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Mixed and Complex Mixed Migration during Armed Conflict: Multidimensional Empirical Evidence from Nepal

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Abstract

Historically, legal, policy, and academic communities largely ascribed to a dichotomy between forced and voluntary migration, creating a black and white vision that was convenient for legal and policy purposes. More recently, discussions have begun addressing the possibility of mixed migration, acknowledging that there is likely a wide continuum between forced and voluntary, and most migrants likely move with some amount of compulsion and some volition, even during armed conflict. While the mixed migration hypothesis is well-received, empirical evidence is disparate and somewhat blunt at this point. In this article, I contribute a direct theoretical and causal pathway discussion of mixed migration. I also propose the complex mixed migration hypothesis, which argues that not only do non-conflict related factors influence migration during conflict, but they do so differently than during periods of relative peace. I empirically test both hypotheses in the context of the recent armed conflict in Nepal. Using detailed survey data and event history models, results provide strong evidence for both mixed migration and complex mixed migration during conflict hypotheses. These hypotheses and evidence suggest that armed conflict might have substantial impacts on long-term population growth and change, with significant relevance in both academic and policy spheres.

Keywords

migration; mixed migration; armed conflict; Nepal

Introduction

The literature on human movement has a long history of being separated into studies of migration that is forced during armed conflict, and migration that is voluntary, or for economic reasons, during periods of relative peace. Indeed, so black and white was the perception that legal and policy frameworks were developed and remain entirely dependent on the conception that forced and voluntary, or economic and political, are entirely different and mutually exclusive categories of migration (Crush, Tiwanda, and Tawodzera 2012; Van Hear 2009). However, the last two decades have seen increased questioning of this dichotomous perception of migration and the introduction of terms like "mixed migration"

and the "migration-asylum nexus" (Richmond 1993; Van Hear 1998; Van Hear 2009). These terms are intended to describe, and advocate, that there is a large continuum between entirely forced and entirely voluntary migration, and that most migrants move with some volition and some compulsion at the same time. In the language of causal analysis, the mixed migration hypothesis suggests that both conflict-related factors and non-conflict related factors influence migration during armed conflict. This idea has gained traction as shown by some qualitative and quantitative evidence to suggest this is the case during armed conflicts in areas as disparate as Lebanon, Guatemala, Nepal, El Salvador, Nicaragua, Somalia, Ethiopia, Mexico, Sri Lanka, Afghanistan, Albania, and much of Sub-Saharan Africa (Boehm 2011; Bohra-Mishra and Massey 2011; Crush et al. 2012; de Haas 2006; Jones 1989; Jureidini 2010; Khawaja, Assaf, and Yamout 2011; Lindley 2010; Lundquist and Massey 2005; Morrison and May 1994; Van Hear 2009; Vulltenari 2012; Williams et al. 2012; Williams 2013). These studies are published in different areas of the academic literature, and many of them provide indirect evidence or just suggestion of mixed migration. The result is that despite general academic agreement that it occurs, there is no consolidated or strong body of evidence to support the mixed migration hypothesis, nor are the mechanisms or processes that characterize it well understood. Thus it is not surprising to find reluctance on the part of international organizations to embrace this concept, especially given that it would change the nature of their work and refugee protection regimes (Crush et al. 2012; Van Hear 2009).

This article is a direct theoretical and empirical examination of the mixed migration hypothesis. In addition, I introduce and test the concept of *complex mixed migration*. The complex mixed migration hypothesis suggests that not only do non-conflict related factors influence migration during armed conflict, but that the influence of such factors is different during a conflict compared to before it. Not just an academic exercise, the implications of complex mixed migration are potentially great. The hypothesis suggests that armed conflict can change migration patterns; in other words, different people will migrate and not migrate during a conflict than would otherwise have done so. Given that personal migration experience and social norms are amongst the strongest predictors of the likelihood of migration (Curran et al. 2005; de Jong 2000; Massey 1990; Osella and Osella 2000), changes to migration patterns during armed conflict could persist well into the future. Consequently, armed conflict could substantially alter long-term migration patterns and their impact on population growth and change well beyond the cessation of a conflict. The complex mixed migration hypothesis can help us to better understand the nature and possible implications of these significant demographic changes. Thus, this study and the complex mixed migration hypothesis have substantial relevance to policy as well as demographic theory.

In an effort to advance the study of mixed migration during armed conflict and as an initial direct test of the complex mixed migration hypothesis, this article contributes a quantitative empirical analysis of migration patterns in the Chitwan Valley of Nepal during the Maoist-Government conflict from 1996-2006. In addition to exceptionally detailed survey data, this area was characterized by dramatic changes in the progression of armed conflict, including significant variation in the intensity of the violence, types of violent and political events, and

accessibility of social and economic services. This provides an excellent opportunity to examine how the influence of non-conflict-related factors changed in non-linear ways during the progression of events and changes that comprised this armed conflict. I specifically focus on non-economic determinants of migration which adds depth to the existing suggestive studies of mixed migration that primarily use economic factors (Lundquist and Massey 2005; Morrison and May 1994). In addition, the factors on which I focus (such as age, gender, and migration experience) are some of the strongest, most consistent influences on migration worldwide. Thus we might expect that they would be most resistant to change. Indeed, if the influence of these factors on migration is different during a conflict, as my results show in Nepal, this suggests that armed conflict has pervasive and far-reaching effects on social life, migration patterns, and demographic change.

