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United Nations peacekeeping personnel commitments, 1990–2011

Jacob D. Kathman
University at Buffalo, SUNY, USA

Abstract

This paper presents new data on personnel commitments to United Nations peacekeeping operations from 1990 to 2011. For every operation during this period, data on the number of deployed troops, police and military observers are coded at the monthly level. Additionally, the number of each personnel type contributed by every UN member state is recorded. These data offer opportunities for testing theories of peacekeeping and conflict processes and present research avenues for which data have hitherto not existed. Herein, I introduce the data and coding processes, present trends, illustrate prospects for research that could benefit from these data and provide an empirical application.

Introduction

Research on United Nations (UN) peacekeeping has recently seen enormous growth. Scholars have sought to understand how the UN chooses the conflicts in which it intervenes and how effective peacekeeping operations (PKOs) are at achieving their goals. However, a notable gap in this literature is the limited focus on the force compositions of PKOs. From one mission to the next, the type of personnel deployed, the size of those deployments and the contributor countries from which they are dispatched vary greatly. Yet few studies provide explanations for these differences or what effect they have on a host of peace and conflict phenomena.

I argue that one reason for this shortcoming is the dearth of data. While it is clear which conflicts have received PKOs and the time at which those missions arrived in and disengaged from their host countries, there is little in the way of an accounting for the capacity and composition of missions over their deployments. Force compositions are often only referenced in case analyses, leaving little work that makes comparisons across missions.[1] Consequently, quantitative research is hamstrung in addressing how issues of PKO capacity and composition are relevant to

Corresponding author:
Jacob D. Kathman, Department of Political Science, University at Buffalo, SUNY, 508 Park Hall, Buffalo, NY 14260, USA.
Email: jakekathman@gmail.com

phenomena of interest. In fact, much quantitative research relies on basic renderings of UN operations, simply dichotomizing the presence or absence of a mission in a given conflict state.

Yet, if quantitative scholars wish to gain a finer understanding of peacekeeping processes and contribute knowledge to the policy community, it makes little sense to rely on rudimentary renderings of peacekeeping in empirical models. For instance, if we wish to understand the conflicts to which the UN chooses to deploy operations, while it is worth our efforts to study the differences between wars that receive peacekeepers and wars that do not, we should also explore the effort the UN puts forth in these missions. The literature on peacekeeping effectiveness has been similarly limited. While it is valuable to understand the approximate effect of a mission's presence or absence in influencing conflict phenomena, the force commitments made to these missions are probably critical components of success. Furthermore, the composition of these forces may be important. Which member nations contributed personnel? How many personnel did they contribute? Why did some states commit troops while others did not? How consequential are the various amalgamations of troops from different contributor countries to PKO effectiveness?

These are relevant questions for scholars of peacekeeping to address. However, our ability to make comparisons across missions and contributor states is restricted by the lack of data, leaving quantitative scholars with limited information to tackle these issues. Importantly, our ability to make meaningful contributions to the policy community on issues of peacekeeping effectiveness, operational force compositions and other conflict management tools is largely inadequate for answering the types of questions for which policymakers need answers.

In response to these limitations, this manuscript introduces new data on UN PKOs that code mission force capacities at the mission–month level. The data are coded in two separate formats. First, the *aggregate data* include information on the type of personnel commitments made to each mission, including deployments of armed troops, armed police and unarmed observers. Across each personnel type, the size of the commitment to each mission is recorded, noting the number of each personnel type that is present in the host country. Second, the *disaggregated data* format codes the individual contributions of each UN member state to every PKO. Both formats are recorded for the post-Cold War era from January 1990 through December 2011. In the following sections, I first offer justification for the collection of these data and indicate trends across PKOs, noting new opportunities for quantitative research. I then provide a more detailed description of the data, discussing the information that is coded, definitions of terms and the information sources. Finally, I provide an empirical application and conclude with a brief discussion of the policy-relevant questions that may be addressed with these data.

