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Motivating Water Diplomacy: Finding the Situational Incentives to Negotiate

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Abstract. Research attention has been riveted in recent years on identifying the factors that explain or predict the outbreak of violent conflict triggered by environmental change or stress. Much less consideration has been given to understand the factors that orient environmental change situations toward cooperation and the process of negotiation instead. Preliminary analyses and findings are presented that examine the types of environmental, social and economic indicators that presage ripe conditions for negotiating cooperative water resource agreements under circumstances that could easily lead to conflict *or* cooperation. Unexpectedly, the empirical results suggest that *inequality* among riparian states across a wide range of physical, economic and social dimensions sets the stage constructively for the negotiation of international and regional agreements on shared water resources.

Keywords: environmental security, reference values, shared water resources, negotiation, conflict, ripeness, readiness, situational factors

Introduction

Many international negotiations are serious exercises in the allocation and distribution of valued goods. The principal question to be solved is how to divide up the goods so that each party believes that it has been dealt with justly and fairly when all the parties are equal or, if they are not, in accordance with their stature or power standing. However, such distributive negotiations can easily break down. If there are major disparities in power or one party

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feels particularly threatened, cooperation can turn to conflict, and coercion can overpower any attempt at negotiation.

When the goods to be allocated in international negotiations are shared water resources, the stakes and the manner they are dealt with can be complicated. Water sharing inherently contains the seeds for conflict (violent or otherwise) as well as cooperation.[1] Key factors that need to be understood deal with the supply and demand for water, situational change forces, and control mechanisms. The demand for water – how it is used – by the sharing parties can be complementary or in conflict. The supply of water can vary, providing either an abundance or scarcity of quality resource to the sharing parties. Situational factors can also play a key role in altering stakes in the shared water resources. Environmental and developmental changes over time can affect how much of the resource each sharing party requires and they can also change the quality of the resource itself, producing either an abundance or a scarcity. Finally, various control mechanisms can alter the stakes among the sharing parties and can channel conflict. These can include treaties or agreements, legislation, and technology.

Much research attention has been focused over the past 10 years on these factors, but there has been a definite bias toward explaining or predicting the outbreak of violent conflict, tension or instability over shared environmental resources, not cooperative outcomes.[2] In Hauge and Ellingsen (1998), for example, the sole dependent variable measures the extent of domestic armed conflict and civil war. It is not a bipolar variable that taps the broad range of possible outcomes of environmental change – from armed conflict, at one extreme, to negotiated settlement, at the other. In fact, most of this environment-security research has demonstrated that most environmentally triggered disputes do not lead to violent conflict at all.[3] Some yield situations of non-violent tensions and instability, and some lead to cooperative allocation and productive utilization of the resource. But the research question has usually been framed in terms of assessing the conditions that produce conflict.

This article examines the other proposition: environmental change can facilitate negotiated solutions to shared resource usage. The problem is to identify the situational factors that distinguish between conflictual and cooperative pathways. We are looking for the situational/contextual factors that stimulate the stakeholders toward the negotiation process in cases of shared water resources. The article starts by reviewing the environment-security literature to see if it reveals factors that might be useful for the negotiation hypothesis. Preliminary analyses and findings from original research are presented that suggest the situational/contextual factors that presage ripe conditions for negotiating cooperative water resource agreements.

The Conditions for Conflict

Environment and security research has focused on the threats (actual or perceived) to national security from non-traditional sources, in particular, from environmental change. Such change can emanate from scarcity or degradation to the environmental resource. The key research problem in this field is to identify the conditions that can produce conflict or instability as a result of environmental changes (Carius and Lietzmann 1999; Gleditsch 1998). There are some points of agreement among the many studies that have been conducted: the depletion and degradation of renewable resources, population growth, and the unequal distribution of land and income are sources of domestic armed conflict. However, a recently completed cross-sectional statistical study (Hauge and Ellingsen 1998) concludes that while environmental degradation and land degradation are likely to throw countries into civil turmoil (primarily small conflicts), economic and political indicators are far more important as predictors of domestic armed conflict.