Results of this study show that several social and demographic factors influenced migration in different ways before and during the armed conflict in Nepal. The key conclusions from this article are that mixed migration and complex mixed migration certainly did occur during the Nepali conflict and that it was a complicated, multi-dimensional and non-linear process that varied with violence intensity, political events, and accessibility to social and economic services. The strong evidence provided in this case suggests that similar studies in other situations of conflict should be a high scientific priority in order to advance our understanding of how armed conflict might influence long-term demographic change.

Background and Theoretical Framework

The conventional assumption that implicitly underlies many studies of migration during armed conflict is that conflict (or seeking safety from violence) is the only factor that affects migration decision-making during periods of generalized violence. This assumption is shown in a causal pathway diagram in Figure 1a. The idea of mixed migration, which proposes that factors besides violence such as community context and individual and household characteristics, might affect migration during armed conflict, first appeared in the late 1980s and 1990s (Richmond 1988, 1993; Van Hear 1998). The causal pathway behind this concept is shown with the solid lines in Figure 1b. From this time, we also find a series of papers attempting to determine if migration from certain areas (especially Central American countries) was for economic or political (i.e. seeking safety) purposes. In one study of Salvadoran migration to the US during the early 1980s, Stanley found no effect of employment availability (as a broad economic indicator) on aggregate migration trends (Stanley 1987). As with any quantitative study, it is unclear if there were no effects of economic factors, or if the measurement strategy Stanley used did not uncover existing effects. Since that initial study, results show that both economic and political factors influenced migration at the same time, in Guatemala, Nicaragua, and Colombia (Engel and Ibanez 2007; Ibanez and Velez 2008; Lundquist and Massey 2005; Morrison and May 1994), but only the Lundquist and Massey study uses a micro-level systematically selected, representative sample. Although these studies do not state it as such, they comprise the first quantitative empirical evidence for the mixed migration hypothesis. This came at a time when economic factors were given primacy in our understanding of motivations for migration, so it is not surprising to find mixed migration ideas expressed as pitting political against economic factors. Regardless, the addition of a political (or violence and safety)

consideration was a key contribution toward delving into the complexity of migration decision-making.

Since that time however, the general migration literature has embraced a much more complex perspective on decision-making, incorporating ideas about social norms, life course trajectories, and family obligations that explain how demographic (and not inherently economic) factors influence migration, such as age, gender, marital status, personal migration experience, and migration-specific capital (Curran et al. 2005; Donato et al. 2006; Fan and Huan 1998; Garip 2008; Korinek, Entwisle, and Jampaklay 2005; Massey 1990; Massey et al. 1987). It is following these multi-dimensional contributions that the concept of mixed migration during armed conflict has gained more traction in the literature (Crush et al. 2012; Van Hear 2009). Thus, while previous work pitted economic against political motivations, and found that both were significant, current mixed migration theory suggests that in addition to political considerations (i.e. violence and safety), many other factors (including economic and non-economic) might be important considerations in migration decisions and behaviors during armed conflict. Although there are few direct tests of the mixed migration hypothesis, several empirical studies of migration during armed conflict show that factors like age, gender, access to community services, and others have statistically significant influences on migration during armed conflicts in Nepal, Lebanon, and Colombia and during different periods that experienced varying levels of violence in Zimbabwe (Bohra-Mishra and Massey 2011; Crush et al. 2012; Engel and Ibanez 2007; Ibanez and Velez 2008; Williams et al. 2012; Williams 2013). As before, analytical methods vary for these studies and not all of them use representative samples or direct statistical tests of the mixed migration hypothesis. Explanation for the mixed migration hypothesis, which is often implicit and not clearly stated, is that even during periods of intense violence, individuals and households need and/or desire to continue with daily life, including work, school, family care, social interaction, and other routines. Similarly, social networks and norms will also likely function to influence behavioral decision-making during conflict. Thus we can expect economic, social, and demographic factors to influence migration during armed conflict. This is largely where the theory and evidence for mixed migration during conflict ends in the literature, with a proposition that non-conflict factors are important during conflict, but little direct empirical testing or additional theoretical work.

Adding to this foundation, I propose the complex mixed migration hypothesis. This builds on the mixed migration hypothesis, but also argues that social, economic, and demographic factors will influence migration differently during a period of conflict compared to before violence erupted. In other words, conflict will alter not just overall migration rates, but also the composition of migration streams or what kinds of people migrate. As shown in Figure 1b, there are several general mechanisms that could cause this process. Armed conflict can change individual, household, and community characteristics for any person, and these in turn are likely to affect migration. Thus, as shown with dashed lines in Figure 1b, these factors may mediate the relationship between conflict and migration. In addition, any of these factors can influence the relationship between conflict and migration and between another factor and migration. In other words, as shown with dotted lines, social, economic, and demographic factors can moderate the relationship between conflict and migration.

