



## Research Report

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Population Responses

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## **A Micro-Level Approach to Investigating Armed Conflict and Population Responses**

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**ABSTRACT**

This article develops and tests a new micro-level approach to the study of armed conflict and responsive behaviors in the general population. This approach includes decomposing a conflict into a series of discrete political and violent events, examination of the different dimensions of these events and how they can create different mechanisms that link to behavioral outcomes, examination of differential risks to each type of event within the population, and careful consideration of the specific context within which the conflict occurs. In this article, we focus on the two mechanisms of instability and threat of harm and how they separately affect marriage, contraception, and migration. We empirically test this approach in the context of the recent decade long conflict in Nepal using a unique combination of records of conflict events and a longitudinal study of individual data and the communities. Results show that discrete conflict events affected marriage, contraception, and migration behaviors. Furthermore, we show that the same conflict events had opposing consequences across these different demographic processes and that different conflict events had opposing consequences on the same demographic process. This demonstrates that the decomposition of armed conflict into specific events, examination of the exact mechanisms through which they affect behavior, and consideration of differential risk to each type of event yields a significant advance in the scientific understanding of armed conflict. In conclusion we suggest further avenues for future research to use and improve this micro-level approach to conflict studies.

## **INTRODUCTION**

Awareness of armed conflict worldwide is high in the public, among policy makers, and in the research community. Not only do violent events have immediate consequences for physical wellbeing among those directly exposed to conflict, but the longer term consequences such as adverse mental health, large migration flows, spread of infectious diseases, disrupted markets and economic instability can have implications for the lives of those far removed from the events themselves. As a result, the awareness and attention armed conflicts receive will remain high and the engagement of the scientific community in these issues will be necessary to understand and mitigate the consequences for the global population. The social sciences will receive great attention in the widespread effort to improve our understanding of both armed conflicts themselves and the social consequences of those events. In an effort to contribute to social science approaches to the study of conflict, in this article we advocate a micro-level approach that includes attention to detailed records of the process of armed conflict, careful analysis of the multiple dimensions of discrete events that comprise a conflict, and incorporation of these discrete events in quantitative analysis of demographic behaviors at the individual level.

Macro-level perspectives on armed conflict receive relatively more attention in social research than micro-level perspectives. The study of macro-level institutions, including the parties in conflicts and their motivations, strategies, and interactions have been widely addressed in the literature and provide insights on the conditions that lead to armed conflict, individual participation in conflict and violence, and strategies for peacekeeping and peace-building once conflicts have started (Brinkerhoff 2005; Caplan 2005; Kumar 1997). Careful definition of types of macro-level violence, including war, civil war, genocide, politicide and terrorism has also received attention (Martin, McCarthy, and McPhail 2009). Micro-level perspectives on conflict are much less common. A recent significant article reviews the current social science of micro-level psychological and behavioral responses to conflict (Spilerman and Stecklov 2009). However, work on the micro-level conceptualization and measurement of conflict itself is rare (Verwimp, Justino and Brück 2009). As a modest step toward enhancing the social scientific tools for investigating the consequences of conflict, this paper draws upon concepts and approaches from social demography to advance a new micro-level approach to the conceptualization, definition, and measurement of armed conflict and its consequences.

As now common in social demography, we propose a strategy that treats macro-level changes such as armed conflict as something that can be decomposed into a series of micro-level discrete events. This approach yields a number of important advances in the study of armed conflict. First, once a macro-level conflict is disaggregated into a series of discrete events it becomes clear that no two events in the series are exactly the same, that these events take place over time, and that the timing and sequencing of these events are relevant to understanding their consequences. Second, the discrete events that comprise a conflict vary across specific dimensions that produce variability in the meaning of these events to people living near them. Identification of these dimensions of meaning across which events cluster is essential to predicting their consequences. Third, because violent events vary across dimensions with different meaning to the people who experience them, the individual and family consequences of each specific type of event will be different. Thus this disaggregation of armed conflict into specific events, sorting of events in clusters of types, and investigation of the timing and sequencing of specific events, yields a significant advance in the scientific understanding of armed conflict.

As with most social demography, conceptual advances are rarely meaningful without substantial empirical measurement. The study of armed conflict is no different and the lack of empirical measurement of conflicts – especially measurement that documents specific violent events and links this to measures of individual and family behaviors before, during, and after such events – has been a major obstacle to conceptual advance. The conceptual advance we propose here is grounded in detailed empirical study of the recent armed conflict in Nepal. Detailed ethnography among those exposed to the conflict provides the key grounding for sorting specific conflict events into categories. Detailed records of specific violent and political events throughout the course of the conflict provide the means to evaluate this conceptualization. This empirical record is directly linked to an ongoing panel study of individual and family behaviors in rural Nepal that features monthly measurement. Together, these empirical tools provide the opportunity to demonstrate the value of the conceptual advance of disaggregating armed conflict into the specific events that make up that conflict. The result is an unprecedented empirical window into the micro-dynamics of armed conflict.

## **MICRO-LEVEL APPROACH TO INVESTIGATING ARMED CONFLICT**

Our approach to investigation of the consequences of armed conflict disaggregates conflict into the dozens of individual events that comprise the conflict. Then we consider variations in the impact of these events on civilian lives and use context specific information to derive predictions of the likely consequences of events. Finally we link those consequences to three specific demographic behaviors, marriage, contraception to avoid childbearing, and international migration. We begin by differentiating among types of conflict-related events and two different but important mechanisms of change – instability and violent threats that motivate avoidance of harm.

### **Multiple Events**

The first fundamental building block of our conceptualization of armed conflict is the idea that an overarching conflict is actually composed of many different specific events. This includes multiple violent events, such as killings, beatings, gun battles, bombings, or abductions. A time of armed conflict is also often characterized by political events that together comprise the conflict, including events like large scale protests, government transitions, states of emergency, or ceasefires. Of course the specific events will vary across specific settings or conflicts. But it is essential to recognize that in any setting or conflict, multiple events are likely. The occurrence of multiple different events allows the meaning of events to vary, so that different events may be associated with different mechanisms linking them to individual behavior, producing variations in the consequences of these different events.

The most obvious and commonly considered mechanism linking violent events to behavior is the threat of harm and the actual experience of harm. Most studies of armed conflict identify this threat of harm as the primary motivation for behavioral responses to violent events, as individuals seek to avoid harm. Certainly violent events such as killings, beatings, gun battles, bombings, or abductions that actually cause some individuals harm are likely to raise the overall threat of harm for all people in the local area. As such these events are likely to motivate individuals to behave in ways they believe will help them avoid harm. Of course there may be some variation across these events and that variation is likely to be setting and conflict specific. For example, in the recent armed conflict in Nepal, the bombs used were small and produced

damage on a relatively small scale, whereas gun battles were longer in time and most often resulted in high fatality counts.

Political events that are not overtly violent may also increase the threat of harm, but this effect is likely to be weaker than the case of overtly violent events. Protests and government transitions may increase the threat of harm to some, particularly those who are directly involved with the event. However, because they do not always cause actual physical harm and when they do, it is often only a select group of people who are affected, they are not as likely to raise the threat of harm for the general population as violent events such as gun battles and bombings. Ceasefire events are particularly interesting with respect to the threat of harm. As official agreements to cease hostilities, they fundamentally reduce the threat of harm quickly. As a result, ceasefires are likely to produce effects opposite to those of violent events that increase the threat of harm.

Another important mechanism likely to affect behavioral response is instability that reduces the individual's ability to predict circumstances in the future and creates a sense of chaos or anomy. Political events such as large scale protests, government transitions and states of emergency are likely to be much more closely associated with this mechanism than with the threat of harm. This outcome of some events is likely to have an independent influence on individual behaviors because it reduces the ability to judge the threat of harm and other relevant factors, such as the costs and benefits of specific behaviors. In a recent series of in-depth interviews in the Chitwan Valley of Nepal (the setting of the empirical analysis in this paper) one respondent stated, "The situation was uncertain. I was confused about what I could do to earn a living. I couldn't decide exactly what was to be done, where I could go, and so on." Another described more specific results of instability, "Farmers had difficulties farming. Even ploughing tractors weren't available [to rent]. The road was blocked and it created difficulties to go to the market for shopping. Even if we wanted to run shops, there were closed frequently... when there were closures, they [children] couldn't go to school. Everyone had to face such problems." Inability to judge the costs and benefits of specific behavior may make behavioral response more unpredictable, but it also may produce systematic response. Specifically, in a context of macro-level instability, individuals may adopt behaviors that increase stability in their personal lives or delay behaviors that decrease personal instability.

Once again, all armed conflict events may produce instability, with the level of instability varying across events, settings, and conflicts. Violent events such as gun battles or bombings produce instability, but the extent of that consequence is likely to be less than the instability produced by large scale protests or government transitions that threaten the basic functioning of government, law, and the existing order. As with the threat of conflict, ceasefires are likely to produce the opposite effect, increasing stability quickly. All the events that compose an armed conflict could be evaluated for the level of instability they may produce, including events not mentioned here. But the evaluation of both the level of instability and the behavioral consequences of that instability will depend on the specific setting and conflict being studied.

