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Individual Decisions to Migrate During Civil Conflict

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Abstract

The existing literature on forced migration limits our understanding of how violence affects migration to competing destinations. This article adds to the literature on forced migration by studying how armed violence during a period of civil conflict in south-central Nepal influenced the likelihood of local, internal, and international migration. We find that violence has a nonlinear effect on migration, such that low to moderate levels of violence reduce the odds of movement, but when violence reaches high levels, the odds of movement increase. We also find that the effect of violence on mobility increases as the distance of the move increases. When we consider the influence of violence on microlevel decision-making, we find that the effects of individual and household-level determinants were mostly consistent with hypotheses derived from contemporary theories of voluntary migration and that no predictor of migration influenced the decision to migrate differently in the presence of violence.

Keywords

Nepal; Violence; Migration; Emigration

Civil violence is seemingly endemic to the contemporary world, and no region is immune. In the Americas, guerilla warfare surged in Nicaragua, El Salvador, and Guatemala during the 1980s and continues today in Colombia. In Europe, waves of violence have washed over the Balkans and former Soviet Republics, while Africa has been repeatedly stained by bloody conflicts in places such as Rwanda, Liberia, Sierra Leone, Sudan, Congo, Somalia, and Zimbabwe. In Asia, violence has erupted in the Philippines, Thailand, Malaysia, Myanmar, Indonesia, and parts of China. All these conflicts have produced significant displacements of people, both within and across national borders. According to the U.N. High Commissioner for Refugees, at the end of 2007, the number of forced migrants included 11.4 million external refugees and 13.7 million internally displaced persons (UNHCR 2008).

A number of aggregate-level studies have examined the effect of violence on migration and have generally found a strong connection between the two, though debate remains about whether the effect is direct or indirect. In his analysis of emigration from El Salvador to the United States, Jones (1989) concluded that the effect was indirect, with violence producing local economic dislocations that, in turn, led to emigration. Likewise, Morrison and May (1994) found that conflict-related economic turmoil was more important than violence in predicting out-migration between provinces in Guatemala. Schultz (1971) also found that rural violence was significant in predicting migration to Colombian cities, though its effect was small compared with other socioeconomic and demographic variables. Stanley (1987)

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found that military sweeps rather than killings per se were more strongly associated with variations in the flow of undocumented migrants from El Salvador to the United States.

Most other aggregate-level studies have discerned a direct connection between violence and migration, however. Shellman and Stewart (2007), for example, found that trends in Haitian emigration to the United States were strongly predicted by surges in political violence, even after the influence of economic conditions was held constant. Morrison (1993) likewise found that out-migration between provinces in Guatemala was strongly predicted by violence as well as economic conditions, and Morrison and Perez Lafaurie (1994) obtained similar results in Colombia. Morrison (1993) noted an apparent threshold effect in the relationship between violence and internal migration in Guatemala, such that the likelihood of movement increased only once violence reached a certain level, suggesting that at low to modest levels of violence, people may feel safer remaining in their own homes.

In addition to the foregoing country studies, cross-national comparative analyses also suggest a direct connection between violence and migration. A pooled time-series analysis by Schmeidl (1997) found that violence predicts international refugee flows more strongly than national economic conditions, and the fixed-effects model of Davenport et al. (2003) revealed that genocide, political violence, and civil war each strongly predicted refugee migration independent of economic circumstances. Another study by Moore and Shellman (2006) found that state violence toward civilians tended to produce international refugees, whereas high levels of dissident violence and civil warfare tended to produce internally displaced people (IDPs). Melander and Öberg (2007) have suggested that migration is more a product of the geographic scope of violence and the extent to which it touches urban areas rather than its intensity. In her review of the macro-level literature, Schmeidl (2001:85) concluded “that refugee flows are affected by state implosions and/or the formation of new states, genocidal violence, and internal struggles (particularly those fueled by foreign military interventions).”

In contrast to the relative abundance of aggregate studies, few analyses have examined the connection between violence and migration at the individual or household level. In their survey of displaced and nondisplaced persons in Colombia in 2000, Engel and Ibáñez (2007) found that the threat of violence and the presence of paramilitary and guerilla groups were strongly associated with out-migration, and Ibáñez and Vélez (2008) demonstrated that these associations hold up well under a variety of controls. Lundquist and Massey (2005) undertook an event history analysis of out-migration from households surveyed in Nicaragua and found that violence during the U.S.-sponsored Contra War strongly predicted out-migration to the United States, whereas conflict-related economic distress promoted migration to neighboring Costa Rica. Alvarado and Massey (2010) showed that Nicaraguan migration to the United States also rose in response to increases in lethal violence that accompanied the imposition of structural economic adjustment policies during the 1990s. In Mexico and Costa Rica, however, they found that the increases in lethal violence were more modest and were generally associated with a lower probability of emigration to the United States.

Research to this point thus suggests a clear connection between civil violence and migration, though the degree to which this association is mediated through the effect of violence on economic conditions is unclear. Also unclear is whether the effects of violence are similar for short- and long-distance moves and for internal versus international movement. Furthermore, only a few studies to date have examined the influence of violence on microlevel decision-making, and no study has yet considered the determinants of forced migration at multiple levels. Finally, it is unclear whether the influence of violence is

characterized by threshold effects, such that rising violence induces movements only above a certain point, and below that violence might actually reduce the odds of movement.

In this article, we seek to rectify these shortcomings in the existing literature, although we are unable to test whether the effects of conflict are direct or indirect because this exercise would require time-varying measures of economic conditions, and our economic measures are static. Using fixed economic conditions as controls, we undertake a systematic event history analysis of how violence unleashed during Nepal's Maoist insurgency of 1996–2006 affected the likelihood that people moved locally, internally, or internationally, holding constant other individual and household characteristics. Nepal offers a good test case for estimating the influence of violence on migration because its insurgency lasted a full decade, during which the scope and intensity of the conflict fluctuated considerably to produce substantial variation in the variable of interest.

Our study improves on existing research in several ways. First, we consider competing geographic destinations in the same model. To date, most studies have either modeled the movement of refugees internationally (see Apodaca 1998; Iqbal 2007; Schmeidl 1997; and Shellman and Stewart 2007) or focused on internal displacements (see Ibáñez and Vélez 2008; Morrison 1993; Morrison and Perez Lafaurie 1994; Schultz 1971). Relatively few studies have considered both kinds of migration at the same time (see Davenport et al. 2003; Melander and Öberg 2007; Moore and Shellman 2004), and so far, none have distinguished between local and long-distance internal moves. Our analysis also controls for the effects of human capital, social capital, physical capital, and demographic characteristics because these factors are expected to continue to promote voluntary migration even during periods of civil conflict. Following Schmeidl (1997) and Clark (1989), we predict the odds of migration by considering the determinants of migration classified into one of three basic categories: root causes, proximate causes, and intervening factors.