There are in fact several existing studies with evidence that suggests support for the complex mixed migration hypothesis. Lundquist and Massey (2005) find that migration specific capital interacted with a measure of contra war activity to produce a moderating effect on migration out of Nicaragua. They tested for, but did not find, interactions with other non-conflict measures. Williams (2013) finds statistically significant interactions between gun battles and access to community services in Nepal, again showing a moderating effect of a non-conflict factor on migration during armed conflict. Finally, Crush et al. 2012 find different effects of age, gender, social networks on migration during three cross-sectional surveys in Zimbabwe, in 1997, 2005, and 2010. Thus, while there is evidence indicating some support for the complex mixed migration hypothesis, it is sparse and more a by-product of a different research question.

In this context, this article introduces a new theoretical concept, the complex mixed migration hypothesis, and discussion of causal pathways to the existing foundation of sparse and disparate literature on variation in migration during armed conflict. Of course the exact mechanisms that influence the moderating and mediating influences are potentially many and may be different for each particular factor. A comprehensive theoretical treatment of each mechanism is far beyond the scope of this paper. This article instead seeks to introduce the hypothesis, test for supportive empirical evidence, and highlight the substantial academic and policy relevance of this area of study.

Context and Setting

The context of this study is the decade-long armed conflict (1996-2006) in Nepal. Analyses are based in the Chitwan Valley in the south-central part of the country. This context is ideal for this initial direct study of the mixed migration and complex mixed migration hypotheses for two reasons. Chitwan experienced a moderately intense intrastate conflict, making it similar in intensity and general character to the majority of armed conflicts worldwide in the last few decades (Human Security Report 2013). In addition, it is the site of detailed longitudinal survey data that provides a rare opportunity for precise examination of the causal question at hand, an opportunity that exists in few, if any, conflict-affected areas around the world.

The Chitwan Valley

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, with a recent increase in market-oriented agriculture.

Migration has always been common to destinations across Nepal and India. The two countries share an open border, so there are no restrictions on cross-border travel or work. Before the conflict, much of migration was seasonal and used as a strategy to supplement regular farm and household incomes (Thieme and Wyss 2005; Kollmair et al. 2006). Because of the short-term nature of migration from Chitwan, most migrants moved alone

and remitted large amounts of money, while other family members stayed at home to care for children, land, and livestock (Thieme and Wyss 2005; Kollmair et al. 2006). It was relatively rare for whole households to move together. Migration from Chitwan during the pre-conflict period was heavily influenced by gender and age, as well as economic, education, and other social predictors that closely align with migration theory and empirical patterns from other parts of the world (Bhandari 2004; Bohra and Massey 2009; Williams 2009).

Armed Conflict in Nepal

The conflict began in 1996 when the Communist Party of Nepal (Maoist) made a declaration of “People’s War” with the intention to unseat the constitutional monarchy and install a democratic republic. The early stages of the conflict were contained primarily in several mid-western districts, thus there was a sense of impending threat in other areas of the country (like the Chitwan Valley), but no direct violence. However, from mid-2000 the Maoists progressively expanded their campaign across rural areas of most of the country where they were challenged by a special Government of Nepal Armed Police Force. At this point, full scale violence encroached on the Chitwan Valley. Violence and political disturbances increased to a crisis peak in 2004 and 2005. By 2004, the Maoists had control of much of the country, succeeded in blockading the capital Kathmandu for several weeks, and there were multiple massive street protests and strikes. 2005 witnessed a State of Emergency, a ceasefire and subsequently renewed hostilities, the King forcibly over taking direct rule of the country, and more massive strikes and protests. In 2006, tensions slowly abated until a lasting peace agreement was signed in November 2006.

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. Reported violent acts by the Maoists and Nepalese government security forces against civilians include torture, extra-judicial killings, bombings, gun fights, abductions, forced conscription, billeting, taxing, and general strikes (Hutt 2004; Pettigrew 2004; SATP 2006). Both abductions for the purposes of labor and forced conscription into military forces were mainly targeted at unmarried young adult men.

Measuring Armed Conflict

Before describing the empirical analysis for this study, a careful discussion of how conflict is measured (for the purposes of studying migration or any other behavior) is required. Existing studies use many different methods; indeed there are almost as many measurement methods as published studies. However, there is very little discussion in the literature of which method is most appropriate for any research question and exactly what we can learn from each.