Another major research program, the Project on Environment, Population and Security (Homer-Dixon and Percival 1995; Homer-Dixon 1999), suggests that environmental scarcity is rarely the *sole and direct* cause of violent conflict (except in the case of shared river waters where dams or other water-related projects have been known to cause major relocations of people that yield violent conflicts and turmoil). On the basis of many detailed case studies, these researchers conclude that critical environmental problems influence conflict *indirectly* through secondary political-social-economic effects. For example, threats to security may be triggered by environmental scarcities, which, in turn, lead to economic decline, decreased agricultural production or population migration, which, in turn, generate civil strife, insurgencies, and state collapse. The triggering environmental elements and the subsequent effects are often transboundary problems, dealing with shared water, land or atmosphere, and cross-border migration of population groups.

Yet another major study, the Environment and Conflicts Project (ENCOP) (Bächler, Böge, Klötzli, Libiszewski and Spillmann 1996), and subsequent studies by the same team (ECOMAN and ECONILE) (Bächler 1998), link environmental degradation and domestic armed conflict using theories of over- and under-development, consumption, and modernization. Their research findings relate environmental degradation to instabilities in other domains and suggest that manifest conflicts are situationally determined. Population migration, decreased food supply, health problems and poverty can all result from environmental change and degradation. These problems, in turn, can generate broader situations of environmental dependence and environmental discrimination, which can create the atmosphere for conflict. Some countries possess control mechanisms that can reduce their vulner-

abilities to such environmentally induced threats; these controls include public participation in the decision-making process, strong and stable governments, and strong institutional and technological capacity. On the other hand, those countries that have weak economic performance, social inequality and discrimination, and high population growth and density are more prone to succumbing to serious conflict under these conditions.

To understand the implications of environmental change requires that they be characterized in such a way as to differentiate their effects in context, be they positive, neutral or negative. Merely describing patterns of environmental change is not enough; it must be possible to distinguish how that change interacts with situational factors and produces either beneficial or harmful outcomes. Many contextual factors serve as sensitive filters that moderate the impact of environmental changes (Lietzmann and Vest 1999). They include: perceptions of threat, economic vulnerability and resource dependency, institutional, socio-economic and technological capacity, cultural and ethno-political factors, violence potential and internal security structures, political stability, public participation, international interaction, and existing mechanisms for conflict resolution. While emphasizing the critical explanatory nature of situational factors, the Lietzmann and Vest study also acknowledges that it is often difficult to distinguish the role played by any one situational indicator because many interact with each other. Thus, it is difficult, except through statistical analysis, to isolate the moderating effects of particular factors.[4]

A key to distinguishing between environmental changes that lead to conflict and those that lead to cooperation is the concept of *reference values*. Reference values identify the thresholds at which changes over time in environmental indicators are transformed from being beneficial or neutral to being negative, costly, unsafe or risk-provoking along some dimension (World Bank 1995). They are popularly thought of as benchmarks, standards, or rules of thumb that clearly differentiate when an indicator that is being monitored has changed in a major, step-level fashion. In so doing, reference values help to characterize the very nature of an environmental trend. If it is possible to identify reference values for each major indicator of environmental change, then useful information may emerge that can predict likely security problems, instability or conflicts.

Reference values establish a foundation against which to judge the meaning of changes in environmental trends (Hammond et al. 1995). They help to assign policy significance to indicators and help in the knowledgeable interpretation of change. They assign meaning to increases or decreases in environmental indicators, thus offering the ability to analyze such trends against policy goals and make meaningful comparisons over time and across

regions or countries. Overall, the reference value characterizes an environmental trend, provides it with policy relevance and meaning, and points to the consequences of beneficial or detrimental changes in the trend. These consequences can be viewed in terms of worsening environmental problems that, in and of themselves, present a threat, that generate the conditions for increased threat, or that influence other contextual factors, which in combination may trigger a larger security or instability problem (Tunstall, Hammond and Henninger 1994).