We begin with a brief history of the Maoist insurgency in Nepal, followed by an introduction to the study site and its connection to the conflict. We then describe the multilevel longitudinal survey from which we take our data. After presenting the analytic model and discussing how we operationalize key variables, we offer new findings about how violence affects migration to local, internal, and international destinations and draw relevant theoretical, substantive, and policy conclusions.

The People's War in Nepal

The history of Nepal as a nation state begins with King Prithvi Narayan Shah's conquest of several smaller scattered kingdoms and their consolidation into a single state in 1768. Prime Minister Jung Bahadur Rana usurped absolute power in 1846, though he left the monarchy in place as a figurehead. For the next 104 years, the Rana family ruled the country as a private fiefdom, an arrangement that persisted until the Delhi Compromise of February 1951, in which King Tribhuvan, the Rana family, and the Nepali Congress Party agreed to end Rana rule (Thapa and Sijapati 2004). Just as the country began moving toward reform and development, however, King Mahendra dissolved parliament in 1959 and took control. In December 1962, he established the Panchayat system, which abandoned party politics for his version of a "guided democracy," ushering in three decades of absolute rule.

After 30 years of autocracy, the people's movement for democracy won a new constitution in 1990 that reinstated democratic rule and transformed the King into a constitutional monarch. The new constitution did not fully meet the demands of several long-suppressed groups, however, which continued to chafe at domination by higher castes. Even worse, the democratic government seemed in many ways to extend the Panchayat system and was characterized by corruption, bitter power struggles, and the continued exploitation of

peasants and ethnic minorities. Nepal remained a multiethnic country run by higher-caste Bahuns and Chhetris who continued to subjugate other ethnicities, religions, and castes under a Hindu theocracy (Thapa and Sijapati 2004).

In response to this history of inequality and exploitation, the Communist Party of Nepal (Maoist) submitted demands for change to the government on February 4, 1996, and when these demands were ignored, it launched an armed insurgency known as the "people's war" on February 13, 1996. Owing to the neglect and marginalization of minorities and the poor under a feudal system that actually worsened under democratic rule, communist ideology became rooted in the Mid-Western district of Rolpa (see Fig. 1), which constituted the stronghold from which Maoist guerillas launched their insurgency to establish a "People's Republic of Nepal." Soon, the surrounding districts of Rukum, Salyan, Pyuthan, and Jajarkot also became Maoist strongholds.

Although socioeconomic inequality and discrimination by caste and ethnicity were major causes of the conflict, one cannot ignore spatial aspects of the insurgency (Murshed and Gates 2005). In a country where more than 80% of the population remains rural, development efforts nonetheless historically focused on urban areas. Among Nepal's five development regions (see Fig. 1), the Eastern, Central, and Western Regions contain the most important cities and display the highest levels of development. In terms of the Human Development Index (HDI, which combines normalized measures of life expectancy, literacy, educational attainment, and GDP per capita), the 1998 value for the Western Region stood at .35, and that for the Central and Eastern Regions was .34 (on a 0 to 1 scale). In contrast, the Mid-Western and Far-Western Regions had respective HDIs of just .26 and .27 (Nepal South Asia Centre 1999). At the district level (see Fig. 1), the degree of variation was even greater, with scores ranging from more than .60 in Kathmandu (in the Central Region) to under .20 in Mugu, Kalikot, and Bajura (in the Far-Western Region).

Once the insurgency began, low-development provinces generally experienced the greatest violence (see Do and Iyer 2006). Empirical analyses by Murshed and Gates (2005) reveal that variation in the intensity of the insurgency across Nepal's75 districts was positively and significantly related to the degree of income inequality. According to these authors, a low-intensity conflict is one with fewer than 25 battle-related deaths per year and no more than 1,000 battle-related deaths in total; a medium-intensity conflict has between 25 and 1,000 battle-related deaths per year and accumulated deaths in excess of 1,000; and a high-intensity conflict has more than 1,000 battle-related deaths per year.

During the insurgency, violence began to escalate on September 25, 2000, when Maoists overran Dunai, the headquarters of Dolpa district, killing 14 police personnel (Hutt 2004). Still, until November 21, 2001, the conflict was only of medium intensity and involved mainly insurgents and the police. After peace talks failed, however, the government proclaimed a state of emergency and denounced the Maoist rebels as terrorists in November 2001. Thereafter, the insurgency grew into a high-intensity conflict that involved the Royal Nepalese Army (Murshed and Gates 2005), and by late 2002, violence between the Maoists and government forces was reported in 73 of Nepal's 75 districts (Kok 2003).

The insurgency finally ended on November 21, 2006, with the signing of a Comprehensive Peace Agreement, making the "people's war" in Nepal one of the longest and most intense conflicts in contemporary times. Between February 1996 and December 2006, 8,377 people were killed by government forces and another 4,970 were killed by Maoist insurgents, yielding a total of 13,347 deaths (Informal Sector Service Center 2008). The civil war gave rise to widespread human rights abuses, such as abduction, forced conscription, torture, rape, extortion, use of civilians as human shields, forced billeting, arbitrary taxation, and local

wildcat strikes. Together, the ongoing violence and these abuses created a state of terror, resulting in the displacement of thousands of people.

Displacements linked to the conflict were both internal and international. Some moved to district capitals and large cities such as Kathmandu and Nepalgunj, while others went across the border to India (see Martinez 2002). According to Indian Embassy officials, around 120,000 displaced Nepalese crossed the border into India in January 2003 alone because of the insurgency (Kok 2003); and given the open border between India and Nepal, actual migration is likely higher than official figures indicate. Although exact figures on forced migration do not exist, evidence from many sources suggests that migration both to internal and international destinations surged dramatically as a consequence of the civil conflict, owing not only to the threat of violence but also to declining agricultural and economic production.

The Chitwan Study Site and Survey

As shown in Fig. 1, the Chitwan Valley lies in the central development region of Nepal, where it shares a border with India to the South and is one of the most developed and fertile areas of the country. As recently as the early 1950s, however, the valley was covered by dense forest, which was subsequently cleared by the government to make land available to settlers. The favorable climate, flat terrain, and fertile soil were attractive to people in nearby hills and mountains, who migrated to the newly cleared area in large numbers in search of opportunities. In the late 1970s, Narayanghat, Chitwan's largest town, was connected by road to other cities throughout the country, including the capital Kathmandu, as well as to India. As a result, the city began to attract government services, business investments, and jobs, and development spread throughout the valley, with the degree of influence falling with distance from Narayanghat.

Given its relatively high level of economic development and flat terrain, which was less suited to guerrilla tactics compared with the hills and mountains, Chitwan was exposed to relatively moderate levels of violence during the decade-long civil war, particularly compared with districts in the Mid- and Far-Western Regions of Nepal. The insurgency resulted in a total of 200 deaths in Chitwan district over a decade, while the number of deaths in some of the hardest hit districts reached over 900 (Informal Sector Service Center 2008). Chitwan thus offers a unique opportunity to study real-time migratory responses to relatively moderate levels of violence while controlling for a number of variables known to influence migration.