The simplest method is to delineate an entire period of a conflict as different from the pre- and post-conflict periods. The assumption underlying this method is that the conflict period is homogenous and entirely different from the pre- and post-conflict periods which are also homogenous. As suggested by several studies this assumption is largely erroneous, given that 1) a conflict is comprised of a series of violent and political events that change

dramatically with time and 2) these different events differentially influence migration (Engel and Ibanez 2007; Moore and Shellman 2006; Stanley 1987; Williams et al. 2012). For the case of Nepal, the varying conflict-related events are shown in Figure 2. As shown, the number of deaths (from assassinations, deaths in custody, gun battles, and bomb blasts) peaks in 2002, whereas the number of bomb blasts and gun battles peaks in 2004, and abductions and forced conscriptions reach a high in 2005. Clearly, the tactics and efficacy of each tactic changed dramatically over time. In addition, 2001-2002 witnessed a 10-month State of Emergency, and 2005 witnessed another that lasted for 3-months. There were also extended strikes and protests in 2005, and a variety of other conflict-related political events throughout.

In addition to direct conflict-related events, in any conflict there will be a variety of secondary effects on other aspects of economic, social and political life. For the case of Nepal, Figure 3a shows that there was a dramatic increase in unemployment in 2002, paired with a smaller, but still significant, increase in GDP per capita in purchasing power parity (PPP). In addition, reports indicate that several service organizations and service providers pulled out of rural areas that were deemed unsafe. Figure 3b shows this process in the Chitwan area, with a large increase in the number of minutes walk to the nearest bank in 2003¹. We do not find any such decreases in access to health posts and schools (and several other services that are not shown here) in Chitwan. However, as shown in Figures 3c and 3d, the functioning of health posts and schools did change throughout the conflict. For example, the average number of midwives per health post in Chitwan stayed relatively stable, but the number of beds and village health workers progressively decreased from 1998 through 2004, and the number of doctors shows a short decrease in 2003. In terms of schools, the number of teachers and students enrolled progressively increased throughout the conflict, but the number of students staying in overnight dormitories dramatically decreased until 2005. Any of these changes could have been caused by the conflict, and all of them could have influenced migration throughout the time period.

These direct and secondary effects of conflict on daily life clearly varied in intensity throughout the conflict, and each process peaked at a different time, suggesting that measuring conflict as a homogenous period of time is untenable. Instead, a second option is to measure each type of change separately, an event-centered approach advocated by Williams et al. 2012 and used by several other studies (Bohra-Mishra and Massey 2011; Lundquist and Massey 2005; Williams 2013). For example, one could use a variable for the number of gun battles per year or month, a variable for conflict-related deaths per year or month, a variable for annual unemployment, etc. In disaggregating the different conflict related processes (or events), this approach addresses the temporal complexities of conflict well and is able to pinpoint exactly which type of event influences migration and how.

A third, comprehensive approach, is to measure separate periods of time, such as years, during a conflict. For example, one could create separate measures for 2000, 2001, 2002, etc. Each of these measures then comprises all the changes that happened that year, which

¹Data on these services is only available through 2003, thus we do not know how access to banks, schools, and health posts changed after this date.

could include decreases in conflict-related deaths, increases in gun battles, and decreases in access to banks and village health workers, all at the same time. If a single year (e.g. 2002) is compared to a reference pre-conflict year, (e.g. 1997), then the researcher can argue that the differences in migration between the two years are due to the many differences in violence, economic, social, and political processes between the years. Careful delineation of exactly what were these differences is necessary for the analytical efficacy of this method. A major detraction of this comprehensive approach, in comparison to the event-centered approach, is that it does not allow the researcher a precise understanding of which events or processes influenced migration and the degree to which they did so. However, it has several key benefits. Specifically, it provides a comprehensive view of the effect of all primary and secondary effects of conflict. It also allows the researcher to uncover possible non-linear and threshold effects of the overall conflict on migration.

Each method of measuring conflict described here has benefits and detractions. Some require more and less data, and data availability is a consistent problem in conflict situations. Some are more and less specific and address different aspects of armed conflict. Ultimately, it is the exact research question (along with data availability) that should determine the method that is used in each study.

Data and Measures

Data for this study come from the Chitwan Valley Family Study (CVFS), 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 behaviors (Axinn, Barber and Ghimire 1997; Axinn, Pearce and Ghimire 1999; Barber et al. 1997). The CVFS provides several data sets, including an individual interview and life history calendar that were collected in 1996 and household-level agriculture and consumption surveys in 1996 and 2001. The feature data, however, is a prospective demographic event registry that was collected monthly beginning in 1997. With this, I use prospective monthly records of each individual's residence to define migration. The prospective nature of this data makes it ideal for studying migration by providing information on a representative sample of all people exposed to the possibility of migration. From a causal analysis perspective, this is highly preferable to retrospective surveys or those that sample at migrant destinations such as refugee or IDP camps. In fact, the scarcity of representative origin-based samples is likely one of the main reasons that there is little quantitative empirical research on determinants of migration during armed conflict.

Response rates for the CVFS are exceptional. For the individual interview and life history calendar, the CVFS obtained responses from 97 per cent of the original sample. Response rates for the prospective demographic event registry were influenced by attrition but were still high, at 94 per cent by 2007.