The threat of harm and instability are only two mechanisms likely to connect the events of an armed conflict to individual behaviors. Though these two mechanisms are likely to be associated with most armed conflicts, other mechanisms may also be at play. Our aim here is not a comprehensive consideration of all possible mechanisms. Instead our more modest goal is to advance the ideas that: 1) more than one mechanism may be at work; 2) the specific events that comprise an armed conflict are likely to vary with respect to each mechanism; and 3) some events may have opposite effects on a specific mechanism.

## **Differential Risk**

The second piece of our conceptualization is acknowledgement that individuals face variations in risks and perceive harm and instability differently depending on their individual, family, and community circumstances. Again, this variability is likely to depend on setting and conflict. For example, during the recent conflict in Nepal rich people were targeted by the Maoists and were thus at higher risk of abduction and assassination. Alternately, poorer people were targeted by the government forces for supposed collusion with the Maoists, and were thus at higher risk of house raids, beatings, and incarceration. As a result, each abduction and assassination likely raised the level of threat and affected the rich more than the poor, while house raids and beatings likely affected the poor more than the rich.

In-depth interviews in the study area show that the population of Chitwan generally knew what types of people were at risk for certain targeted events and used this to calculate their own risk and make behavior choices. The following statement was common amongst interview respondents, “There was hearsay that different people were targeted. Actually, there was nobody

in the village who was educated or involved in politics. Most of them were killed. However we weren't associated. We were simple. We were not negative against anyone.”

Many other statuses and circumstances may also shape risk. Family relationships and circumstances are particularly likely to drive perceptions of level of threat and instability. In another example from Nepal, the unmarried were targeted by both sides of the conflict for conscription into arms. As a result the unmarried were likely motivated to marry or flee. At the same time, the married in Nepal are significantly more likely to have children, homes, and other property, which may raise their perception of threat of harm relative to single people. As a common concern in our in-depth interviews, one mother reported fears about her son being conscripted, but none for herself. “They were taking young men from every household. One was taken from that house [pointing to neighboring house]. I thought if the process continued then one day they would ask my son to join their team. If he rejected, they would have hurt him. Later, he got a visa to a foreign country and went abroad. We were satisfied only after that.”

Again, virtually every dimension of an individual's experience and circumstance may affect his or her perceptions of threat of harm and instability. Gender, race, and ethnicity are strong candidates in most conflicts, but there are many others. Our modest objective is to recognize this variability in our conceptualization, not to provide a comprehensive listing of all such factors. Further we advocate for analysis of conflict at the micro-level, so that individual characteristics and circumstances can be taken into account.

## **CONTEXT AND SETTING**

Though we argue this conceptualization is valuable for the study of armed conflict across a wide range of settings, we also argue specific behavior predictions should be constructed with reference to a specific setting. Following a practice now common in social demography (Axinn and Yabiku 2001; Caldwell, Reddy and Caldwell 1983; Massey et al. 1987; Massey and Espinosa 1997; Thornton and Lin 1994; Xie and Hannum 1996), we argue each application of the approach should be tailored to the specific context being investigated. These context specific predictions must be grounded in information about the starting state of the behavior in question, local meanings associated with each event, and localized constraints and opportunities for behavioral response.

The context of this study is the recent decade-long armed conflict (1996-2006) between the Communist Party of Nepal (Maoist) and the government security forces in Nepal. Our empirical analyses are based in the western part of the Chitwan Valley of south-central Nepal. The conflict and geographic area provide an ideal case example to describe conceptualizations, conduct, and responses to conflict for two reasons. First, the generally poor living conditions of the population and moderately intense violence in Nepal make this case study comparable to many of the on-going, moderately intense, intrastate conflicts around the world today. Though not exceptional, intrastate conflicts to which Nepal's compares together comprise about 90% of recent armed conflicts (Mack 2002). Together these conflicts affect about 20% of the world's population (Mack 2006).

Second, the western part of the Chitwan Valley of Nepal is the location of the Chitwan Valley Family Study (CVFS), a detailed, prospective data set of individual lives and behaviors. This study is unique in that it covers the period of time from three years before the insurrection began, through the six years of the violence. The CVFS, combined with detailed records of individual violent and political events offer an unprecedented opportunity to investigate the conduct of conflict and consequent individual demographic behaviors.

## **Armed Conflict in Nepal**

The conflict began in February 1996 when the Communist Party of Nepal (Maoist) made a formal declaration of "People's War" with the intention to unseat the constitutional monarchy and install a democratic republic. They charged the government with poor administration, corruption, unfair taxation, and neglect of poor rural areas of the country.

The early stages of the conflict were contained primarily in several mid-western districts and involved damage to government installations and communication infrastructure, capturing weapons, and threatening government security forces. From mid-2000, however, the Maoists progressively expanded their campaign nationwide. From their core base in the mid-west, they initiated campaigns of ideological and military recruitment and began violent activities across rural areas of most of the country. In January 2001, the Nepalese government responded by creating a special armed police force to fight the Maoists. After that, the government generally maintained control of cities and large towns, and the Maoists controlled a majority of the rugged countryside of Nepal. In many areas the situation was particularly confusing, with the

government maintaining a presence during the day and the Maoists maintaining a presence in the same area at night. By 2001, the Maoists were operating in 68 of Nepal's 75 administrative districts.<sup>1</sup>

Because this conflict was staged mainly as a guerrilla war, there was generally no 'frontline'. It was largely unknown where fighting would break out and civilians were often unintentionally caught up in violence. For example, respondents in our in-depth interviews consistently reported statements such as, "The people were really terrorized. It was insecure even to go to town to purchase things. It was difficult to send children to school," and, "It was difficult to go anywhere... You never knew if a person who went outside would come back or not. The situation was very dangerous."

Reported violent acts by the Maoists and Nepalese government security forces against civilians include torture, extra-judicial killings (both discriminate and indiscriminate), bombings, gun fights, abductions, forced conscription, billeting, taxing, and general strikes<sup>2</sup> (Hutt 2004; Pettigrew 2004). From 2000 until the end of 2006, the Maoists were responsible for a total of 4312 deaths and the government forces were responsible for 7544 deaths (Informal Sector Service Center 2006).

A variety of important political events also characterized this conflict. The Prime Minister was deposed or resigned six times between 2000 and 2006. In 2002, Parliament was dissolved and the King took up executive powers. In 2004 the Maoists blockaded Kathmandu for one week, causing major unrest and disruptions in almost all people and goods moving into or out of the capital. Following this clear threat by the Maoists on the capital, in early 2005 the King assumed direct rule of the country. A timeline of these and other significant political events is presented in Table 1.

In June 2001, almost the entire royal family was assassinated in the palace in Kathmandu, causing shock and unrest throughout the country. Rumors spread quickly about who was responsible for this crime. However, despite official inquiries the matter was never resolved and

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<sup>1</sup> This data is available on the South Asia Terrorism Portal website, "Nepal Terrorist Groups- Communist Party of Nepal- Maoist" at <http://www.satp.org/satporgtp/countries/nepal/terroristoutfits/index.html>. Retrieved September 11, 2008.

<sup>2</sup> Reports of these events are posted on the South Asia Terrorism Portal site, "Major Incidents of Terrorist Violence in Nepal, 1999-2006": <http://www.satp.org/satporgtp/countries/nepal/database/majorincidents.htm> Retrieved September 11, 2008.

no one has been blamed or indicted to date. Although the Maoists were likely not responsible for the assassination of the royal family, this incident and the lack of resolution only exacerbated the building sense of insecurity and chaos at the time.

Amongst other significant political events, the government called a nationwide State of Emergency and instituted martial law twice, between November 2001 and August 2002 and again between February and April 2005. These periods were marked by suspension of rights such as freedom of movement and freedom of assembly, political and human rights leaders and journalists were arbitrarily detained and arrested, and communication links within the country and the outside world were severely curtailed (International Federation of Journalists 2005).

There were three ceasefires during the entire conflict period, the first lasted from July to November 2001, the second from January to August 2003, and the third from September 2005 to January 2006. The first several months of each ceasefire were characterized by peace, as agreed by both belligerent parties. However, the last month or two of each ceasefire witnessed progressive breakdowns in peace talks and renewed and often intense fighting leading to the ultimate collapse of ceasefire agreements.

There were also multiple large nationwide strikes and protests. These events were often centered in Kathmandu, but strikes extended nationwide. Strikes were most often called by the Maoist party and other legal political parties, generally involved closing transportation systems, and brought the country to a standstill for periods of one to five days. Protests were usually initiated by the legal political parties, lasted from a few days to about four weeks, and were sustained by widespread civilian participation. Every year since the 1996 declaration of the “People’s War”, the second week of February was marked as the anniversary of this declaration by the Maoists with strikes and mass rallies around the country. Notably, most of these events were planned and publicized beforehand and were reported in national Nepali and English language newspapers. Strikes and protests severely affected the day-to-day life of the general population and spread considerable unrest, insecurity, and fear among the populace nationwide.