Our analysis is made possible by the existence of a representative survey of households in Western Chitwan that compiled detailed, multilevel data over the entire period of civil conflict, which we were able to combine with monthly data on civil violence not only in Chitwan but also in surrounding districts. The Chitwan Valley Family Study (CVFS) used a combination of ethnographic and survey methods to create a detailed database of social, economic, and demographic characteristics for individuals, households, and communities. For sampling purposes, the western portion of the valley was divided into a set of mutually exclusive neighborhoods of 5–15 households, and 171 neighborhoods were selected on an equal probability basis using multistage cluster sampling (Barber et al. 1997). The migration data come from a prospective monthly panel survey that began in February 1997 and ended in January 2006. Instead of the 171 original neighbor-hoods, however, only 151 were followed in the panel owing to budget constraints. Household members from these 151 neighborhoods were reinterviewed each month even if they left the sample neighborhood, except when the entire household moved outside of Nepal. The panel survey thus yields accurate monthly data on place of residence, age, ethnicity, gender, and marital status.

We pair this longitudinal data set with corresponding cross-sectional data sets compiled at the individual and household levels for 1996, thereby creating a comprehensive file that links individual migratory behavior both to fixed and time-varying independent variables defined at multiple levels. In our sample, we include only those 3,802 respondents between the ages of 15 and 69 who resided in the 151 neighborhoods at the outset of the panel survey in 1996. After we merged the different data sets, fewer than 2% of the person-months contained missing values for any variable in the analysis, leading us to discount missing data as a significant source of bias in our analyses. In order to measure violence from Nepal's civil conflict, we compiled monthly data on violence from the Maoist insurgency, relying on special data sets compiled by the South Asia Terrorism Portal (SATP) and the Informal Sector Service Center (INSEC). The data compiled by the SATP were downloaded directly from the group's website, whereas those from INSEC were entered manually from its yearly Human Rights Yearbooks. The former source kept monthly tallies of bomb blasts, landmine explosions, and major clashes between government and insurgent forces, along with the casualties from these various incidents, whereas the latter reported dates of Maoist violent events by district.

Both sources recorded incidents of violence only from January 2002 onward, however. Little information was collected between February 1997 and December 2001 because Maoist violence was not yet a countrywide phenomenon. The national spread of violence began with the declaration of a state of emergency by the Nepalese government at the end of 2001. Given that Maoist violence was at a very low level in more developed areas such as Chitwan prior to this declaration, here we assume values of zero for monthly indicators of violence between February 1997 and December 2001. We then matched monthly counts of violence with monthly data derived from the CVFS to create a comprehensive person-month file of individuals that ran from March 1997 through January 2006. The file was structured so that time-varying independent variables were defined in month t and mobility was observed in month t + 1. This person-month file was used to estimate a series of multinomial logit models predicting the likelihood of migration to three competing destinations: within Chitwan, outside of Chitwan but in Nepal, and outside Nepal.

Modeling Forced Migration

The literature on forced migration generally distinguishes between three kinds of determinants: root causes, proximate conditions, and intervening factors (see Clark 1989 and Schmeidl 1997). In Table 1, we classify our independent variables using these same rubrics along with demographic control variables. The outcome of interest is defined as 0 if no move was observed between month t and t+1; as 1 if a respondent moved to a different neighborhood in Chitwan; as 2 if he or she moved outside of Chitwan but within Nepal during this time; and as 3 if he or she left the country entirely. All person-months after the individual's first trip or survey date, whichever comes first, are excluded from the analyses, yielding a total of 232,669 person-months for our analyses. Our independent variables include time-varying factors defined in month t as well as factors fixed at the beginning of the observation period in 1996.

Using the aforementioned person-month file, we then estimated multinomial logit models to predict the effect of independent variables defined in month t or at the baseline on migration outcomes in month t+1. Before choosing the multinomial logit model for our analysis, we tested for one of the key assumptions of the multinomial logit model, which is the independence from irrelevant alternatives (IIA). The IIA requires that the odds of choosing alternative 1 over alternative 2 is not influenced by the presence of other alternatives. We used the Hausman test in Stata to confirm that the assumption holds. Among the four tests reported, three were negative. Based on Long and Freese (2006:244–45), we conclude that

these negative results offer sufficient evidence that IIA was not violated, which reinforces our decision to use the multinomial logit model. The model can thus be written as

$$\ln\left(\frac{p_{ij}(t+1)}{p_{i0}(t+1)}\right)=\beta_{0j}+\beta_{1j}X_{1i}(t)+\beta_{2j}X_{2i}(t)+\beta_{nj}X_{ni}+\varepsilon_{ij},$$

where i denotes individuals; j represents the three possible values for migration destinations 1, 2, and 3 versus 0, which is the reference category representing no migration; and t represents time period, which is month in our study. The multinomial regression produces separate regression equations for the three different migration destinations represented by j. The migration outcome is a nonlinear transformation of the natural logarithm of the predicted value of the odds or relative probability, $p/1-p$, of migrating to three competing destinations (j =1,2,or3) versus not migrating. β_{0j} is the constant, β_{1j} to β_{nj} represent the coefficients; ε_{ij} is the error term for individual i with migration outcome j; and finally, X_{1i} to X_{ni} represent the explanatory variables, which are grouped under four categories: proximate causes, root causes, intervening factors, and demographic variables.

Proximate Causes

The proximate cause of migration of central interest here is the intensity of violence during month t. Rational choice theory suggests that as the risk to physical safety rises with the intensity of violence, people will seek to reduce this risk by moving elsewhere (Edwards 2008). Although the theoretical literature is unanimous in predicting a positive relationship between violence and migration, Morrison (1993) found a threshold effect of violence such that low levels of violence had no effect on internal migration in Guatemala, but violence reaching a certain threshold level lead people to migrate. Also, Alvarado and Massey (2010) found that modest levels of violence may even deter migration if people seek to minimize risk by withdrawing to the home and limiting outside mobility. The presence of monthly data on violence and individual migration decisions over the entire period of the civil conflict enables us to put the threshold theory of violence to test, which we accomplish by expressing our violence indicator as a quadratic.

Owing to data limitations, most studies define the intensity of violence in terms of the number of reported deaths (see Alvarado and Massey 2010; Heger and Salehyan 2007; Lacina 2006; Schultz 1971; Stanley 1987). Here, however, we create a more comprehensive index based on six indicators of violence in Chitwan and its surrounding districts. This decision reflects our belief that violence in adjacent areas also influences decisions made in Chitwan. The bordering districts include Parsa, Makwanpur, Dhading, Gorkha, Tanahu, and Nawalparasi (see Fig. 1), and each of these also experienced moderate levels of violence during the insurgency. The six districts averaged 158 deaths from Maoist violence over the decade-long war, with the highest number of deaths recorded in Gorkha (259 deaths, compared with 200 in Chitwan—see Informal Sector Service Center 2008).

