terrorist demands as a result of attack on $\int$
A = the relative impact on components of national power
θ = political capacity
β = economic capacity
λ = demography
PF = power forgone
EC = endurance capacity of the victim

States are naturally unwilling to make concessions to terrorist demands as a result of threat(s). In fact, previous studies have discovered that victim states usually maintain their non-cooperating stance even after suffering one or a series of attacks from a TO (for example, see: Cronin, 2009; Jones and Libicki, 2008). Accordingly, we can assume that the resistance ability of a victim state depends on three core factors:

1) The degree of impact inflicted by the attack(s) on its core component of national power.
2) The degree of damage on national power a state is willing to endure in its resistance to terrorist threat(s) and actual violence due to a particular issue - power forgone.
3) The limit to which the state is capable of enduring damage(s) to its national power in its effort to resist terrorist demand(s).

These assumptions lay the conceptual foundation for future studies on the subject matter and should facilitate future exploration of the study of terrorism.

CONCLUSION

Using a game-theoretic approach, this article presents the stages of a TO's interaction with the victim state, making assumptions on the factors that shape the choices it makes, why these are made, and their outcome. To achieve this, firstly, we used the Eminue-Ufomba model to show the rational expectation in a TO's choices if its demand is resisted by the victim state. At this point, if the cost of the resources used by the TO to carry out an attack is higher than its relative impact on the core components of the victim state, then our expectation is that the TO is likely not to attack. But, if the cost is lower, it is expected that the TO would make good its threat. If the TO attacks, the victim state has the choice to either resist the TO´s demand or to concede. Here, we built on the Eminue-Ufomba model by incorporating the concept of a state's endurance capacity (EC). We assume that, if the TO chooses to attack and the relative impact on the components of national power of the victim state is higher than the state's EC, then the state is likely to concede to the TO's demand. However, if it is lower, the state will have a tendency to maintain its resistance to the TO´s demand. The assumptions made here lay the foundation for future studies on the subject matter and will provide future exploration of the study of terrorism with a conceptual foundation.

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Recommended citation

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