The conflict functionally ended in June 2006 when serious peace talks were commenced. On November 21, 2006 the government and Maoists signed a comprehensive peace agreement declaring an end to the conflict.

## Armed Conflict in the Chitwan Valley

Our study is based in the western part of the Chitwan Valley, in the Chitwan District of south-central Nepal. Nestled in the Himalayan foothills at approximately 450 feet above sea level, the administrative district of Chitwan borders India and is about 100 miles from Kathmandu. There is one large city, Narayanghat, and the rest of Chitwan's population, like much of Nepal, lives in small, rural villages. This flat and fertile valley is dominated by agriculture; 82% of households in the study area of the Chitwan Valley Family Study are involved in farming or animal husbandry and operate on a subsistence level.

Chitwan was moderately affected by the conflict. For example, between 1996 and April 2006, Chitwan experienced 194 conflict related fatalities (Informal Sector Service Center 2006), which is slightly higher than the average number of fatalities of all districts, but lower than the most-affected western districts that experienced up to 950 deaths throughout this same time period (Informal Sector Service Center 2006).

Violent disturbances in Chitwan occurred relatively routinely. Considering the larger 'local' area that could affect individuals' perceptions of threat, comprised of Chitwan and the six surrounding districts (Nawalparasi, Tanahu, Gorkha, Dhading, Makwanpur, and Parsa)<sup>3</sup>, there were gun battles in 11 of the 29 months from mid 2003 through early 2006. This is shown in Figure 1. The largest number of major gun battles in one month in this area was four, in April 2005. They were larger and intense events that lasted longer in time than an almost instantaneous bomb blast. Reports indicate that during gun battles, nearby civilians were used as human shields and forced to clear dead and wounded persons. Bomb blasts were more frequent, occurring almost every month from mid-2003 until early 2006. July 2004 witnessed 12 bomb blasts, the largest number of blasts in any one month. Although frequent, these bomb blasts generally had little destructive power. Most bombs were small homemade devices, made in

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<sup>3</sup> We consider this to be the 'local' context that can influence individuals' lives and perceptions of exposure to violence. Administrative district boundaries do not hinder the spread of violence or delineate people's perceptions of threat. For example, a bomb blast in Dhading near the border of Chitwan could be perceived as very dangerous to people living in Chitwan nearby the Dhading border. In fact, this event could be perceived as much more salient than a bomb blast on the far side of Chitwan. Furthermore administrative boundaries do not place bounds on the conduct of everyday life; people can certainly go to markets, visit friends or family, or otherwise travel in neighboring districts regularly. One respondent of our semi-structured interviews stated, "All people were affected [by bomb explosions]. If there were explosions in the east, the west was totally closed. Similarly, if there were any explosions in Nawalparasi [a neighboring district], the whole of Chitwan was closed."

pipes, soda bottles, or pressure cookers. Notably, both gun battles and bomb blasts occurred in public areas, including town centers, markets, and roadways. Even if these events were not targeted at specific civilians or groups of people, the public locations of the events created increased threat to those who were more mobile in the community, those who worked, shopped, or traveled outside the home.

Residents of Chitwan were also subject to abductions or forced conscriptions. In addition to abductions for ransom or other political purposes, it was also relatively common for the Maoists to abduct large numbers of people (even whole villages) to undertake physical labor, such as transporting food and supplies, making shelter, building roads or bridges or for Maoist ideological ‘training’ and for extortion. These abductions usually lasted for several weeks, after which the abductees were usually allowed to return to their homes. In addition, forced conscription was also common and undertaken by both Maoists and the government. There are widespread reports that the Maoists demanded one young recruit from each household in many villages. For both labor abductions and forced conscription, unmarried, young adults were the main target.

## **CONTEXT-SPECIFIC PREDICTIONS**

Within the context of the Maoist movement and armed conflict in rural Nepal, we use our event based conceptualization to investigate the consequences of armed conflict for marital behavior, childbearing behavior and migration behavior. To do this we construct and test predictions about the consequences of armed conflict events for the hazard of the first marriage, the hazard of contraceptive use to delay childbearing, and the hazard of moves out of Nepal. Our general model of each of these behaviors is borrowed from recently published research on each specific behavior. Here we focus on consequences of conflict related events on these outcomes controlling for other important known predictors of each outcome.

### **First Marriage**

Because the hazard of first marriage only applies to those who are single and in Nepal the hazard of contraceptive use to delay births generally only applies to those who are married the two outcomes apply to different individuals. In this conflict the single faced different risks than the married. For example, single people were more exposed to threats of forced conscription,

abduction for forced labor, and threats of physical harm than married people. We argue that these threats provide a motivation to marry. As a result, we expect that conflict related events that raised levels of threat increase rates of marriage. Of course violent events, such as gun battles, increased the threat of harm the most, so we expect these events to have the greatest influence on marriage via this mechanism. Political events such as large scale protests, government transitions, or states of emergency might also increase the threat of harm, but probably less than violent events. Ceasefires, on the other hand, reduce the threat of harm and therefore we predict they would slow marriage in Nepal via the threat of harm mechanism in this conflict.

For marriage the instability mechanism is likely to work in the same direction. Among the single in rural Nepal, marriage is a likely response to instability because the marital transition increases personal stability in this setting. Marriage confers a clear social status, a well defined place both socially and residentially, and a larger more diverse social support network (Fricke 1994; Bennett 1983; Thornton and Fricke 1987). As a result, we expect factors which increase instability to speed marriage in Nepal. Large scale protests, government transitions and states of emergency increased instability in this conflict. Violent events such as gun battles may also produce some instability, but because these events are geographically limited in scope they are unlikely to affect the functioning of higher levels of government and law, making them less destabilizing. Ceasefires, on the other hand, enhance stability. Therefore we expect ceasefires to reduce rates of marriage in Nepal via this mechanism. We predict both the threat of harm and instability will produce the same consequences on marriage. This overlap in predictions makes it impossible to differentiate between the two mechanisms with respect to this outcome in this conflict.

Note that these predictions are heavily based on context, specifically the situation that single people were more at risk for harm and that marriage connotes stability in Nepal. In fact, these predictions are from the opposite of results from studies of other conflicts that find evidence that conflict negatively affected marriage (Caldwell 2004; Hueveline and Poch 2007; Jayaraman, Gebreselassie, and Chandrasekhar 2009; Lester 1993; Lindstrom and Berhanu 1999; Shemyakina 2009). However, much of this work is based on aggregate data and the declines in marriage they find may be a result of disruptions in the marriage market caused by increased mortality. This further highlights the need to disaggregate conflicts into specific events and for

micro-level analysis that can separate likelihoods of marriage at the individual level that might be a result of behavior choices from aggregate level declines in marriage that might result from mortality alone.

## **Childbearing**

Theory generally suggests that conflict might be a disincentive to have children, leading people to adopt some form of contraceptive behavior. Both the threat of harm and instability mechanisms lead to this expectation. The evidence from a variety of settings is generally consistent with this expectation. Studies of multiple conflicts demonstrate fertility reductions during periods of conflict and civil disorder in several settings (Agadjanian, Dommaraju, and Glick 2008; Agadjanian and Prata 2001, 2002; Caldwell 2004; Heuveline and Poch 2007; Jayaraman et al. 2009; Lester 1993; Lindstrom and Berhanu 1999). Alternately, other studies find no effect of conflict on fertility in Iran and Beirut, Lebanon (Khat, Deeb, and Courbage 1997; Kulczycki and Saxena 1999; Ladier-Fouladi and Hourcade 1997). However, actual births are different from contraceptive use, the former being subject to contraception, but also to biological factors that can be affected by stress and food insecurity during periods of conflict. Thus documented reductions in births can be the result of biological factors rather than behavioral choice. Contraception, which we examine in this study, is more directly related to behavioral choice and change (still contingent of course upon access).

With regard to choice-based behaviors, childbearing constitutes a major transition with both short- and long-term consequences. Instability that makes it difficult to predict the costs and benefits of childbearing and difficult to arrange birthing services should motivate both short- and long-run delays in childbearing. Likewise, parents are likely motivated to avoid the threat of harm for both themselves and their children – an important tool for avoiding harm is delay of childbearing until the harm has passed.

In Nepal childbearing is exceptionally rare among the single, so we focus on only the married when examining these events. There is good reason to predict that both threat of harm and instability delayed marital childbearing through increasing use of contraception during the Maoist conflict in Nepal. Ceasefires, on the other hand, which reduce the threat of harm and increase stability, we predict will reduce the rate of contraceptive use to avoid childbearing.