Our six measures of violence include the monthly number of bomb blasts in Chitwan; the number of bomb blasts in neighboring districts; the number of casualties from bomb blasts in Chitwan; the number of casualties from bomb blasts in neighboring districts; the number of casualties in Chitwan from major clashes between government and Maoist forces, major attacks by either party, and major landmine explosions; and the number of casualties in neighboring districts from major clashes between government and Maoist forces, major attacks by either party, and major landmine explosions.

Major clashes and attacks are defined as those resulting in more than two casualties. We use only those incidents leading to more than two casualties because our data on Maoist

violence rely significantly on media reporting. Although incidents resulting in larger numbers of deaths are recorded, those yielding just one or two casualties are not always clearly identifiable in some months. In some instances, lesser incidents of violence leading to one or two casualties are even missing. In order to be consistent, therefore, only those incidents with larger numbers of casualties are used in the data set. This approach makes sense because incidents resulting in higher casualties are more likely to be reported in the media and thus more likely to come to public attention where they can influence migration decisions, in contrast to lesser incidents of violence that may be overlooked or even ignored by the media.

We employed the factor analytic method of Sahn and Stifel (2000, 2003) to construct an index of insurgent violence using the principal components method. Since the indicators of violence were at different scales, we standardized them by conversion into z scores before weighting to create the final scale. The factor loadings associated the first factor, which explains 43% of the variance, provide the weights to compute the composite score. The top panel of Table 2 shows large factor loadings for the number of bomb blasts in Chitwan, the number of bomb blasts in neighboring districts, and the number of casualties from bomb blasts at each location. The number of casualties from major attacks, clashes, or landmines did not load as highly on the violence factor and are accordingly given less weight in the overall index.

Root Causes

The root causes of migration are generally hypothesized to be those associated with poverty and disadvantage (see Schmeidl 1997). Poverty, along with unemployment and low wages, yields economic hardships that prompt people to look elsewhere for material sustenance or advancement. Conventional economic theory suggests that access to physical capital helps mitigate the costs of migration and thus raises the likelihood of out-migration (Massey et al. 1998), whereas the new economics of labor migration holds that households move to self-finance the acquisition of assets, so that the possession of physical capital is associated with a lower likelihood of movement (see Massey and Espinosa 1997). In either case, ownership of physical capital should be controlled in studying how violence influences migration decisions. Among indicators of physical capital in our analysis, we consider ownership of farmland, goods, livestock, and amenities within the household in 1996. Ownership of farmland is indicated by a dichotomous variable, whereas access to other assets (goods, livestock, and household amenities) is indicated by the factor scales summarized in the second, third, and fourth panels of Table 2, which show factor loadings derived using principal components factor methods and applied as weights to z scores to compute the relevant scales.

The factor weights for household amenities, goods, and livestock all have expected signs. The weights are positive except for “no drinking water” and “no toilet,” which indicate lower physical capital relative to the reference category; the other variables represent higher levels of physical capital. Among household amenities, the type of materials used to build the roof and floor and the availability of electricity are assigned large weights, whereas lack of drinking water and toilet facilities have smaller weights. Similarly, among goods owned, slightly larger weights are placed on ownership of a biogas plant, TV, motorcycle, and radio compared with goods such as a pump for irrigation, cart, bicycle, and tractor. Finally, among livestock variables, ownership of sheep and goats, female buffaloes, bullocks, and cows carry relatively larger weights compared with ownership of chickens, ducks, pigeons, male buffaloes, and pigs.

Among the economic causes of migration, neoclassical economics places special emphasis on low wages, arguing that in the presence of geographic wage differentials, migrants will

move to maximize expected lifetime earnings (Todaro and Maruszko 1987). In contrast, the new economics of labor migration sees migration as tied to missing or imperfect markets for capital, futures, credit, and insurance rather than geographic differences in wages (Stark 1991). The latter model also views migration as a collective decision rather than an individual decision by which households send out migrants to diverse locations to minimize risk, accumulate capital, and overcome credit constraints.

Although we do not have data on wages or employment rates in origin and destination areas, we do have information on personal characteristics that are known to determine wages (Sjaastad 1962). We therefore introduce selected measures of human capital as control variables in our analysis of how violence influences migration. We measure education as years of school completed by 1996 (see Table 1). As a measure of occupational skill, we include a dummy variable indicating whether the respondent qualified for a salaried job in 1996, and age in years offers a proxy for labor force experience, with a squared term added to capture nonlinear curvature in the relationship.

Intervening Factors

The third category of influences on forced migration includes intervening factors, originally introduced by Lee (1966) in discussing voluntary migration and later applied by Clark (1989) to refugee migration. The existence of local alternatives to migration may vary seasonally and may act to increase or decrease the likelihood of departure (see Schmeidl 1997). The Nepalese economy relies heavily on agriculture, which employs 76% of the workforce. Local unemployment rates are often very high, and consequently there is a long tradition of seasonal migration in Nepal. Martinez (2002) estimated that 60%–80% of the male population in Western Nepal live away from home during the winter season, yielding a culture of seasonal movement for subsistence. We therefore control for potential seasonality in the risk of migration by specifying 11 monthly dummy variables.

Perhaps the most important intervening factor influencing the migration decision is *social capital*, a term coined by Loury in 1977 and expanded by Bourdieu in 1986 to refer to resources available through membership in social networks and organizations. A social tie to a current or former migrant constitutes a potential source of social capital because someone with migratory experience can provide information, resources, and assistance to lower the costs of movement of a potential migrant (Massey et al. 1998). In our analysis, we measure social capital by introducing three dummy variables to indicate whether the respondent had at least one member in his or her household who had, in 1996, migrated within Chitwan, to other districts in Nepal, or to other countries. Irrespective of the level of violence, we expect to observe strong destination-specific effects of social capital on migration, with ties to international migrants predicting international migration, ties to internal migrants predicting internal migration, and ties to local migrants predicting migration within Chitwan.

Demographic Variables

Finally, in our analysis, we hold constant the influence of demographic variables such as gender, marital status, household size, and ethnicity. Prior work has revealed significant ethnic differences in decision-making with respect to migratory outcomes (Bohra and Massey 2009). Therefore, we measure ethnicity by using dummy variables to indicate high-caste Hindus, low-caste Hindus, Hill Tibeto-Burmese, Newar, and other, leaving the Terai Tibeto-Burmese as the reference category. The Terai Tibeto-Burmese are the local indigenous people of the Chitwan Valley, and if prior migratory experience yields migration-related human and social capital, then other groups should be more likely to possess such resources than the Terai Tibeto-Burmese. We also introduce a control for gender and another for marital status of respondents. Given the patrilocal family structure in

Chitwan, women's moves are more likely to be related to marriage. We therefore also introduce an interaction term between marital status and gender.