An example can be given of a reference value for water. Reviewing a wide range of scientific studies that assessed the minimum water requirements for human and ecological functions, Gleick (1996) concludes that, on average, basic needs (for drinking water, water for human hygiene, water for sanitation services, and water for household needs to prepare food) can be met at 50 liters per person per day. (This finding is contingent on country climate and the population's distance from the water source.) If a country falls above that threshold, its population is sustainable; if a country falls below that threshold, the author predicts that "large-scale human misery and suffering will continue and grow in the future, contributing to the risk of social and military conflict" (p. 83). Using this benchmark with 1990 data, Gleick found that 55 countries fell below the reference point.[5]

Figure 1 illustrates research conducted as a simple empirical test of reference value indicators of water security under a NATO-sponsored study.[6] This model hypothesizes that situational factors play a major role in moderating the effects of changing levels of fresh water availability (represented by reference value indicators) on economic and social instability. Situational indicators are viewed as critical controlling factors that either exacerbate or reduce the impact of the environmental indicators on instability. The model also suggests that instability levels feed back in this system to affect increased or diminished security. A data base covering 160 countries was created with data collected from the World Development Indicators (World Bank 1998), the Pacific Institute and Stockholm Environment Institute's "Water in Crisis" Project (Gleick 1993), and the University of Göttingen and Transparency International's Corruption Perception Index (http://www.transparency.de). The water variables in Figure 1 represent indicators that capture critical aspects of the water security problem – access to safe water and sufficient quantities of available fresh water.

As anticipated, when the situational factors are not taken into account statistically, only a few correlations are revealed between the water security and instability indicators.[7] Increased access to drinking water covaries with an increase in economic stability (r = 0.257) and lowered corruption levels (r = 0.446). As well, increased access to sanitation services covaries with

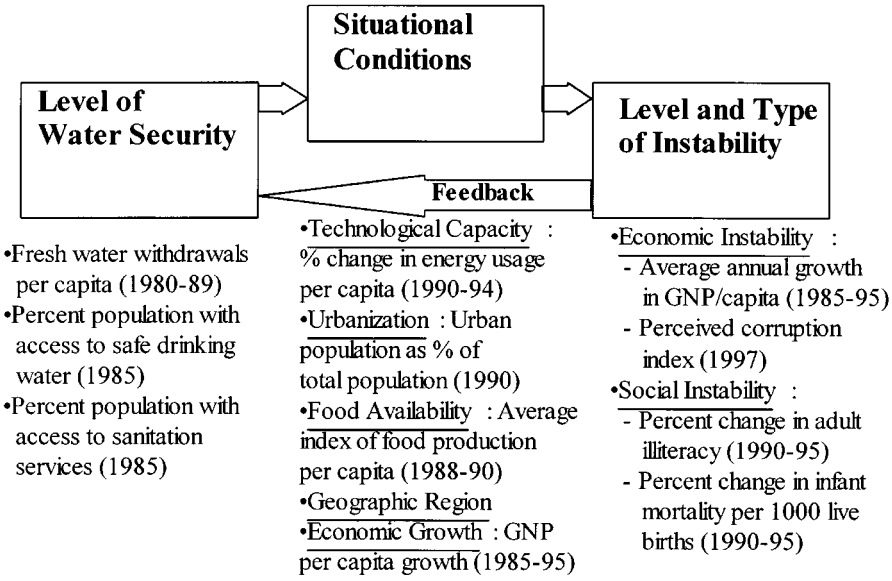

Figure 1. Testing the effects on economic and social instability of changes in fresh water security.

lowered corruption (r = 0.693). However, when the correlation matrix is controlled for various contextual factors – technological capacity, urbanization, food availability, economic growth, and geographic region – many more significant relationships appear between water security and instability indicators. The situational variables are shown empirically to be critical in explaining the relationship between safe water availability and potential conflict. Moreover, the water security indicators selected for this test appear to be viable reference indicators demonstrating meaningful changes in environmental trends.

Another situational analysis conducted by the author compares seven shared water basin cases. Table 1 presents the results of two of these cases. Analysts usually view the Zambezi River basin case as an example of preemptive cooperation, where there was no immediate security threat. On the other hand, they view the Indus River case as an example of a security threat that only reaches non-violent levels. The differences between these two cases can be traced to situational factors. Comparative data were gathered on seven factors: the intensity of environmental stress, the number of stakeholders, the perceived severity of environmental stresses, the stakes and interests of each involved group, the political willingness to resolve the stress, the existence of cooperative mechanisms to resolve the situation, and exogenous factors that might trigger a problem. Reviewing all of the cases in the “no threat”