## **Migration**

The study of migration, however, points toward important differences between threat of harm and instability. We join the vast majority of previous research in predicting that migration out of the country is a key population response to the threat of harm (Apodaca 1998; Bohra-Mishra and Massey forthcoming; Davenport, Moore, and Poe 2003; Engel and Ibanez 2007; Gibney, Apodaca, and McCann 1996; Melander and Oberg 2006; Moore and Shellman 2004; Morrison and May 1994; Schmeidl 1997; Stanley 1987; Weiner 1996; Zolberg, Suhrke, and Aguayo 1989). Although various factors may make this option costly enough that not all individuals flee (Williams 2009), out-migration is an expected response to the threat of harm. Factors that increase the threat of harm will increase rates of out-migration.

The instability mechanism, however, is not expected to work in the same direction, especially in a setting such as rural Nepal that experienced high rates of migration before conflict. Instability makes it difficult to predict the future and therefore difficult to predict the consequences of migration. The process of migration is risky and essentially destabilizing, involving travel, resettlement in an unfamiliar area, and development of new social relationships and livelihood strategies. Large scale protests, government transitions, and states of emergency make it difficult to know what the long term costs and benefits of migration might be, and they also make it difficult in the short run to make arrangements for international travel, especially in the case of states of emergency where curfews and travel restrictions were enforced. The sense of instability incurred by these events might also make the further risk and destabilization of migration appear less desirable.

These consequences of destabilizing political events are likely to produce strong short term declines in migration as well as more moderate long term declines in this behavior. Violent events such as gun battles, bombings and abductions may also produce this kind of instability, but because these events are more geographically limited in scope, the consequences for slowing migration are likely to be less. Ceasefires, on the other hand, enhance stability including both the long term ability to predict costs and benefits and the short run ability to arrange travel. Therefore we expect ceasefires to increase rates of migration out of Nepal via this mechanism.

In this case our juxtaposition of these two specific mechanisms produces conflicting predictions from the same events. Violent events are predicted to increase rates of migration via the threat of harm, but decrease rates of migration via instability. We expect these events to be

more closely related to threat of harm than to instability and thus have an overall effect of increasing migration. Political events such as strikes and emergencies we predict will also increase rates of migration because of threat of harm and reduce rates of migration through instability. However, we expect these events to be more closely associated with instability than with threat of harm and have an overall effect of decreasing migration. Ceasefires we expect will reduce the threat of harm (reducing migration) and increase stability (increasing migration), and we have no basis to conclude ceasefires will be more strongly associated with either threat of harm or instability. Thus tests of these predictions will demand two-tailed tests and run the risk that strong opposing forces produce the empirical observation of no effect.

## **DATA**

Our data come from several sources—individual survey data from the CVFS, event records from the South Asia Terrorism Portal and other news and institutional sources, and qualitative data from in-depth interviews in the Chitwan Valley. The CVFS is a large-scale multidisciplinary study of the western part of the Chitwan Valley of Nepal, designed to investigate the impact of macro-level socioeconomic changes on micro-level individual behavior (Axinn, Barber, and Ghimire 1997; Axinn, Pearce, and Ghimire 1999; Barber et al. 1997). It includes an individual interview and life history calendar that were collected in the end of 1996 and a prospective demographic event registry that was collected monthly beginning in 1997. The prospective event registry is the source of our marriage, contraception, and migration data, providing exceptionally precise records of each of these behaviors over the full study period. The registry includes 151 neighborhoods that were selected with an equal probability, systematic sample. All individuals between the ages of 15 and 59 and their spouses within these neighborhoods were included in the survey. At 97% of the original sample, the response rates are exceptional.

The South Asia Terrorism Portal ([www.satp.org](http://www.satp.org)), our source for records of violent events, is an Indian-based NGO that compiles records of all violent events in Nepal and other South Asian countries. Records include the exact date, place, and number of people affected (injured or killed) by each bomb blast and major gun battle. For this study, we use records of these events that occurred in Chitwan and the six surrounding districts (Nawalparasi, Tanahu, Gorkha, Dhading, Makwanpur and Parsa).

Measures of political events are compiled from information collected from major English and Nepali news media, situation reports of non-governmental organizations in Nepal such as the Informal Sector Service Center, and the United Nations Nepal Information Platform.

Our qualitative data come from a series of 25 open-ended interviews conducted in the Chitwan Valley during the spring of 2009. The interviews were based on guidelines designed to elicit narratives on respondent's general perceptions of the conflict, their personal experiences and concerns during this period, and their lives during the post-conflict period. Respondents were purposively selected to represent a broad spectrum of the population of this area in terms of gender, age, and socio-economic status. The interviews lasted an average of one hour. Efforts were made to ensure privacy; interviews were typically conducted inside respondent's homes with only the interviewer and respondent present. All interviews were tape recorded with prior permission of the respondent and later transcribed by the interviewer and translated into English by professional translators in Nepal. The research protocol for these data collection was approved by the University of Michigan Internal Review Board.

## **MEASURES**

### **Threat of Harm**

Our conceptualization of armed conflict is based on the idea that different kinds of events can have different meanings, different levels of threat, and might be systematically targeted at different kinds of people. As such, a single measure of threat that is a summation, index, or scale of composed of different types of conflict-related events, or even threatening events, is not appropriate. Instead, we use a measure of one specific type of threatening event- major gun battles. This does not include any gun violence, but major events that involved multiple people, occurred over several hours, generally resulted in multiple fatalities, and were likely to be known about by the general population. With an average of 31 fatalities per major gun battle in Nepal and reports of civilians being used as human shield or to clear dead and wounded bodies, these events created high levels of threat and fear in the general population.

SATP provides records of the date and place of each major gun battle in Nepal. The data cover 51 months, from November 2001 through January 2006. We create a measure of the number of major gun battles per month in the local area. The local area that can influence Chitwan residents' perceptions of threat is defined as Chitwan and the six neighboring districts

(Nawalparasi, Tanahu, Gorkha, Dhading, Makwanpur, and Parsa). These districts are small, more comparable to U.S. counties than states. The combined area of these seven districts is approximately the same as Connecticut, one of the smallest U.S. states. In this area, there were gun battles in 12 of the 51 months of records. The largest number of major gun battles in one month in this area was 4, in April 2005. Data from the CVFS indicate there were no major gun battles in the study area before November 2001. As large, lengthy, and dangerous events, this measure of gun battles produces consistent and robust empirical estimates across all model tests.

As alternate measures of threat, we also test the impact of bomb blasts and abductions on demographic responses. This data also comes from SATP. These events are both threatening, but not as dangerous as major gun battles. Bombs were small, often homemade devices that little destructive power. For example, in this conflict in Nepal, each bomb blast killed or injured an average of 3 people (South Asia Terrorism Portal 2006). Abductions or forced conscriptions are defined as any event where one of the belligerent parties (the Maoists or government forces) forcibly removed an individual or group of individuals from their homes for purposes of ransom or threat, or in many cases for forced labor or Maoist ‘training’. Such abductions threatened the safety of both the individuals who were abducted, as well as their families who were in some cases accused of Maoist sympathies by the government. The results from tests using bomb blasts and abductions as measures of threat, which are discussed in more detail below, were substantively similar to those using major gun battles.

## **Instability**

Our measure of instability is the number of major political events per month. This includes states of emergency, major strikes and protests, and major changes in government that threatened the stability or basic functionality of the central government. A ‘state of emergency’ is any period when the government officially proclaimed a state of emergency, which included proclaiming martial law, limiting constitutional rights, and instituting curfews and travel restrictions. Major changes in government include changes or depositions of the prime minister, the ruling party, the dissolution of parliament, and the 2001 Narayanhiti Palace killings. ‘Strikes and protests’ refer to any such event that involved at least several hundred people, took place nationwide, in Kathmandu and/or other urban areas, and was reported in national Nepali and English language newspapers. All of these events were widely publicized to the general

population and threatened the basic stability of the government, creating a sense of a vacuum of power when it was not clear who was or would be in control of the country.

We also examined alternate specifications of measures of instability. We tested models with a dichotomous measure of any political event in a month, as well as dichotomous measures for each separate type of political event (states of emergency, strikes and protests, government instability)<sup>4</sup>. Because these event types similarly represent instability throughout the country at the highest levels of government, these tests produced comparable results to the models we present below that use a measure of the number of political instability events per month.

## Ceasefires

Ceasefires are measured with a dichotomous variable that is coded '1' in any month when there was an official ceasefire declared and agreed by both belligerent parties (the government and the Maoists). These periods generally involved a cessation of hostilities with the intent to commence negotiations and some resumption of the normal functions of the central government. As a result, ceasefires are a measure of decreases in the threat of harm and at the same time increases in stability.