The demographic registry includes 151 neighborhoods that were selected with an equal probability, systematic sample that used a two-stage sampling procedure (Barber et al. 1997; Axinn et al. 1999). The sample in this study is restricted to those who were between the ages of 18 and 59 at the beginning of this study in June 1997, which excludes those who are

likely too young or old to be living or migrating independently. This results in a sample of 4058 people.

Outcome measure of migration

I define migration as a move outside Chitwan District for at least one month. Derived from monthly residence records of the CVFS prospective demographic event registry, my measure of migration is time-varying on a monthly basis. Notably, this study examines any migration, as opposed to first migration. This means that when a person returns to their original household from a migration spell, they are returned to the data set as well and are again considered to be at risk of migration. During the period of study, 56% of the sample migrated at least once. Table 1 presents descriptive statistics for migration and all other measures used in this study.

Measure of conflict

For this investigation, it is the period of conflict in which we are interested. As discussed above, the mixed and complex mixed migration hypotheses posit that migration and the determinants of migration will be different during a conflict period compared to before. As such, this analysis requires a comprehensive measure of conflict that includes all the violent and secondary events that comprised the conflict period in Nepal. Future studies would do well to further disaggregate how each individual, household, and community factor moderates and/or mediates the influence of different types of violence and other conflict-related events, but such detail is well out of the scope of this article.

Measuring the entire period of conflict is contraindicated in any case, as discussed above and in Williams et al. 2012. Instead, here I use a series of dichotomous variables for each year, from 1997 through 2006. I use 1997 as the reference year, thus each year and the events and processes that occurred in each year (as shown in Figures 2 and 3) can be compared to the relative peace of 1997. This approach also allows me to examine nonlinear changes in migration and nonlinear changes in the determinants of migration over time.

Measures of demographic and social characteristics

As the complex mixed migration hypothesis suggests that key determinants of migration during periods of relative peace will have different effects on migration during armed conflict, I use a variety of measures of individual, household, and community characteristics that are commonly found in the migration literature (Bohra and Massey 2009; Donato 1993; Harris and Todaro 1970; Korinek, Entwisle, and Jampaklay 2005; Massey and Espinosa 1997; Massey et al. 2010; Stark and Taylor 1991; VanWey 2005; Williams 2009, 2013). I focus most closely on several characteristics that are consistently amongst the strongest and most robust determinants of migration—age, gender, marital status, education, and migration experience. Of these characteristics, I use time-varying measures of age, marital status (currently married), and migration experience (ever migrated). Education was measured in 1996 and is therefore not time-varying. I use a measure of high education which separates those with at least 10 years of education (an important milestone in Nepal at which a School Leaving Certificate is earned) from those with less².

In addition to these key characteristics of interest, I use a series of control variables. Rural residence is measured as the distance to the nearest urban area, the city of Narayanhata. Ethnicity is measured with a series of five dichotomous variables that represent the five main caste groups in Chitwan (Brahmin/Chhettri, Newar, Dalit, Hill Indigenous, and Terai Indigenous). Non-family work experience was measured in 1996, is not time-varying, and includes those with any non-family work experience ever, including salaried or wage labor jobs. Any children ever born³ is time varying. Household ownership of land (logged), livestock (measured in livestock units, as suggested in Agrawal and Gupta 2005) and televisions are time-varying; they were initially measured in 1996 and were next updated in 2001. Finally, I use twelve dichotomous variables for months of the year to account for seasonal variations in migration due to agricultural cycles.

Analytic Methods

I use discrete-time event history models and logistic regression equations to predict out-migration from the Chitwan Valley. Person-months are the unit of exposure to risk. The models test the monthly hazard of migration out of the Chitwan Valley neighborhood after June 1997, contingent upon year, month of the year, and the individual, household, and community characteristics described above. All time-varying variables are lagged by one month in order to assure that the result being measured (migration) occurred chronologically after the independent variable was measured.

Notably, this is a study of any migration, including first and higher order migrations. This is implemented by creating a data set that excludes a migrant for the period of time they were living out of the origin neighborhood. When a migrant returned to their original neighborhood, they were again included in the data set.

I first test the effect of years on migration, by including in a model dichotomous indicators for each year from 1997-2006. This shows the non-linear effects of the conflict period on migration, and includes the many changes that occurred during the conflict, from violence to social and economic service accessibility. Next, to examine the mixed migration and complex mixed migration hypotheses, I test models that include the dichotomous year indicators (excluding 1997 which is the reference year), all migration predictors, and interaction terms between each migration predictor and each year. In order to avoid oversaturation, I use separate models for interactions with each predictor; one model includes interactions of gender with each year, another model includes interactions with age and each year, etc. Statistical significance of any of these interaction terms indicates that the predictor has a different effect on migration during that year compared to 1997.

²Two other specifications of education were tested: a linear specification of number of years of education completed (0-16), and a non-linear specification with four dichotomous variables to separate no education from low (1-5 years completed), middle (6-9 years completed), and high education (10 or more years completed). The results from all three specifications were substantively equivalent. I chose the high education specification for parsimony.