Descriptive Statistics

Table 3 presents means, standard deviations, and ranges for the measures used to create composite indicators of violence and physical capital. During the 108 months of civil conflict that we consider, there were 0 to 3 bomb blasts per month in Chitwan, with an average of 0.2 blasts per month. There were 0 to 5 casualties from bomb blasts each month, with an average of 0.21 casualties per month. The number of casualties from major attacks in Chitwan ranged from 0 to 38 per month, with an average of 0.53. Similarly, in neighboring districts, the number of bomb blasts per month ranged from 0 to 9, with 0.8 blasts in a typical month; the monthly casualties from bomb blasts ranged from 0 to 12, with 0.75 casualties per month, on average; and the number of casualties from major attacks ranged from 0 to 86 per month, with an average of 3.0.

In terms of physical capital, 80% of the households to which respondents belonged owned farmland. As for household amenities, 49% of respondent households had a roof made of slate, tin, or concrete; only 25% had a floor made of concrete. These materials represent better quality than materials such as straw to thatch the roof or mud, brick, or wood for the floor. Higher-quality materials are not generally affordable to poor households and thus indicate a higher socioeconomic status. On average, 46% of respondent households did not have their own source of drinking water, while 36% had no toilet, and 66% had no electricity. Among the goods owned by households, 52% had a radio and 62% had a bicycle, but only 12% had a TV and just 3% had a motorcycle; 7% reported owning a cart, 5% owned a biogas plant, and just 1% and 3% had a tractor or an irrigation pump, respectively. The average household owned 20.2 chickens and ducks, 1.15 pigeons, 0.57 bullocks, 0.36 cows, 0.16 male buffaloes, 1.25 female buffaloes, 1.46 sheep and goats, and 0.06 pigs.

As already mentioned, these variables were used to create the factor scales of violence (under proximate causes) and physical capital (under root causes), with each index standardized for ease of interpretation with a mean of 0 and variance of 1. Table 4 presents means, standard deviations, and ranges for predictors of migration and counts for migration to different destinations. Education, which is a measure of human capital, is generally quite low. Although years of schooling ranged from 0 to 16 in the typical person-month under observation, it averaged only 3.1 years. Another measure of human capital is whether the respondent held a salaried job in1996, but in only 5.3% of person-months did respondents hold such a job as of 1996. Age is another measure of human capital, and in the average month when respondents were exposed to the risk of migrating, the typical person was 39.5 years old, though people ranged in age from 15 to 69 years. From the statistics on social capital, we see that in the average person-month, around 6.3% of all respondents had at least one household member who had migrated within Chitwan by 1996, another 8.8% had someone who had migrated to other districts within Nepal, and 9.7% had someone with international experience.

The distribution of person-months was fairly equal by calendar month, with 7% of the months observed being January, each month from February to June being close to 9%, and each month from July to December was around 8%. Among demographic variables, 59% of the person-months at risk of migration were lived by females, and a very high proportion (87%) were lived by people who had been married at least once. Although the average household size stood at 6.7 people, the number of household members varied from 1 to 26 persons. Finally, in keeping with the rough ethnic composition of the Chitwan Valley, in person-months leading up to the end of the survey, the largest share of respondents were

upper-caste Hindus (46.3%), followed by Terai Tibeto-Burmese (the original inhabitants of the Valley; 23.2%), Hill Tibeto-Burmese (13.6%), lower-caste Hindus (10.1%), and Newar and other caste (6.9%). Thus, most residents of Chitwan either migrated in from outside the Valley or are descendents of those who did.

Effect of Violence on Migration

As described earlier, we followed respondents monthly from March 1997 up to their first trip or the end of the survey date. We defined independent variables as time-varying in month t or fixed in 1996 and used them to predict migration in month t + 1. Table 5 presents the results of a multinomial logit regression estimated to measure the effect of violence in Chitwan and surrounding districts on decisions to out-migrate from Chitwan to three possible destinations while controlling for relevant individual and household characteristics. Our data are nested because we include variables measured at the individual as well as household levels. Each household could contribute multiple members to the analysis, and members of the same household are likely to share many similar traits, which can influence their probability of migration. This possible correlation among household members violates the assumption of independence of observations. The intraclass correlation can lead to underreporting of standard errors of coefficients. We therefore adjust for clustering of households in our regressions and report the results using adjusted standard errors and thus correct tests of significance.

Prior work has generally hypothesized and found a strong positive connection between violence and migration, though at least one study has uncovered threshold effects of violence (Morrison 1993) and another study found that low levels of violence may negatively influence the odds of movement (Alvarado and Massey 2010). In order to test the threshold hypothesis systematically, we introduced a squared term for violence to capture the nonlinearity. As can be seen in Table 5, both the violence scale and its square are highly significant in predicting migration, indicating a curvilinear relationship. Whereas the main effect of the violence scale is strongly negative, its square is strongly positive, which means that, controlling for other relevant determinants, violence lowers the odds of out-migration to all three destinations up to a certain point, after which it increases the odds of out-migration. The effect of violence on migration also seems to rise as the distance of the move increases, such that violence has the most profound effect on migration to international destinations, followed by migration to other districts, and then local migration within Chitwan.

In order to see directly how violence influences the likelihood of local, internal, and international migration, we used the data shown in Table 5 to generate predicted probabilities of movement to each destination. Specifically, we varied the violence scale from the observed minimum to the observed maximum and applied the associated coefficients for violence and its square while applying other coefficients to mean values of the associated variables. As can be seen in Fig. 2, violence is most influential in suppressing international migration and less influential in suppressing internal migration to other districts in Nepal. The probability of international migration drops to near zero at even low levels of violence, whereas the likelihood of internal migration drops to near zero at moderate levels of violence, and the odds of moving to either destination remain near zero over the entire range of violence observed in Chitwan and surrounding districts. The probability of migration within Chitwan is greater no matter what the level of violence, but rising violence also has the effect of suppressing local mobility as it goes from low to moderate levels. Unlike the situation with internal and international moves, however, as violence rises into the high range, it eventually begins to increase the odds of making a local move.

Thus, at the levels observed in and around Chitwan, violence served to lower the odds of internal and international migration but had a curvilinear effect on local mobility, reducing the likelihood of moving within Chitwan at low to moderate levels but increasing the probability of mobility within Chitwan as it approached high levels. Because we were forced to assume that the level of violence stood at zero before 2002—owing to the lack of published data—we reestimated the model using person-months after this date to make sure that our conclusion was not an artifact of this assumption. The reanalysis yielded the same curvilinear effects, confirming the validity of our findings.