## Population Responses

All three outcome measures that we test (marriage, contraceptive use, and international migration) come from the CVFS prospective demographic event registry. They are thus time-varying on a monthly basis. Of those who were never married when the study was launched (1996), 73% married during the nine years of the study. This is shown in Table 2 which presents descriptive statistics for this and all other measures. Models of first marriage include several controls that could directly affect the likelihood of marriage and confound the relationships we

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<sup>4</sup> Another initially promising operationalization strategy is principal components analysis (PCA). This could potentially be used to create factors from a variety of threatening and destabilizing conflict events. However, PCA is unfortunately inappropriate for the study of conflict events. PCA examines patterns of correlations between variables that represent characteristics of a single entity with the intent to identify latent characteristics of that single entity. For example, PCA could be used with math test scores and reading test scores to identify a latent characteristic of intelligence about a single individual. For the case of armed conflict, the variables we are considering, such as gun battles and ceasefires, are not characteristics of a single entity. Thus, any factors derived through PCA could not be considered latent characteristics of a single entity, or of these events.

are studying here. These controls are derived from previous literature on marriage in the CVFS sample and include measures shown to significantly affect the likelihood of marriage (Ghimire et al 2006; Yabiku 2004, 2005). These include age, gender, education, ethnicity, and the number of services available within five minutes walk of the respondent's community (including schools, health centers, employer, movie hall, and bus stop). Important characteristics of a respondent's parents are also included, such as their education (the highest number of years that either the mother or father had attained), the parents' age at marriage, the number of children ever born (siblings of the respondent). For more detail on these measures and their theoretical impact on marriage in the Chitwan setting, see Ghimire et al. 2006 and Yabiku 2004, 2005.

For models of contraceptive use, we analyze the transition from never using contraception to using any type of contraception, including the pill, Depo-Provera, condoms, foam, IUD, norplant, abstinence, sterilization, or spouse sterilization. Of those who were married and had never used contraception in 1996, 70% went on to use at least one of these contraceptives during the study period. Similar to the marriage models, controls in the contraceptive models are characteristics of the individual, family, and community that have been shown in past research to affect the likelihood of contraception in this study area (Axinn and Yabiku 2001; Axinn and Barber 2001; Brauner-Otto, Axinn, and Ghimire 2007). These include age, gender, education, ethnicity, wage work experience ever, the number of children ever born to the respondent, and the number of services available in the respondent's community.

The measure of international migration is based on residence records from the monthly demographic event registry. To be considered an international migrant, a respondent must be absent from their original 1996 residence for at least one month and must move to another country during this time. Because the demographic event registry is collected prospectively, this study includes all migrants, a benefit that is not possible with retrospective data that necessarily excludes long-term migrants who have left the study area and not returned to be part of a data collection. The precise definition of migration that we use in this study has been used successfully in past research (Massey et al. 2010; Williams 2009), and allows for the inclusion of both temporary and permanent migrants. This is particularly important for the study of armed conflict, when migration durations can vary significantly and with little relation to migration durations in pre-conflict periods. During the period of this study, 9% of respondents migrated internationally.

Controls in the migration models here include individual, household, and community characteristics that have been shown to significantly affect migration in this and other settings (Bohra and Massey 2009; Donato 1993; Harris and Todaro 1970; Massey 1990; Massey and Espinosa 1997; Massey et al. 2010; Pedraza 1991; Stark and Bloom 1985; Stark and Taylor 1991; VanWey 2005; Williams 2009). These include age, gender, education, ethnicity, marital status, salaried work experience, previous migration experience, and distance to the nearest urban area, the city of Narayanghat. As measures of wealth in this setting that is characterized by subsistence agriculture, we use the number of livestock owned and the amount of land owned by the household. A single measure of livestock ownership was created using standard United Nations Food and Agriculture Organization (FAO) livestock unit conversions for each type of animal and then summing the total number of livestock units. The FAO conversion values are: 1 livestock unit = 1 water buffalo = 0.83 cows = 3.33 pigs = 4 goats = 5 sheep (Agrawal and Gupta 2005). Because land ownership is skewed, the natural log of land ownership is used in this analysis.

## **Time**

For the study of armed conflict, which as we have discussed is a series of events over time, the measurement of time is complex and extremely important. The first three years of the study period here were characterized by almost no conflict-related events that affected the Chitwan area. After this time, the intensity of the conflict in general increased through 2005, with later years experiencing more political events and gun battles, as well as all other types of violent events. Progressive changes in the economy also characterize this period. Thus including no control for time, risks conflating behavioral responses to the specific events we are examining with all other aspects of the conflict and economic changes throughout the time period.

We operationalize a control for time with a continuous variable for years since 1997, the beginning of the study period. This is coded '0' for 1997, '1' for 1998, '2' for 1999, etc. We also tested a fixed effects approach for time, where a dichotomous variable for each year was included in the model. These different approaches yielded nearly the same results. As predicted, tests of all models using no control for time resulted in radically different effects for the specific conflict events on population responses, of which we are skeptical.

## ANALYTIC STRATEGY

We use discrete-time event history models to predict first marriage, first use of any contraception, and first international migration from the Chitwan Valley during the study period in any given month. Person-months are the unit of exposure to risk. The models test the monthly hazard of each of these behaviors, contingent upon measures of threat of harm, measures of instability, ceasefires, and various control measures. We lag all conflict-related measures by one month in order to assure that the results we are measuring (marriage, contraceptive use, and migration) occurred chronologically after the event. For example, the models test the effect of a major gun battle in April on migration in May. Thus this is an examination of the immediate effects of conflict events on demographic behaviors.

We use the logistic regression equation given below:

$$\ln\left(\frac{p}{1-p}\right) = a + \sum (B_k)(X_k)$$

where  $p$  is the probability of undertaking the outcome behavior,  $\frac{p}{(1-p)}$  is the odds of this behavior,  $a$  is a constant term,  $B_k$  is the effect of independent variables in the model, and  $X_k$  is the value of these independent variables.

Models for each outcome behavior are derived directly from previously published research on first marriage, first contraceptive use, and first migration using these same data from the CVFS (Axinn and Yabiku 2001; Brauner-Otto et al 2007; Ghimire and Axinn Forthcoming; Ghimire et al 2006; Massey et al. 2010; Williams 2009). As with previous published research, models for marriage use a sample of respondents who have never been married and are between the ages of 15 and 24. Models predicting the first use of contraception include those who are married, have never used any form of contraception, have at least one child, and are between the ages of 15 and 44. First international migration is modeled for individuals who are between the ages of 15 and 44. We use multi-level modeling techniques to control for clustering at the neighborhood level (Barber et al. 2000).

## RESULTS AND DISCUSSION

### Marriage

Table 3 presents the results of a series of models predicting marriage. As shown in Model 1, which includes only control measures, this model yields similar results to other published studies on marriage in this study area (Ghimire et al. 2006; Yabiku 2004, 2005). Of the statistically significant effects, age, female gender, and education have positive coefficients, increasing the likelihood of marriage for women, with age, and for more educated respondents. Alternately, parental education had a negative effect, meaning that respondents whose parents were more educated, were less likely to marry in any month. Years since the study began also produced significant and positive results. With each extra year since the study began, and independent of all other controls, respondents were about 15% more likely to marry.

Model 2 includes major gun battles, or the measure of threat of harm. As expected, major gun battles increased the likelihood of marriage. With an odds ratio of 1.23, this means that in a month following one major gun battle, respondents were about 23% more likely to marry than otherwise. Abductions also had a positive and significant effect on marriage, with an odds ratio of 1.08 (not shown in table). These results support the theory that increased threat of harm will increase marriage rates. As described above, unmarried individuals were much more likely to be conscripted into military forces and generally experienced higher exposure to harm in the community. As such, marriage is one route to decrease one's threat of harm, as suggested by this positive and significant result.

As shown in Model 3, political events also had a positive and significant effect on marriage. The odds ratio of 1.34 indicates that in a month after one large political event (such as a state of emergency, strike or protest, or major government change, the likelihood of marriage increased by about 34%. Because odds ratios are multiplicative, the odds of marriage increase by 1.80 in a month following two political events, and about 2.40 in a month following three. As a measure of instability, this evidence supports the prediction that instability will increase marriage. As discussed above, in this context marriage increases personal stability. Thus this evidence suggests that in the face of macro-level instability, people might have got married earlier in order to increase stability in their own lives.

Ceasefires had a strong negative and statistically significant effect on marriage. As shown in Model 4, ceasefires decreased the likelihood of marriage by about half. As a measure

of decreased threat of harm and increased stability at the same time, this effect of ceasefires that is opposite of that for gun battles and political events is expected.

Finally, Model 5 presents the results of a model with all three measures of conflict events. The impact of gun battles, political events, and ceasefires remain strong, consistent, and statistically significant.

As we predicted (and consistent with our in-depths interviews), the civilian population caught in armed conflict uses multiple strategies to mitigate the negative consequences of the conflict. In our case as the conflict became more intense with increasing casualties, both warring parties - the Maoist and the Government forces – intensified their recruitment efforts. The results from Table 3 suggest that because unmarried youth are the most vulnerable target of conscription for both the Maoist and the Government security forces, unmarried people in Chitwan responded the threat of being conscripted by marrying. Although political events do not pose as serious a threat as violent events, these events may also signal potential future conscription. On the other hand, ceasefires bring hope for stability and the end of conscription, so young people may not feel as desperate to marry. As a result, in the Chitwan setting for the Nepalese Maoist conflict we find the unusual consequence that ceasefire actually lowers rates of marriage.