³The number of children ever born was also tested in all models. The results were substantively equivalent. Any children ever born has a larger effect on migration than number of children, as would be expected.

Results and Discussion

I begin by examining how migration changed over time. As shown in Model 1, Table 2, the likelihood of migration is the same in 1998 as in 1997 (because the coefficient is not statistically significant), then decreases dramatically after that. This progression is also shown in Figure 1. In 1999, the odds of migration for any person in the study are about 20% lower than in 1997. Amidst this general pattern of decreasing odds of migration, there is one distinct fall in the likelihood of migration in 2004, with an odds ratio of 0.39. 2004 is also the year when we find peaks in the number of gun battles and bomb blasts, as well as multiple strikes and protests and a three-week blockade of the capital Kathmandu by the Maoists. In contrast, it was in other years when we find peaks in conflict-related deaths, abductions and forced conscriptions, as well as unemployment. This suggests that although migration rates fell throughout the conflict, the particular combination of increased gun battles, bomb blasts, and political events in 2004 was more salient for migration behavior than other combinations that included increases in deaths and forced conscriptions. The precipitous fall in the odds of migration in this one year also suggest that there is likely a threshold effect of conflict on migration. This possibility warrants future investigation.

Model 1 also shows that individual, household, and community characteristics had statistically significant influences on migration throughout the pre-conflict and conflict period. The odds ratios for gender, age, having any children, land and livestock ownership are all below 1.0, meaning that women, older people, and those who have ever had any children were less likely to migrate than their male, younger and childless counterparts. Households with more land and livestock were less likely to migrate than those with less. Alternately, married, high education, rural residence, and migration experience had positive effects on migration. These results align closely with classic migration theory as well as evidence from other studies in Nepal and countries around the world (Curran et al. 2005; Donato 1993; Garip 2012; Massey and Espinosa 1997; Pedraza 1991; Todaro 1969; Todaro and Maruszko 1987; VanWey 2005; Williams 2009). Consistent results with existing theory and empirical work might otherwise be unsurprising, except that this study is conducted during a period of armed conflict. In this case, these results from Model 1 provide strong support for the mixed migration hypothesis. Furthermore, it is not just one factor that is important, but many social, economic, and demographic factors that have statistically significant and substantial influences on migration during the armed conflict.

Moving to the complex mixed migration hypothesis, Table 3 shows results from six models that included interactions between six key demographic and social characteristics of interest and each year from 1997 through 2006. As shown in Model 2, the direct effect of gender is 0.65, meaning that women had lower odds of migration than men, a result that is consistent with other studies of migration in Nepal (Bohra and Massey 2009; Williams 2009). Then, the interactions between gender and each year are positive, for 1998 through 2003. This is graphically presented in Figure 5, which shows the odds ratio effect of each key predictor for each year of the study. Only statistically significant effects are shown. As you can see, the odds effect of gender on migration increases to about 0.80 for much of the early conflict years. In other words, although women were less likely to migrate than men at any time, the gender gap was smaller during the early part of the conflict. However, the gender

interactions with 2004, 2005, and 2006 are not statistically significant, meaning that the gender gap in migration returned to the level of pre-conflict years. This is exactly the time when we find overall migration rates decreasing as well as increases in gun battles, bomb blasts, and abductions. Notably, it is well after peaks in unemployment and conflict-related deaths.

I find a relatively similar pattern for age. As shown in Model 3, the direct effect of age is 0.97 and not statistically significant. In subsequent years, the effect of age becomes slightly more negative, with the biggest decrease in the odds ratio for age in 2004. As with gender, the odds ratio effects of age are graphically presented in Figure 5.

Marriage and high education had similar patterns of change throughout the pre- and during-conflict period. Both had positive direct effects, meaning that people who were married or had completed at least 10 years of education were more likely to migrate than their counterparts. However, these influences decreased dramatically throughout the conflict period. By 2006, the odds ratio effect of both factors was just less than one. In other words, the effect of both factors almost entirely disappeared. However, there is one major exception in 2004, when I find no statistically significant interaction for married and a much weaker interaction for high education than in other years. Although both of these factors generally have positive influences on migration, this peak in effect which almost reaches that of pre-conflict years is similar to the pattern I find for gender.

Migration experience also has a notable change in influence on migration in 2004 and 2005. The direct effect of migration experience is positive, with an odds ratio of 3.02. This indicates that independent of the year, people with previous migration experience were about three times more likely to migrate than those without. The interaction terms from 1999 through 2003 are positive and generally large, suggesting that migration experience had a progressively stronger effect on subsequent migration through 2003 when the odds effect reached about 5.0. In 2004 and 2005 however, I find a pattern that is similar to gender, marriage, and education, where the interaction with migration experience is not statistically significant. Consequently, in these two years, the effect of migration experience on subsequent migration returns to what it was in pre-conflict years.