Other independent variables in the model generally display effects that are consistent with prior theory and research. Like Massey and Espinosa (1997), we find that ownership of physical capital generally reduces the odds of migration. Ownership of farmland, for example, significantly reduces the odds of moving within Chitwan and to other districts in Nepal, although it increases the odds of international migration (see Table 5). Similarly, access to household amenities significantly lowers the odds of moving within Chitwan. The effects of human capital are generally positive, with education and occupational skill increasing the likelihood of movement to all three destinations (though the effect of occupational skill is not significant in predicting international migration). As expected, social capital evinces strong place-specific effects on mobility, with ties to local movers predicting migration within Chitwan, ties to internal migrants most strongly predicting migration to other districts in Nepal, and ties to international migrants strongly predicting emigration outside the country. Unlike the results of many studies of migration, however, age generally had a decelerating negative effect on the likelihood of migration irrespective of destination: as respondents aged, they slowly grew less likely to migrate. Although this unusual pattern could reflect the absence of households that left Nepal without returning, the same effect has been observed in other studies of migration that used retrospective data from Chitwan and that were not subject to this potential bias (Bohra and Massey 2009;Massey etal. 2010).

Schmeidl (1997) identified seasonality as an important intervening factor that can play a significant role in increasing or decreasing refugee migration, and the dummy variables for month do indeed reveal distinct patterns of seasonal migration for different kinds of moves. Compared with December, within-Chitwan migration is elevated during all months except January, September, and October; migration to other districts in Nepal is less likely to occur in January but more likely to occur in February; and departures for international destinations are most likely to occur in February, March, and November.

In terms of personal demography, the effects of gender and marriage are complicated by a significant interaction that stems from the Nepalese practice of patrilocal residence following marriage. Among males, the effect of marriage on migration is simple: it raises the odds of moving within Chitwan by 68% ($e^{(0.516)} = 1.675$) and increases the odds of moving internationally by 82% ($e^{(0.597)} = 1.817$). In contrast, whereas unmarried women are always less likely to migrate than unmarried men, because of the interaction between gender and marriage, married women are more likely than unmarried men to move locally and internally, though not internationally. Compared with a single man, for example, a single woman is 24% less likely to move within Chitwan ($1 - e(-0.271) = 0.237$), 34% less likely to move to another district in Nepal($1 - e^{(-0.408)} = 0.335$), and 95% less likely to move outside of Nepal($1 - e^{(-2.949)} = 0.948$); but a married woman is 67% more likely to move within Chitwan than a single man ($e^{(-0.271+0.516+0.269)} = 1.672$) and 29% more likely to move elsewhere in Nepal ($e^{(-0.408+0.067+0.597)} = 1.292$). A married woman is still much less likely than a single man to move internationally, with the odds being 73% lower ($1 - e^{(-2.949+0.597+1.028)} = 0.734$).

Another demographic variable, rising household size, decreases the odds of leaving Chitwan for other districts and other countries. Each additional person in the household lowers the odds of migrating to other districts by around 4% ($1 - e^{-.045} = 0.044$) and to other countries by 12% ($1 - e^{-.13} = 0.122$). Finally, in terms of caste, Hindus and Hill Tibeto-Burmese are far more likely to move internationally than other groups, and the Hill Tibeto-Burmese seem to be the most mobile, with an elevated risk of migration to all three destinations. Thus, consistent with the earlier results of Bohra and Massey (2009), those who belong to ethnic groups with prior migratory experience are more likely to migrate than Terai Tibeto-Burmese, the indigenous people of the Chitwan Valley, whatever the level of violence.

As a follow-up to the analysis of Table 5, we estimated another set of regressions that introduced interaction terms between violence and each of the root causes and demographic factors to see whether variables affected migration differently in the presence of violence (results supplied on request). Given the small number of respondents who left Nepal, however, we had to collapse migratory categories two and three into a single category for migration outside of Chitwan, including both internal and international migrants. We did not find any interaction effects at conventional levels of significance, thus allowing us to conclude that standard predictors of migration do not affect decisions to migrate differently in the presence of violence.

Summary and Conclusion

With this article, we sought to improve on prior studies of the relationship between civil violence and migration in several ways. First, we developed a more comprehensive model that allowed us simultaneously to assess the effects of individual as well as household characteristics and to estimate their effects dynamically using longitudinal rather than cross-sectional data. Specifically, we estimated a series of multilevel discrete-time event history analyses that incorporated both fixed and time-varying effects. Second, we were able to define a more comprehensive and reliable index of civil violence than earlier studies by including not just counts of deaths within the home district, but also the number of bomb blasts and major conflicts and casualties from these, both in the home district as well as in all surrounding districts.

Third, we were able to measure the independent effect of violence on the decision to migrate locally, internally, and internationally. So far, the literature on forced migration has tended either to study movement to one destination at a time or to lump all destinations together. We found that the effect of violence on the likelihood of migration was different for different destinations, increasing as the distance of the move increased. the effect of violence was weak in the case of local moves, stronger for moves outside of Chitwan, and the strongest for international moves. Fourth, we specified a more complex model of individual decision-making that estimated the effects of violence while controlling for leading predictors of voluntary migration, which we found influenced migration whatever the level of civil violence. Interactive models found that effects of any of the predictors of migration did not significantly vary by the level of violence.

Finally, our results are novel in showing that civil violence affects migration differently at different levels of intensity. Whereas most prior work has found a positive effect of violence on out-migration, our results are consistent with those few studies that have either found violence to have no influence on migration below a certain threshold or to reduce the likelihood of movement at low to moderate levels. We found a curvilinear effect of violence on decisions to migrate to all three destinations such that the odds of out-migration were reduced at low to moderate levels of violence and only increased as violence approached high levels. Inspection of predicted probabilities indicates that at the modest levels of

violence observed in and around Chitwan, approaching the maximum observed there only increased the odds of making local moves but had no practical influence in raising the odds of internal or international moves. Of course, the higher levels of violence observed in other districts of Nepal could well be great enough to raise the probability of moving internally and internationally as well.

In sum, our results thus support a threshold theory of migration and violence. Apparently, only in situations characterized by high levels of violence do people see no option but leaving. Under conditions of extreme violence, threats to safety are perceived to exceed the risks of travel to a new and unfamiliar destination. At lower levels of violence, however, the risks of movement outweigh those associated with staying home for a variety of reasons. First, levels of violence may be much higher in other parts of the country, and by staying home, people avoid elevated risks elsewhere. Second, actions taken by insurgents and the state often create unsafe traveling conditions owing to a proliferation of strikes, protests, blockades, security checks, curfews, and roadblocks. Third, civil conflict is often associated with a breakdown of formal authority, creating a dangerous public sphere through which people must travel, one in which robbery, looting, assault, kidnapping, and other violations are common. For these reasons, unless violence reaches certain levels, people are more likely to confine themselves to the safety of their homes, family networks, and surroundings they know and trust.