Table 1. Situational profile of violent and non-violent outcomes

	ZAMBEZI No security threat	INDUS Non-violent security threat
Situation profile		
Environmental change problem?	Future development projects and degradation of water supply	India cut off water to downstream Pakistani canals for one month in 1948
Stakeholders?	Malawi, Zimbabwe and Zambia, Mozambique (greatest % of population); plus Tanzania, Angola, Botswana and Namibia	India and Pakistan
Perceived severity of environmental change?	Not severe now; threat is in distant future	Severe for Pakistan
Perceived stakes?	Each uses river for irrigation, power and drinking water. Objections from downstream countries about dams and power projects; ethnic groups and NGOs about environment	Pakistan – needs water for irrigation India – demonstrate sovereignty, pressure Pakistan on Kashmir, retaliate against Pakistani export duty on raw jute
Political willingness?	Joint interest in limiting South African dominance; interest in UNEP and other donor funding	With good offices of World Bank
Existing cooperative mechanisms?	Cooperative ZACPLAN Regime created within existing SADCC	Three successive agreements signed, finally over 13 years based on principle of separate usage rather than sharing
Implications drawn from this profile		
Hostile actions?	No	Yes, by one of the parties
Attempt to dominate?	No	Yes
Cooperation?	Perceived benefits from cooperation	Perceived threats to interests

category, it was found that they were characterized by no hostile actions, no attempt by any of the parties to dominate the other, and perceived cooperation benefits from truly sharing water resources. The cases in the "non-violent security threat" space, on the other hand, demonstrated some hostility early on, attempted dominance by one of the stakeholders, and clear perceptions of a threat to national interests. Finally, the cases in the "violent security threat" space had a longer history of deeply rooted animosity among the stakeholders, perceptions of severe encroachment on national interests, and resistance to dialogue among the parties.

Situational factors moderate the impact of environmental changes, and how and if those changes produce instability and violent conflict. Many environmental changes also contain inherent opportunities for cooperation. In some cases, these changes can only be managed effectively if all the effected parties cooperate. In other cases, environmental changes offer new options and incentives where all effected parties can benefit if they decide to work together. What are the conditions that motivate conflictual versus cooperative consequences?

The Conditions for Negotiation and Cooperation

The existence of shared environmental resources can and often does yield cooperation. But the conditions that facilitate cooperation, often through the mechanism of negotiation, have not received as much research attention as the conflict side of the equation. The general negotiation literature does identify some of the essential prerequisites for negotiation. Kremenyuk (1991) elaborated on situational factors as one of the principal building blocks in understanding the negotiation process. Stein (1989) assessed the triggers of pre-negotiation – the early catalysts that stimulate parties to get to the table in the first place. By examining several case studies, Stein identified turning points in crises and attempts to manage or avoid crises as the primary factors that incentivize negotiation. For Zartman (1989), countries do not negotiate unless they perceive that a conflict is ripe for resolution. Ripeness usually results from a situation that is viewed as a mutually hurting stalemate by all sides, augmented by an impending catastrophe, with a perceived way out – through negotiation. Spector (1998) and Pruitt (1997) specified negotiation *readiness* as a further elaboration of the concept of ripeness. It proposes that negotiators have to have sufficient *capacity*, in addition to the perception that a conflict is ripe for resolution, to truly be ready to negotiate an agreement. Negotiators need to have the resources, training and experience to negotiate on a close-to-equal basis with each other; sometimes that requires a "reengineering" of the situation to develop a context that is conducive to negotiation. Druckman (1995, 1997) conducted several empirical studies that compared cases of international negotiation in terms of their similarities and differences on issues, structure, process, situation and outcomes. His findings emphasized the importance of situational influences and levers, such as media attention, the number of negotiating parties, firm deadlines, and third party involvement, on facilitating flexibility in the negotiation process and yielding more successful outcomes.

In water resource sharing situations that contain both the seeds for conflict and cooperation, situational or contextual influences play a critical role. It is hypothesized that the situational factors that point to joint utilization of the water resource are likely to push the parties toward negotiated agreement.