Returning to the complex mixed migration hypothesis, results for all five factors that I tested—gender, age, marriage, high education, and migration experience—show statistically significant changes over time during the pre- and during conflict periods. This is strong empirical support for the complex mixed migration hypothesis in this study site. The processes of change in how each of these factors influenced migration differed, as some increased in intensity while others decreased. Clearly, future research will be necessary to better understand the structural, normative, and social psychological mechanisms behind these varying change patterns. However, I do find one pattern that persists across four of these five factors (excluding age)—a dramatic increase or decrease in the effect of each factor in 2004 and/or 2005, such that they each returned or almost returned to pre-conflict levels. This is clear evidence of a non-linear change in effect of social and demographic characteristics on migration. In addition, it happens during years when gun battles, bomb blasts, and political events are more frequent than in other years. Notably, this dramatic

change does not occur in years that witness increases in unemployment and conflict-related deaths.

Conclusion

This article is a detailed investigation of the mixed and complex mixed migration during armed conflict hypotheses. Using the causal pathway diagram presented in Figure 1, I empirically test these hypotheses using detailed longitudinal survey data from Nepal during the recent conflict between the Maoists and Government. In event history models, I use some of the strongest and most consistent and robust predictors of migration around the world—age, gender, migration experience, education, and marital status. Because these factors are so robust and consistent, they are arguably amongst the least likely to change in their influence on migration at any time. Thus the results in this study, showing that the influence of these factors on migration did indeed change during the conflict in Nepal, are conservative and provide clear and strong evidence to support both the mixed and complex mixed migration hypotheses.

In addition to general support for these hypotheses, results show a notable pattern of non-linear change in the influence of these factors on migration. In particular, while all factors that I examined progressively increased or decreased in their influence on migration throughout the early conflict years, four out of five of these factors experienced a dramatic change in their influence in 2004 and 2005. It is in these two years that gun battles, bomb blasts, and certain political events were most frequent. It is notable then that the influence of most of the factors that I tested returned to pre-conflict levels in these years that experienced the highest intensity of conflict. This reasonably consistent pattern is non-linear and suggests that there might be some threshold of violence and political instability that can drastically change migration behaviors. Further research will be needed to elucidate this possibility.

While this article provides direct empirical testing and careful theoretical and causal analysis, it does not address the mechanisms that produce complex mixed migration processes. I find that each factor tested here (age, gender, migration experience, etc.) had a different trajectory of influence on migration throughout the conflict. For example, some factors increase in influence while others decrease. It is likely that the change in influence of each factor is driven by different mechanisms and varies according to each direct and secondary conflict-related event and process. These results provide direction for future research on this key topic.

While the complex mixed migration hypothesis is a useful academic exercise, the policy implications of this process are substantial. First, contrary to existing legal and policy frameworks, evidence presented here and in other studies that relate to mixed and complex mixed migration (Boehm 2011; Bohra-Mishra and Massey 2011; Crush et al. 2012; de Haas 2006; Jones 1989; Jureidini 2010; Khawaja, Assaf, and Yamout 2011; Lindley 2010; Lundquist and Massey 2005; Morrison and May 1994; Van Hear 2009; Vulltenari 2012; Williams et al. 2012; Williams 2013) shows that a variety of considerations, economic and social, as well as seeking safety, influence migration decisions during armed conflict. In other words, there is mounting evidence in more cases than not that the traditional

dichotomy between forced and voluntary migration is untenable and that most people move with some compulsion and some volition during armed conflicts.

Second, the implications of complex mixed migration for demographic projection are also significant. The foundation of this hypothesis is that the influence of many factors (individual, household, or community characteristics) on migration will change during armed conflict. From another perspective, this means that some people will migrate during an armed conflict when they otherwise would not have done so, and other people will not migrate when they otherwise would. Consequently, individual experience of migration and social norms regarding who migrates might change substantially. Through these mechanisms, we can predict that these altered patterns of migration might endure well after the cessation of a conflict. Thus, through complex mixed migration, armed conflict might change long-term migration patterns as well as long-term demographic growth and distribution. Unfortunately, very little is known about complex mixed migration. With this study and a few others (Crush et al. 2012; Lundquist and Massey 2005; Williams 2013), we can believe that it happens, but have little understanding of the nuances of how and why different factors change. This rarity of empirical and theoretical work, paired with the importance of this process for long-term population change, makes further study of the complex mixed migration hypothesis essential for the demographic sciences and post-conflict policy making.

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a. Causal pathway assumed by conventional studies of migration during armed conflict.

b. Causal pathway for mixed (solid lines) and complex mixed (dotted and dashed lines) migration hypotheses.