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Fig. 1.

istribution of human development index across districts. Source: Nepal South Asia Centre (1999). Nepal Human Development Report 1998 (Submitted to the United Nations Development Programme, Nepal), Kathmandu, Nepal

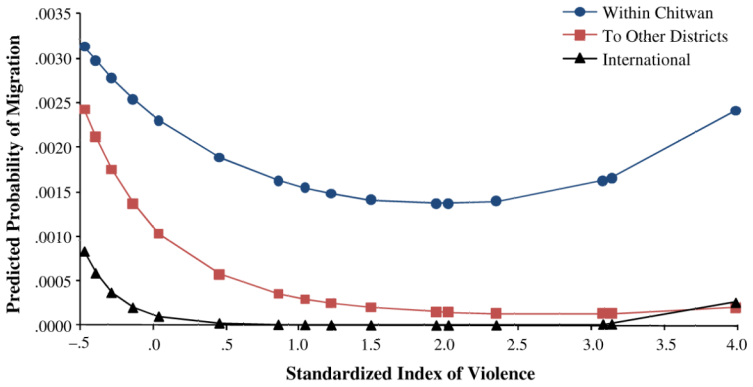

Fig. 2.
redicted probability of migration by level of violence

Table 1

Definition of variables

Variable	Definition
Outcome Variables	
Migration to three competing locations	Whether respondent migrates in month $t + 1$: migrates within Chitwan = 1, migrates to other districts = 2, migrates to other countries=3, or doesn't migrate at all in month $t + 1 = 0$.
Migration to two competing locations	Whether respondent migrates in month $t + 1$: migrates within Chitwan = 1, migrates to other districts or other countries = 2, or doesn't migrate at all in month $t + 1$.
Proximate Causes	
Standardized index of violence	Derived through factor analysis using six indicators of violence: number of bomb blasts, number of casualties from bomb blasts, and number of casualties from major incidents of violence.[a] All variables are measured for Chitwan and the surrounding districts separately.
Root Causes	
Physical capital	
Owns farmland	1 if respondent's household owns farmland, 0 otherwise.
Standardized index of household amenities	Derived through factor analysis using data on the materials used to build the floor and roof of the respondent's house; and whether household has a toilet, access to own drinking water source, and electricity.
Standardized index of goods owned	Derived through factor analysis using data on durables owned by the household: a radio, TV, bicycle, motorcycle, cart, tractor, pumpset, and biogas plant.
Standardized index of livestock owned	Derived through factor analysis using data on number of chicken, pigeons, bullocks, buffalo, cows, sheep, goats, and pigs owned by the household.
Human capital	
Education	Number of years of schooling completed by the respondent.
Salary job	1 if respondent holds a salary job, 0 otherwise.
Age	Respondent's age, monthly event.
Age squared	Respondent's age squared, monthly event.
Intervening Factors	
Social capital	
House member migrated within Chitwan	If any member from the respondent's household migrated within Chitwan in 1996, 0 otherwise.
House member migrated to other districts	If any member from the respondent's household migrated to other districts in 1996, 0 otherwise.
House member an international migrant	If any member from the respondent's household migrated to other countries in 1996, 0 otherwise.
Demographic Variables	
Female	1 if respondent is a female, 0 otherwise.
Married	1 if respondent was ever married, 0 otherwise, monthly event.
Number of household members	Number of people in the household as of 1996.
Ethnicity	
Hindu upper caste	1 if Hindu upper caste, 0 otherwise.
Hindu lower caste	1 if Hindu lower caste, 0 otherwise.
Hill Tibeto-Burmese	1 if Hill Tibeto-Burmese caste, 0 otherwise.

Variable	Definition
Newar and other	1 if Newar or other caste, 0 otherwise.
Terai Tibeto-Burmese	1 if Terai Tibeto-Burmese caste, 0 otherwise.

Note: All variables except monthly events were measured in 1996

[a] Incidents of violence between government and Maoist forces such as major clashes, major attacks by either party, and major landmine explosions resulting in more than two casualties

Table 2

Index weights for the composite index of violence and physical capital variables

	Index Weights
Violence Variables	
Chitwan and neighboring districts violence	
Number of bomb blast in Chitwan	0.331
Number of casualties from bomb blasts in Chitwan	0.253
Number of casualties from major attacks in Chitwan[a]	0.013
Number of bomb blasts in neighboring districts	0.318
Number of casualties from bomb blasts in neighboring districts	0.294
Number of casualties from major attacks in neighboring districts[a]	0.159
Variance explained by first factor	0.431
Physical Capital Variables	
Household amenities	
Roof of house is made of slate, tin, or concrete	0.268
Floor of house is made of concrete	0.262
Does not have own drinking water source	−0.214
No toilet	−0.217
Has electricity	0.242
Variance explained by first factor	0.687
Goods owned	
Household has a radio	0.190
Household has a TV	0.198
Household has a bicycle	0.184
Household has a motorcycle	0.200
Household has a cart	0.165
Household has a tractor	0.184
Household has a pumpset for irrigation	0.135
Household has a biogas plant	0.210
Variance explained by first factor	0.459
Livestock owned	
Number of chickens and ducks	0.081
Number of pigeons	0.237
Number of bullocks	0.300
Number of cows	0.271
Number of male buffaloes	0.211
Number of female buffaloes	0.328
Number of sheep and goats	0.422
Number of pigs	0.141
Variance explained by first factor	0.217

[a]Major attacks refer to clashes between the Maoists and the state, major attacks by either party, and major landmine explosions resulting in more than two casualties

Table 3

Descriptive statistics for the measures used to create composite index of violence and physical capital

	Count	Min.	Max.	SD	Mean
Proximate Causes					
Chitwan and neighboring districts violence					
Number of bomb blast in Chitwan	108	0	3	0.592	0.204
Number of casualties from bomb blasts in Chitwan	108	0	5	0.798	0.213
Number of casualties from major attacks in Chitwan[a]	108	0	38	3.740	0.528
Number of bomb blasts in neighboring districts	108	0	9	1.792	0.796
Number of casualties from bomb blasts in neighboring districts	108	0	12	2.259	0.750
Number of casualties from major attacks in neighboring districts[a]	108	0	86	10.325	3.000
Root Causes					
Physical capital					
Household amenities					
Roof of house is made of slate, tin, or concrete	1,391	0	1	0.500	0.491
Floor of house is made of concrete	1,391	0	1	0.430	0.245
Does not have own drinking water source	1,391	0	1	0.498	0.455
No toilet	1,391	0	1	0.480	0.361
Has electricity	1,391	0	1	0.475	0.342
Goods owned					
Household has a radio	1,391	0	1	0.500	0.523
Household has a TV	1,391	0	1	0.329	0.124
Household has a bicycle	1,391	0	1	0.485	0.624
Household has a motorcycle	1,391	0	1	0.175	0.032
Household has a cart	1,391	0	1	0.260	0.073
Household has a tractor	1,391	0	1	0.089	0.008
Household has a pumpset for irrigation	1,391	0	1	0.179	0.033
Household has a biogas plant	1,391	0	1	0.208	0.045
Livestock owned					
Number of chickens and ducks	1,391	0	2,210	121.637	20.160
Number of pigeons	1,391	0	150	7.013	1.154