An analysis of 75 river basins shared by two or more countries (identified in Gleick, 1993) was conducted by the author to identify some of the salient situational factors that appear to facilitate the development of negotiated agreements among riparians.[8] Data were gathered from several sources (Gleick 1993; World Bank 1999; United Nations Treaty Series; UNDP 1999) on such indicators as river basin size, number of riparians, percent shared area, the adequacy of national water legislation, extent of industrial usage of national water resources, percent of population with access to safe water,

GNP per capita, the human development index, and the existence of a negotiated treaty or agreement governing the river basin. Of the 75 cases in the data base, 26 were found to have extant negotiated agreements governing the use and management of the shared water resource. 58 percent of these agreements were developed in basins that have three or more riparians; 42 percent have only 2 riparians. Negotiated agreements appear to be more likely when larger numbers of stakeholders are involved.

There are particular situational attributes that distinguish clearly between those shared river basins that have achieved negotiated agreements from those that have not. The results in Table 2 show that:

- Smaller shared river basins (in terms of geographic area) tend to reach agreement more often.
- The greater the inequality among the riparians in terms of the amount of geographic area of the basin occupied (that is, when there is a large difference among the riparians in their share of the geographic area), the more likely there will be an agreement.
- The larger the difference in usage of the water resource for industrial purposes among the riparians, the more likely an agreement.
- The higher the industrial usage of the water resource by the riparians, the greater the likelihood of agreement.
- The greater the difference among riparians of access to safe water, the more likely an agreement.
- The greater the difference in economic wealth among the riparians, the more likely an agreement.
- The greater the difference among riparians in their human development index level, the more likely an agreement.

What then are the situational requisites for negotiated agreement in shared river basins? Interestingly, one of the common features is *inequality* among the riparians – inequality among the riparians in their physical share of the basin, their access to safe water, their industrial usage of water, their economic wealth, and their human development (their economic, social and political well-being). The research literature on negotiation usually suggests that sustainable negotiated agreements are facilitated by relative equality among the parties, where one does not exercise excessive or coercive power over the others (Pfetsch and Landau 2000). Inequality in power or history can result in a breakdown of negotiations, and if agreements are reached they may be perceived as imposed, unfair, and therefore unstable, solutions. In the case of shared river basin agreements, the unequal conditions appear to be the precursor of agreement, what would *not* be anticipated from the general negotiation research literature.

Table 2. Comparison of situational factors for shared river basins with and without agreements

Situational indicators	Shared basins with no treaty	Shared basins with treaty
Number of major shared river basins	49	26
Average basin size (in square km)	752,517	624,787
Average difference in percent of basin area occupied by top two riparians (%)	29.4	46.0
Average difference in percent of water withdrawals for industrial purposes by top two riparians (%)	9.5	17.7
Average total by top two riparians of percent of water withdrawals for industrial purposes (%)	27.6	67.3
Average difference in percent of population with access to safe water between top two riparians (1996) (%)	8.5	19.4
Average difference in GNP per capita in US dollars between top two riparians (1997)	$3,322	$9,320
Average difference in human development index between top two riparians (1997)	0.509	0.829

Are these agreements inherently unstable, or are they a special case given the inextricable link among riparians to their valuable water resource? Perhaps it is the more powerful parties among the riparians that dictate a sharing agreement and push it toward mutual acceptance. The more powerful parties might see that they will reap benefits from cooperation with the weaker parties. Moreover, they may have the resources that enable them to put forth and sustain a position that promotes compromise. Without the power differential, there might be no party willing to forge a compromise solution or have the capacity to promote it without losing face. These are only preliminary findings and more research needs to be conducted.

Perhaps it is the case that broad inequalities based on geography, environment and the economy force countries to cooperate politically and, thereby, reach negotiated agreements. The unequal resource base may put extensive hydroelectric power in one country, but a technically skilled population in the adjacent country. Sherif's concept of superordinate goals (1967) may be at play here. The effective use of shared water may only be possible if the unequal, and otherwise, conflicting parties work together cooperatively, rather than if one side grabs all that it wants. Even the more powerful may need what the weaker has to use the resource meaningfully.

Discussion

The sharing of any valuable resource among sovereign nations presents a potential problem. Are the parties motivated to grab as much of the resource as possible for their own use, potentially resulting in conflict, or are the parties motivated to find some channel by which they can share the resource for the common good while managing their differences peacefully? What encourages conflict or negotiation when the stakes involve access to a precious resource, such as fresh water? Conceptually, it is almost trite to say that outcomes are dependent upon certain conditions. But, in the field of water diplomacy, we are still seeking informed insights through research and model building about the particular conditions that are likely to lead to conflict and those that may yield negotiated solutions. The endeavor will certainly require a broader analysis than presented in this article to test the large number of relevant situational factors that might have an impact.