## **Contraception**

Similar to the case of marriage, our contraceptive use analyses are directly built on the models from previously published work (Axinn and Yabiku 2001; Axinn and Barber 2001; Brauner-Otto et al. 2007). Here we added our conflict measures to the base model one at a time and combined together to estimate both the total effect and independent effects of each measure. As shown in Model 6 of Table 4, the base model produces results that are consistent with estimates from previous work using these same data.

The addition of measures of conflict to this model demonstrates key fertility related behavioral response to conflict events. Similar to marriage, civilians in conflict do respond to various conflict events through their reproductive behaviors. As shown in Model 7 of Table 4, the odds ratio of 1.14 for gun battles suggests that major gun battles in the previous month increases the contraceptive use, however this effect is only marginally statistically significant. Political events in the previous month have a stronger and statistically significant positive effect on contraceptive use. The odds ratio of 1.45, in Model 8, suggests that the likelihood of using

any contraceptive methods increase by about 45% in a month following a political event. Following two political events, respondents were about two times more likely to adopt contraception, and following three political events, they were more than three times more likely. Similar to marriage, ceasefires had negative effects on the rate of contraception, but this effect was not statistically significant.

Turning to Model 10, which includes gun battles, political events, and ceasefires together in the same model, the effect of political events is again positive and significant. In this model, gun battles are also statistically significant with an odds ratio of 1.18, indicating an 18% higher likelihood of adopting contraception in a month following one gun battle. Ceasefires remain statistically non-significant. Overall, these results show strong support for the prediction that events that create instability will result in increased contraception and some support for the prediction that threat of harm can also increase contraception.

Contraceptive use provides an important behavioral indicator of couples fertility plans and intentions. Our analysis of this indicator is consistent with the conclusion that ordinary people work to mitigate the adversity of conflict through their childbearing behavior. Both gun battles and political events encourage contraceptive use suggesting that during political turmoil and uncertainties people preferred to avoid childbearing. As we discussed in detail above most, political events are characterized by strikes, disruption of supplies of essential goods, disruption of transportation and disruption of key services including health care services. As a result, it is difficult both to give a birth to a child and to take care of that child after birth. This is a likely reason for a strong effect of political events on contraceptive use. However, the threat of physical harm associated with open gun battles also has an important and independent effect that increases contraceptive use. This threat of harm to both parents and their new born children is substantial enough to motivate parents to delay their childbearing and take action (contraception) to accomplish that goal.

## **Migration**

We find strong effects of threat of harm on migration. As shown in Model 12, the odds ratio for gun battles is 1.77, meaning that respondents were about 77% more likely to migrate internationally in a month following one major gun battle. Given three gun battles, this increases to over five times more likely to migrate. Similarly, tests of bomb blasts show a marginally

significant odds ratio of 1.15 on migration and an odds ratio of 1.54 (significant to  $p < .001$ ) on migration. In general, this evidence for gun battles and bomb blasts suggests that threat of harm had positive effects, increasing international migration. This is consistent with existing theory that identifies international migration during armed conflict as a strategy to decrease exposure to harm. It is also consistent with existing empirical evidence from other conflicts (Apodaca 1998; Bohra-Mishra and Massey forthcoming; Davenport et al. 2003; Engel and Ibanez 2007; Gibney et al. 1996; Melander and Oberg 2006; Moore and Shellman 2004; Morrison and May 1994; Schmeidl 1997; Stanley 1987; Weiner 1996; Zolberg et al. 1989).

Alternately, our measure of political events was negative and strong, but was not statistically significant. Thus we fail to find evidence that this measure of instability affected migration as we expected it would. Similarly in Model 14, the effect of ceasefires shows no significant impact on international migration. As discussed earlier, ceasefires are a measure of both decreased threat (which theoretically suggests lower migration) and increased stability (which theoretically suggests higher migration). Thus the non-significant effects of ceasefires on international migration could mean that they indeed have no effect, or that there are strong effects of both decreased threat and increased stability in opposing directions, producing the empirical result of no effect. Overall, these results for international migration provide evidence that specific violent events that increase threats of harm can increase out-migration in the immediate months. We do not find support for the hypothesis that instability decreases migration, but argue that further research will be needed to fully address this theoretical relationship.

## **CONCLUSION**

This article advocates a new micro-level approach to social scientific study of armed conflict and its influence on behaviors in the general population. The first component of this approach is the decomposition of a period of conflict into the separate violent and political events of which it is comprised. The second component is careful conceptualization of the different dimensions of meaning of these events and consideration of how these meanings create different mechanisms that link events to specific behavioral outcomes. The third component is examination of the differential risks within the population experiencing these events and micro-level analysis to

address individual risk differentials. The fourth component of our approach is careful consideration of context in theoretical development and empirical testing.

To test our micro-level approach to investigation of armed conflict, we focus on three specific demographic outcomes, timing of first marriage, timing of contraceptive use to avoid births, and timing of international migration. Certainly most demographers would argue that marriage, contraception, and migration are related to each other, but as a field we generally nonetheless study them as separate demographic processes. In fact each of these demographic processes reflects an important sub-field of demography, with a substantial theoretical and empirical literature. In our case, treating them separately allows us to both formulate rigorous micro-level models of each behavior, and to consider how key mechanisms such as the threat of harm and instability may affect each process differently.

One key result of our analysis is strong micro level evidence that conflict events influence each of these different demographic processes. A second is that the same conflict events can have opposing substantive consequences across these different demographic processes. A third is that different conflict events can have opposing consequences on the same demographic process. Together, these three results illustrate our general conclusion – when macro-level conflict is disaggregated into the micro-level events that comprise the conflict, empirical analyses reveal the demographic consequences of conflict are in fact quite complex.

These results point to a tremendous theoretical challenge that we do not attempt to resolve here. That is, if each different dimension of a conflict can have varying and even opposing consequences for each different demographic process, how do we predict specific consequences of specific conflict events? Though resolution of this important theoretical question is not our aim, we do aim to provide what we argue is an essential foundation for advancement toward such resolution – a new micro-level conceptualization of conflict that can be used to build theories of the connection between specific conflict events and specific demographic processes.

Our effort reveals that event, setting, and outcome specific reasoning will be required to arrive at reasonable predictions for the consequences of armed conflict. Such reasoning is commonplace in other areas of social demography, yet still underdeveloped in the study of armed conflict. Our reasoning highlights the potential of two key mechanisms – threat of harm and instability – to link specific events to specific outcomes. The evidence we provide from

Nepal is consistent with our reasoning. Among the unmarried in Nepal events associated with both the threat of harm and instability increase rates of marriage. In this specific conflict in Nepal, the unmarried were at great risk of forced conscription and our evidence suggests that this risk motivated marriage to avoid the threat of harm. Motivation to marry was also heightened as a reaction to macro-level instability, because marriage greatly improves personal stability in this setting. Thus ceasefires were associated with declines in rates of marriage, likely because of both of these mechanisms.

Events associated with the threat of harm also increased contraceptive use to avoid birth among the married. In a situation of threat of harm, prospective parents were motivated to avoid or delay childbearing to reduce the threat of harm to their children – a finding consistent with results from several other settings (Agadjanian et al. 2008; Agadjanian and Prata 2001, 2002; Caldwell 2004; Heuveline and Poch 2007; Jayaraman et al. 2009; Lester 1993; Lindstrom and Berhanu 1999). Instability and reduced ability to predict the future associated with these same events may have exacerbated these consequences because it was difficult to predict the costs and benefits of childbearing, motivating a delay. Events more closely associated with instability than with threat of harm produced results consistent with this prediction. And ceasefires, which reduce the threat of harm and increase stability, were associated with modest declines in the use of contraception. Most important, these different influences on contraceptive use behavior were independent of one and other.

For the case of international migration, we find that events associated with threats of harm significantly increase migration out of Nepal during this period. This evidence is certainly consistent with evidence from other settings around the world and indicates the migration is an important strategy to decrease exposure to harm during armed conflict (Apodaca 1998; Bohra-Mishra and Massey forthcoming; Davenport et al. 2003; Engel and Ibanez 2007; Gibney et al. 1996; Melander and Oberg 2006; Moore and Shellman 2004; Morrison and May 1994; Schmeidl 1997; Stanley 1987; Weiner 1996; Zolberg et al. 1989). Although we find no evidence that instability was associated with international migration in this setting, we argue that further research should address and test this possibility.

Of course this micro-level approach to investigating conflict also highlights other potentially important dimensions of conceptualizing conflict events in addition to threat and instability. A few of these dimensions includes timing and sequencing of events, spatial

distribution of events, and public versus private threats. With regards to timing, in this study we examine the immediate (within one month) behavioral responses. However, the consequences of an event may endure for a long time after the event occurs. This complexity may be exaggerated by the fact that the relevant lag time may vary by the event itself or by the behavioral response being studied. For example, we might expect longer lag times for marriage, which can take longer to arrange, than for contraception which can be procured relatively quickly. Furthermore, one event alone may have less influence than the accumulation of multiple events over time. For example, although one gun battle may affect behavior, the behavioral response may increase as the cumulative number of gun battles increases. Alternately, desensitization could occur, whereby behavioral responses would decrease as gun battles accumulate over time.