	Count	Min.	Max.	SD	Mean
Number of bullocks	1,391	0	7	0.944	0.565
Number of cows	1,391	0	8	0.911	0.355
Number of male buffaloes	1,391	0	4	0.508	0.156
Number of female buffaloes	1,391	0	8	1.347	1.247
Number of sheep and goats	1,391	0	24	1.982	1.460
Number of pigs	1,391	0	8	0.354	0.060

[a]Major attacks refer to clashes between the Maoists and the state, major attacks by either party, and major landmine explosions resulting in more than two casualties

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Table 4

Descriptive statistics for the dependent and independent variables

	Count	Min.	Max.	SD	Mean
Outcome Variables					
Migration to within Chitwan locations	980				
Migration to other districts	643				
Migration to other countries	210				
Proximate Causes					
Standardized index of violence	108	−0.469	3.985	1	0
Squared of standardized index of violence	108	0.001	15.883	2.409	0.991
Root Causes					
Physical capital					
Owns farmland	1,391	0	1	0.399	0.802
Standardized index of household amenities	1,391	−1.177	1.804	1	0
Standardized index of goods owned	1,391	−1.220	4.744	1	0
Standardized index of livestock owned	1,391	−1.040	10.116	1	0
Human capital					
Education	232,669	0	16	4.038	3.144
Salary job	232,669	0	1	0.224	0.053
Age	232,669	15	69	13.235	39.464
Age squared	232,669	225	4,761	1,079.205	1,732.589
Intervening Factors					
Social capital					
House member migrated within Chitwan	232,669	0	1	0.243	0.063
House member migrated to other districts	232,669	0	1	0.283	0.088
House member an international migrant	232,669	0	1	0.296	0.097
Months					
January	232,669	0	1	0.261	0.073
February	232,669	0	1	0.285	0.089
March	232,669	0	1	0.283	0.088
April	232,669	0	1	0.281	0.087
May	232,669	0	1	0.280	0.085

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	Count	Min.	Max.	SD	Mean
June	232,669	0	1	0.278	0.085
July	232,669	0	1	0.277	0.084
August	232,669	0	1	0.276	0.083
September	232,669	0	1	0.275	0.082
October	232,669	0	1	0.274	0.082
November	232,669	0	1	0.274	0.081
December	232,669	0	1	0.272	0.081
Demographic Variables					
Female	232,669	0	1	0.491	0.592
Married	232,669	0	1	0.335	0.871
Female × married	232,669	0	1	0.500	0.519
Number of household members	232,669	1	26	3.507	6.677
Ethnicity					
Hindu upper caste	232,669	0	1	0.499	0.463
Hindu lower caste	232,669	0	1	0.301	0.101
Hill Tibeto-Burmese	232,669	0	1	0.342	0.136
Newar and other	232,669	0	1	0.254	0.069
Terai Tibeto-Burmese	232,669	0	1	0.422	0.232

Table 5

Multinomial logistic regression output for predicting the competing risks of taking the first trip to one of three competing locations in month t+1

	Within Chitwan		To Other Districts		To Other Countries	
Independent Variables in Month *t*	**B**	**SE**	**B**	**SE**	**B**	**SE**
Proximate Causes						
Standardized index of violence	−0.552**	(0.175)	−1.567**	(0.407)	−3.689*	(1.744)
Squared of standardized index of violence	0.140*	(0.063)	0.286*	(0.133)	0.974*	(0.442)
Root Causes						
Physical capital						
Owns farmland	−0.531**	(0.123)	−0.438**	(0.141)	0.582*	(0.291)
Standardized index of household amenities	−0.139*	(0.064)	−0.049	(0.067)	−0.188	(0.117)
Standardized index of goods owned	−0.010	(0.059)	0.061	(0.059)	0.150	(0.106)
Standardized index of livestock owned	−0.077	(0.052)	0.039	(0.053)	−0.066	(0.091)
Human capital						
Education	0.038**	(0.013)	0.069**	(0.016)	0.056*	(0.025)
Salary job	0.666**	(0.145)	0.661**	(0.160)	0.090	(0.275)
Age	−0.200**	(0.020)	−0.185**	(0.023)	−0.166**	(0.044)
Age squared	0.002**	(0.000)	0.002**	(0.000)	0.001*	(0.001)
Intervening Factors						
Social capital						
House member migrated within Chitwan	0.327†	(0.176)	0.121	(0.195)	0.430	(0.373)
House member migrated to other districts	0.133	(0.148)	0.855**	(0.147)	0.486*	(0.248)
House member an international migrant	−0.140	(0.144)	0.222	(0.165)	1.597**	(0.225)
Months						
January	0.240	(0.248)	−0.542*	(0.272)	−0.915	(0.593)
February	1.069**	(0.207)	0.447*	(0.197)	0.945**	(0.360)
March	0.800**	(0.223)	−0.012	(0.207)	0.897*	(0.366)
April	0.809**	(0.219)	0.146	(0.198)	0.589	(0.389)
May	0.774**	(0.222)	0.126	(0.202)	0.357	(0.409)

	Within Chitwan		To Other Districts		To Other Countries	
Independent Variables in Month *t*	**B**	**SE**	**B**	**SE**	**B**	**SE**
June	0.523*	(0.221)	0.123	(0.210)	0.240	(0.409)
July	0.862**	(0.219)	−0.047	(0.223)	0.469	(0.395)
August	0.751**	(0.217)	−0.006	(0.213)	0.084	(0.445)
September	−0.146	(0.270)	−0.103	(0.235)	−0.167	(0.461)
October	0.303	(0.244)	−0.026	(0.222)	0.539	(0.408)
November	0.521*	(0.234)	−0.082	(0.212)	0.814*	(0.391)
December	—	—	—	—	—	—
Demographic Variables						
Female	−0.271*	(0.138)	−0.408**	(0.153)	−2.949**	(0.513)
Married	0.516**	(0.158)	0.067	(0.196)	0.597*	(0.258)
Female × married	0.269†	(0.162)	0.597**	(0.187)	1.028†	(0.557)
Number of household members	−0.017	(0.020)	−0.045*	(0.020)	−0.130**	(0.049)
Ethnicity						
Hindu upper caste	0.167	(0.139)	0.326†	(0.175)	0.801**	(0.274)
Hindu lower caste	0.043	(0.188)	0.361	(0.225)	0.864**	(0.304)
Hill Tibeto-Burmese	0.498**	(0.150)	0.660**	(0.199)	0.710*	(0.298)
Newar and other	−0.004	(0.235)	0.345	(0.246)	−0.089	(0.465)
Terai Tibeto-Burmese	—	—	—	—	—	–
Constant	−2.197**	(0.423)	−3.010**	(0.487)	−5.980**	(1.280)
Likelihood Ratio Chi-Square (df = 96)			1,911.34**			
No. of person-months			232,669			

†$p < .10$;

*$p < .05$;

**$p < .01$