The results of our small empirical tests suggest strongly that the motive toward conflict or negotiation is situationally driven. The same stimulus or trigger can lead to either conflict or negotiation; the decision hinges on facilitating elements in the context. The availability of technological capacity to handle environmental problems, for example, can turn a potentially conflictual situation into a more stable one. Food scarcity in a population that is also threatened with limitations to its water supply may make it more prone to conflict. On the other hand, the situational factors that facilitated negotiated agreements in our empirical test suggest that in the inequality among riparians, the seeds for cooperation may be found. Additional and alternative hypotheses need to be developed to generate a richer model.

Identifying and tracking reliable reference values of particular shared water resource variables might also provide practical indication of how situational factors motivate negotiation and cooperation. Analysts and practitioners alike need to know not only the important situational factors at work in a potential conflict case, but how these situational factors may affect the water resource, for the better or worse. It is not how situation interacts with the politics of conflict or cooperation directly, but how it affects the natural resource itself that is relevant.

The situation can be conceived as having two dimensions. The first, as presented in the empirical test, is assigned to the external environment – the resource, and the social, economic and political context. The second is the internal environment, the conditions under which the negotiation operates – the venue, power differentials, publicity, deadlines, etc. It is important to consider how both types impact upon, motivate or provide disincentives for seeking cooperation.

A larger question is whether these situational drivers toward conflict or negotiation are givens or can be adjusted and managed. Is it possible to "engineer" a situation to facilitate and motivate the likelihood of negotiations and agreements? Certain factors are immutable; the share of a river basin occupied by each riparian is unchangeable. But other important factors – the extent of industrial use of the river's water, water withdrawals for other purposes, and the adequacy of national water legislation, for example – are changeable and can be managed by riparians to make the situation more amenable to negotiation and agreement. Conscious situational engineering as a matter of national or regional water policy needs to be examined as a possible conditional stimulus of negotiated agreements to ward off potential conflict.

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Notes

1. On a practical level, international donor organizations have sponsored intervention programs to control or manage conflict when it arises over shared water resources, for example, United States Agency for International Development's (USAID) FORWARD project in the Middle East, as well as their Irrigation Support Project for Asia and the Near East (Bingham, Wolf and Wohlgenant, 1994).
2. Some exceptions to this include the work of Evan Vlachos, "Hydrodiplomacy and Dispute Resolution in Water Resources Conflicts," In Jacques Ganolis et al. (eds.), *Transboundary Water Management: Institutional and Engineering Approaches*. Berlin: Springer, 1991, pp. 19–36. He examines the opportunities in water resource management and planning for resolving conflicts between countries that share water resources. Also, Ken Conca (University of Maryland) is currently directing a study involving an international network of scholars that is examining how environmental cooperation can promote regional peacemaking.
3. See Lietzmann and Vest (1999) for a comprehensive review of this research literature and the special issue of the *Journal of Peace Research* on environmental conflict (Vol. 35, no. 3, 1998) which includes major critiques of this body of research. The Woodrow Wilson Center's Environmental Change and Security Project (1999) focuses primarily on the conflictual nature of environmental change.

4. Several modeling projects are currently seeking to understand this complexity among situational variables, including an early warning model called FAST (see John Davies and Ted Gurr, editors (1998) *Preventive Measures: Building Risk Assessment and Crisis Early Warning Systems*. New York: Rowman and Littlefield).
5. When using reference values, one must take into account the adaptability of societies to environmental change. Many examples demonstrate that even social groups with very limited technological capacity can adapt quickly to resource scarcities, making the reference value only a rough benchmark for understanding the implications of environmental changes.
6. This analysis and the one described in Table 2 were conducted by the author within the NATO-sponsored project on "Environment and Security in an International Context." The author gratefully acknowledges the support of the US Department of Defense in conducting the research. However, the findings and views resulting from the study are those of the author and do not necessarily represent the views of the US Government.
7. All of the Pearson correlation coefficients are statistically significant at $p \leq 0.05$.
8. The empirical research described in this section was supported by the Jacob and Hilda Blaustein Foundation through a grant to the Conflict Management Program at the Johns Hopkins University.

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