The spatial distribution of events could also influence behavioral responses. It is highly likely that events nearer to an individual's community will have greater influence than those that are more distant. There might also be a radius of influence, outside of which events would have no impact on behavior. For example, imagine a bomb blast in your home community. This would clearly affect behavior in some way. Alternately, imagine a bomb blast five states away. Although in the same country, this latter bomb blast might not increase fear or affect behavior in significant ways. As a result, collection of geographic data on the exact location of individual events and spatially explicit analysis, taking into account possible decreasing influence of events with distance and possible radii of influence, will be essential for the advancement of the study of behavioral consequences of armed conflict.

The third dimension we suggest for future research is risk in public versus private areas, or which events occur mainly in public areas and which incur threat even in the private area of the home. For example, bomb blasts were often placed in roads, markets, and other public places. On the other end of the public-private spectrum were billeting and house raids which created a situation where private civilian households could quickly become military targets and were no longer safe havens. Perceptions of fear of public and private areas can have a tremendous influence on people's decisions about daily lives and behavior. The specific constellation of publically and privately threatening events at any time will likely determine a different set of responsive behaviors amongst the civilian population.

Though in some sense these issues close our analysis with more questions than answers, we argue they highlight the most important conclusion from our investigation – a micro-level

approach to the study of armed conflict yields the opportunity for tremendous advances in this area of science. The approach we advocate demands richer theoretical explanation of cause and consequence and equally rich empirical evidence of specific conflict events. Such theory and evidence are the basic fuel of scientific advancement – we argue this field is both greatly in need of such advance and ready for those advances to flourish. The approach we demonstrate here is aimed to provide one of the tools social scientists can use to make those advances happen.

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## TABLES AND FIGURES

**Table 1. Timeline of Major Political Events during Armed Conflict in Nepal**

<b>Date</b>	<b>Events</b>
<b><i>Government Instability</i></b>	
March 2000	Change in Prime Minister (PM)
June 2001	Palace Killings
July 2001	Change in Prime Minister
May 2002	Prime Minister dissolves parliament
October 2002	King deposes Prime Minister and takes up executive powers
May 2003	Change in Prime Minister
June 2004	Change in Prime Minister
August 2004	Maoists blockade Kathmandu for 1 week
February 2005	King assumes absolute power – direct rule
June 2005	Change in Prime Minister
<b><i>State of Emergency</i></b>	
Nov. 2001 - August 2002	State of Emergency
February - April 2005	State of Emergency
<b><i>Ceasefires</i></b>	
July – November 2001	First ceasefire
January - August 2003	Second ceasefire
Sept. 2005 - January 2006	Third ceasefire
<b><i>Major Strikes and Protests</i></b>	
February (yearly since '01)	Annual Maoist anniversary of “People’s War”, week- long protests
April 2001	General nationwide strike, markets and transportation affected
April 2002	5-day nationwide strike, called by Maoists
April 2003	Call for three- day national strike
August 2003	Maoists call day-long strike
September 2003	Three-day general strike,
May 2004	Street protests called by political parties, restoration of Parliament
June 2004	Street protests continue
April - May 2005	Protests, strikes, failure of peace talks
September 2005	Daily protests, restoration of democracy

**Table 2. Descriptive statistics of the CVFS sample in 1997**

MEASURE	Range	Mean	Std dev
<b>Conflict Related Events <sup>a</sup></b>			
Gun battles (# per month)	(0-4)	0.16	0.59
Political events	(0-3)	0.28	0.53
Ceasefires	(0,1)	0.16	0.37
<b>Full sample, ages 15-44</b>			
Age	(15-44)	27.83	8.38
Gender (female)	(0,1)	0.55	0.50
Ever migrated (before 1997)	(0,1)	0.25	0.43
Migrated during study period	(0,1)	0.09	0.28
Education (years completed)	(0-16)	5.06	4.33
Salaried work experience	(0,1)	0.12	0.33
Farmland owned (acres)	(0-17)	2.02	2.40
Livestock owned (livestock units)	(0-19)	2.93	2.54
Distance to Narayanghat	(0-18)	8.61	4.11
<b>Marital Status</b>			
Never married	(0,1)	0.27	0.44
Married, living with spouse	(0,1)	0.55	0.50
Married, not living with spouse	(0,1)	0.16	0.36
Divorced, Separated, Widowed	(0,1)	0.02	0.14
<b>Ethnicity</b>			
Upper Caste Hindu	(0,1)	0.48	0.50
Lower Caste Hindu	(0,1)	0.10	0.30
Hill Tibeto-Burmese	(0,1)	0.15	0.35
Terai Tibeto-Burmese	(0,1)	0.21	0.41
Newar	(0,1)	0.06	0.24
<b>Sample used to analyze marriage- Unmarried individuals, ages 15-24 in 1997</b>			
Married during study period	(0,1)	0.73	0.44
Community services (in adult community)	(0-5)	2.50	1.26
<b>Parents' Characteristics</b>			
Age at marriage	(6-36)	18.87	4.63
Number of children ever born	(0-13)	5.40	2.18
Education	(0-16)	3.42	4.30
<b>Sample used to analyze contraception- Married individuals, ages 15-44 in 1997</b>			
Started using contraception during study period	(0,1)	0.70	0.46
Number of children ever born	(0-10)	2.19	2.08
Wage work experience	(0,1)	0.46	0.50

<sup>a</sup> The unit of measure for conflict related events in months.

<sup>b</sup> The unit of measure for all other characteristics is persons.

**Table 3. Logistic regression estimates, predicting first marriage following violent and political events**

	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Conflict Events</b>					
Gun battles (# per month)		1.22 *** (3.20)			1.22 *** (3.18)
Political events (# per month)			1.34 *** (4.21)		1.26 *** (3.13)
Ceasefires				0.43 *** (5.39)	0.48 *** (4.56)
<b>Individual Characteristics</b>					
Age	1.13 *** (6.56)	1.13 *** (6.53)	1.13 *** (6.57)	1.13 *** (6.53)	1.13 *** (6.51)
Gender (female)	2.01 *** (8.03)	2.00 *** (8.00)	2.00 *** (8.01)	2.00 *** (7.98)	1.99 *** (7.95)
Education	1.02 (1.03)	1.02^ (1.04)	1.02 (1.00)	1.02 (1.04)	1.02 (1.03)
Community Services	0.98 (0.42)	0.98 (0.42)	0.98 (0.43)	0.98 (0.42)	0.98 (0.42)
<b>Ethnicity <sup>a</sup></b>					
Lower Caste Hindu	1.12 (0.62)	1.12 (0.61)	1.12 (0.64)	1.12 (0.62)	1.12 (0.63)
Hill Tibeto-Burmese	1.24 ^ (1.43)	1.24 ^ (1.43)	1.24 ^ (1.43)	1.24 ^ (1.42)	1.24 ^ (1.42)
Terai Tibeto-Burmese	0.94 (0.36)	0.94 (0.38)	0.94 (0.35)	0.94 (0.35)	0.94 (0.36)
Newar	0.78 ^ (1.41)	0.78 ^ (1.31)	0.78 ^ (1.30)	0.78 (1.28)	0.78 (1.28)
<b>Parental Characteristics</b>					
Education	0.94 *** (4.93)	0.94 *** (4.92)	0.94 *** (4.93)	0.94 *** (4.90)	0.94 *** (4.90)
Age at marriage	1.00 (0.05)	1.00 (0.06)	1.00 (0.03)	1.00 (0.06)	1.00 (0.05)
# of children	1.00 (0.13)	1.00 (0.15)	1.00 (0.14)	1.00 (0.13)	1.00 (0.16)
Year	1.15 *** (8.94)	1.13 *** (7.20)	1.12 *** (6.72)	1.18 *** (10.45)	1.13 *** (6.46)
Deviance	6419	6413	6405	6389	6375
No. of Obs. (person-months)	53,701	53,701	53,701	53,701	53,701

Note: Estimates are presented as odds ratios. Z-statistics are given in parentheses.

<sup>a</sup> Reference category is: Upper Caste Hindu.

^p < .10 \*p < .05 \*\*p < .01 \*\*\*p < .001

One-tailed tests for all measures.