Figure 1. Causal pathways assumed by conventional, mixed and complex mixed migration hypotheses

Figure 2. Violent events and conflict-related deaths during the armed conflict in Nepal

2a. Economic indicators for Nepal

2b. Service access in Chitwan

2c. Health post services and providers in Chitwan

2d. Schools in Chitwan

Figure 3. Changes in economic indicators and social services during the armed conflict in Nepal

Figure 4. Changes in out-migration over time. Odds ratios of migration for each year, 1997-2006, from Model 1

Female **Age** **Married** **High education** **Ever migrated**

Figure 5. Changes in effects of migration determinants over time. Odds ratios from Models 2-6, CVFS data, 1997-2006

Table 1
Descriptive statistics of Chitwan Valley FS sample in 1997

	Mean	Std dev	Min	Max
Gender (female)	0.53	0.50	0	1
Age	32.89	12.19	15	59
Married	0.75	0.43	0	1
Any children	0.71	0.45	0	1
# of children	2.78	2.58	0	13
Land owned (# kattha)	24.27	28.38	0	200
Livestock owned	3.00	2.53	0	18.80
TV owned	0.24	0.43	0	1
# years education	4.33	4.37	0	16
High education (10+ years)	0.17	0.37	0	1
Ever had non-family job	0.43	0.50	0	1
Distance to city	8.65	4.06	0.02	17.70
Ever migrated	0.27	0.44	0	1
Brahmin/Chhetri	0.47	0.50	0	1
Dalit	0.10	0.30	0	1
Terai Indigenous	0.20	0.40	0	1
Hill Indigenous	0.15	0.36	0	1
Newar	0.06	0.25	0	1

Table 2
Out-migration before and during the armed conflict. Logistic regression estimates using
CVFS data 1997-2006

Model 1	Odds ratios	Z-statistics
Years		
1997	Reference	
1998	0.98	(0.39)
1999	0.81 ***	(4.17)
2000	0.82 ***	(3.83)
2001	0.83 ***	(3.33)
2002	0.74 ***	(5.23)
2003	0.71 ***	(5.72)
2004	0.39 ***	(13.47)
2005	0.59 ***	(8.27)
2006	0.54 ***	(9.16)
Individual characteristics		
Gender (female)	0.75 ***	(11.54)
Age	0.96 ***	(30.76)
Married	1.26 *	(6.04)
Any children	0.69 ***	(9.98)
Land owned	0.97 **	(2.55)
Livestock owned	0.99 **	(2.45)
TV owned	1.04 **	(2.53)
High education	1.21 ***	(6.48)
Ever had non-family job	0.97	(1.08)
Distance to city	1.04 ***	(11.33)
Ever migrated	3.76 ***	(46.01)
Caste/Ethnicity		
Brahmin/Chhetri	Reference	
Dalit ²	1.07	(1.19)
Terai Indigenous	3.76 ***	(10.00)
Hill Indigenous	1.07	(0.57)
Newar	3.76	(0.82)
-2 res log likelihood	67,937	
No. Obs. (person-months)	308,431	

Notes: Months of the year included in model. Results not shown here.

[^]
p < .10

*
p<.05

**
p<.01

p<.001 One-tailed tests.

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Table 3
Changes in determinants of out-migration, before, during, and after the armed conflict.
Logistic regression estimates using CVFS data 1997-2006

	Model 2 Gender	Model 3 Age	Model 4 Married	Model 5 High education	Model 6 Ever migrated
Direct effect	0.65 (5.43) ***	0.97 (0.97)	1.54 (4.89) ***	1.74 (6.59) ***	3.02 (14.43) ***
Interaction with 1997	Reference	Reference	Reference	Reference	Reference
Interaction with 1998	1.22 (2.05) *	1.00 (0.70)	0.88 (1.18)	0.74 (2.83) **	1.10 (0.99)
Interaction with 1999	1.23 (2.07) *	0.99 (2.50) **	0.86 (1.41) ^	0.74 (2.71) **	1.3 8 (3.01) **
Interaction with 2000	1.15 (1.38) ^	0.99 (2.49) **	0.84 (1.63) ^	0.67 (3.49) ***	1.24 (2.01) *
Interaction with 2001	1.20 (1.82) *	0.99 (2.41) **	0.80 (2.03) *	0.68 (3.41) ***	1.44 (3.17) ***
Interaction with 2002	1.26 (2.21) *	1.00 (0.50)	0.79 (1.98) *	0.60 (4.28) ***	1.40 (2.71) **
Interaction with 2003	1.22 (1.82) *	0.98 (2.99) **	0.69 (2.96) **	0.60 (4.16) ***	1.68 (3.80) ***
Interaction with 2004	1.08	0.97 (3.82) ***	0.92 (0.49)	0.73 (2.18) *	0.96 (0.26)
Interaction with 2005	0.86 (1.25)	0.99 (1.61) ^	0.63 (3.25) ***	0.61 (3.74) ***	1.04 (0.29)
Interaction with 2006	0.97 (0.23)	0.98 (3.66) ***	0.61 (3.02) **	0.55 (4.10) ***	1.96 (3.58) ***
<u>Direct effects of years and all other control variables are same as in Model 1. Results not shown.</u>					
-2 res log likelihood	67,915	67,902	67,917	67,906	67,898
No. Obs. (person-months)	308,431	308,431	308,431	308,431	308,431

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

Grey highlighting shows statistically significant ($p < 0.05$) difference compared to 1997.

^
 $p < .10$

*
 $p < .05$

**
 $p < .01$

 $p < .001$ One-tailed tests.