**Table 4. Logistic regression estimates predicting first use of any contraception following violent and political events**

	Model 6	Model 7	Model 8	Model 9	Model 10
<b>Conflict Events</b>					
Gun battles (# per month)		1.14 ^ (1.48)			1.18 * (1.95)
Political events (# per month)			1.45 *** (4.75)		1.47 *** (4.77)
Ceasefires				0.84 (1.17)	0.99 (0.08)
<b>Individual Characteristics</b>					
Age	0.96 *** (5.47)	0.96 *** (5.47)	0.96 *** (5.51)	0.96 *** (5.47)	0.96 *** (5.50)
Gender (female)	0.90 (1.19)	0.90 (1.18)	0.90 (1.20)	0.90 (1.19)	0.90 (1.18)
Education	1.03 ** (2.37)	1.03 ** (2.36)	1.03 ** (2.38)	1.03 ** (2.38)	1.03 ** (2.37)
Community Services	0.94 (1.26)	0.94 (1.27)	0.94 (1.25)	0.94 (1.26)	0.94 (1.25)
Wage work experience	1.01 (0.15)	1.01 (0.15)	1.01 (0.14)	1.01 (0.15)	1.01 (0.14)
# of children ever born	1.19 *** (6.66)	1.19 *** (6.65)	1.19 *** (6.70)	1.19 *** (6.66)	1.19 *** (6.69)
<b>Ethnicity <sup>a</sup></b>					
Lower Caste Hindu	1.14 (0.83)	1.14 (0.83)	1.14 (0.86)	1.14 (0.83)	1.14 (0.85)
Hill Tibeto-Burmese	1.11 (0.69)	1.10 (0.69)	1.11 (0.70)	1.11 (0.69)	1.11 (0.70)
Terai Tibeto-Burmese	0.87 (0.96)	0.87 (0.97)	0.87 (0.94)	0.87 (0.96)	0.87 (0.94)
Newar	0.91 (0.44)	0.91 (0.45)	0.91 (0.44)	0.91 (0.45)	0.91 (0.44)
Year	0.96 ** (2.77)	0.95 *** (3.08)	0.93 *** (4.31)	0.96 * (2.17)	0.91 *** (4.26)
Deviance	7206	7204	7186	7205	7183
No. of Obs. (person-months)	56,635	56,635	56,635	56,635	56,635

Note: Estimates are presented as odds ratios. Z-statistics are given in parentheses.

<sup>a</sup> Reference category is: Upper Caste Hindu.

^p<.10 \*p<.05 \*\*p<.01 \*\*\*p<.001

One-tailed tests for all measures.

**Table 5. Logistic regression estimates predicting first international migration following violent and political events**

	Model 11	Model 12	Model 13	Model 14	Model 15
<b>Conflict Events</b>					
Gun battles (# per month)		1.77 ** (2.78)			1.86 ** (2.72)
Political events (# per month)			0.56 (1.07)		0.56 (1.23)
Ceasefires				1.09 (0.15)	0.71 (0.68)
<b>Individual Characteristics</b>					
Age	0.93 *** (4.08)	0.93 *** (4.60)	0.93 *** (3.82)	0.93 *** (4.07)	0.93 *** (4.46)
Gender (female)	0.17 *** (6.34)	0.18 *** (7.15)	0.17 *** (5.94)	0.17 *** (6.33)	0.18 *** (6.94)
Education	1.01 (0.40)	1.01 (0.43)	1.01 (0.40)	1.01 (0.39)	1.01 (0.46)
Salaried work	1.16 (0.59)	1.14 (0.61)	1.15 (0.54)	1.16 (0.59)	1.14 (0.59)
Land ownership	1.09 (0.96)	1.09 (1.09)	1.08 (0.76)	1.09 (0.97)	1.07 (0.86)
Livestock ownership	0.90 * (1.91)	0.90 * (2.17)	0.90 * (1.73)	0.90 * (1.91)	0.91 * (2.02)
Ever migrated	2.32 *** (3.90)	2.31 *** (4.39)	2.32 *** (3.65)	2.32 *** (3.89)	2.31 *** (4.26)
Distance to Narayanghat	1.03 (1.13)	1.03 (1.26)	1.03 (1.09)	1.03 (1.12)	1.03 (1.27)
<b>Marital Status <sup>a</sup></b>					
Never married	0.76 (0.95)	0.78 (1.01)	0.77 (0.89)	0.77 (0.95)	0.77 (1.00)
Married, not living w/ sps	0.88 (0.47)	0.87 (0.55)	0.88 (0.43)	0.88 (0.46)	0.88 (0.52)
Divorced or widowed	1.05 (0.07)	1.03 (0.05)	1.05 (0.06)	1.05 (0.07)	1.04 (0.05)
<b>Ethnicity <sup>a</sup></b>					
Lower Caste Hindu	1.14 (0.41)	1.15 (0.49)	1.13 (0.37)	1.14 (0.42)	1.14 (0.44)
Hill Tibeto-Burmese	1.42 ^ (1.38)	1.42 ^ (1.57)	1.41 (1.28)	1.42 ^ (1.38)	1.41 ^ (1.50)
Terai Tibeto-Burmese	0.48 * (2.28)	0.48 ** (2.57)	0.48 * (2.14)	0.48 * (2.28)	0.48 ** (2.50)
Newar	0.40 ^ (1.43)	0.40 ^ (1.61)	0.40 ^ (1.34)	0.40 ^ (1.42)	0.40 ^ (1.57)
Year	0.60 *** (7.46)	0.59 *** (8.85)	0.63 *** (6.14)	0.60 *** (7.13)	0.61 *** (7.31)
Months of the year included in all models, but results not shown here.					
Deviance	3667	3657	3663	3667	3653
No. of Obs. (person-months)	266,889	266,889	266,889	266,889	266,889

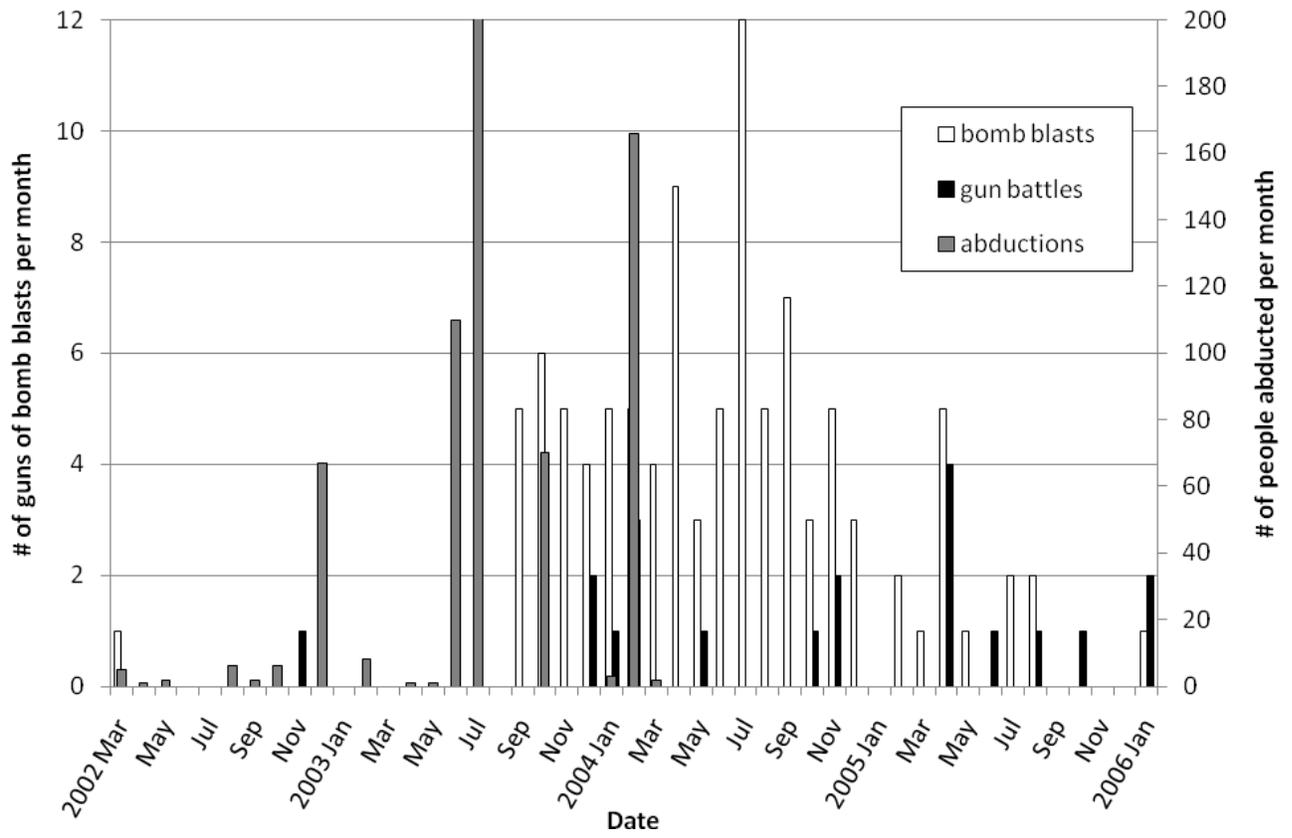
Note: Estimates are presented as odds ratios. Z-statistics are given in parentheses.

<sup>a</sup> Reference category is: Upper Caste Hindu.

^p<.10 \*p<.05 \*\*p<.01 \*\*\*p<.001

Two-tailed tests for ceasefires. One-tailed tests for all other measures.

Figure 1. Bomb blasts and major gun battles in Chitwan and surrounding districts





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