Justification for a new dataset

The data introduced here should be valuable to the peacekeeping literature in many ways. The data should allow for a re-evaluation of extant peacekeeping models and open doors for testing new research questions. I also expect the data to prompt new avenues of research on topics that have yet to be meaningfully addressed in the quantitative literature. Below, I indicate areas of the literature that could benefit from the use of new data on (a) PKO deployments using the aggregate data and (b) member state contributions to PKOs using the disaggregated data.

Peacekeeping effectiveness and the aggregate data

One obvious area in which the aggregate data should have a significant impact is in analyses of peacekeeping effectiveness. Much has been written about the consequences of PKOs for a range of

conflict phenomena. Yet, the findings produced by this literature have, in some cases, been contradictory with regard to the ability of PKOs to yield peaceful outcomes (Fortna and Howard, 2008). For instance, research has indicated that PKOs are associated with a reduction in hostilities and an extension of the peace following civil conflict (Doyle and Sambanis, 2000; Fortna, 2004, 2008a; Gilligan and Sergenti, 2008). Others produce different results that point to peacekeeping as ineffective in securing durable peace (Diehl et al., 1996; King and Zeng, 2007). Additionally, the effectiveness literature has revealed somewhat mixed results on the ability of interventions to reconstitute war-torn societies, promote democracy and protect human rights. While some work indicates that PKOs can play a positive role toward these ends (Doyle and Sambanis, 2006; Hultman et al., 2013; Pickering and Peceny, 2006), others call such positive relationships into question (Bueno de Mesquita and Downs, 2006; Costalli, 2013; Fortna, 2008b; Gurses and Mason, 2006; Hultman, 2010).

Research has noted the importance of many mission characteristics as predictors of success, including the strength of mission mandates or the robustness of the mission goals (Evans, 2008; Fortna, 2004; Hoffman, 2004; Holt et al., 2009; Hultman, 2010; Kreps, 2010). However, the literature has not addressed some of the more fundamental and practical components of PKO effectiveness: mission composition and capacity. Indeed, the availability of large numbers of troops and other personnel may be one of the obvious factors related to an operation's ability to achieve its objectives. Lacking available data, work has yet to tackle how the various personnel types and the size of the personnel commitments affect success or failure.[2]

Therefore, it may be that contradictory findings in the effectiveness literature are a partial product of the rudimentary means by which PKOs are represented in empirical models. The modal form of accounting for PKOs in the quantitative literature is to dichotomize the presence or absence of a mission in a given conflict year. However, simple dichotomizations implicitly assume a level of homogeneity among PKOs. This is not reflective of reality.

PKOs are composed of multiple personnel types that are tasked with unique responsibilities. These personnel types fall into three main categories. First, armed military troops are generally the most forceful and militarily capable of the three. These soldiers are often tasked with enforcing ceasefires and peace agreements, interceding between the combatants and, at times, militarily punishing belligerents for continued transgressions. Troops thus serve as an instrument for ending the fighting and enforcing resolutions to the post-conflict security dilemma that often plagues belligerents (Walter, 2002). Second, armed police units are deployed behind the battlefield frontlines. Their functions include monitoring and protecting civilian populations where the rule of law has diminished. These forces are commonly tasked with policing refugee camps, where large civilian populations are vulnerable to predation. At times, this calls for UN police to enforce order by engaging in searches, investigations, detainments and arrests for criminal behavior. Also, police forces are asked to reform existing law enforcement structures in conflict states and to train indigenous police units, aiming to expand the capacity of law enforcement in host states (Holt et al., 2009). Third, observers are tasked with monitoring a host of conflict-related processes and regularly reporting this information to the UN Security Council (UNSC). Observers do not attempt to directly inhibit violence. However, observation plays an important part in the peacekeeping process. In their investigatory role, observers assess the progress of negotiations, disarmament, ceasefire adherence, political reform and civilian abuses. The information shared with the UNSC supports its decision-making with regard to the fulfillment or revision of mission mandates, augmenting of personnel commitments and assessment of progress toward peace. Yet, by simply dichotomizing PKOs, the information available on the types of personnel deployed and their associated responsibilities is lost. Without addressing the composition of PKOs, it is otherwise difficult
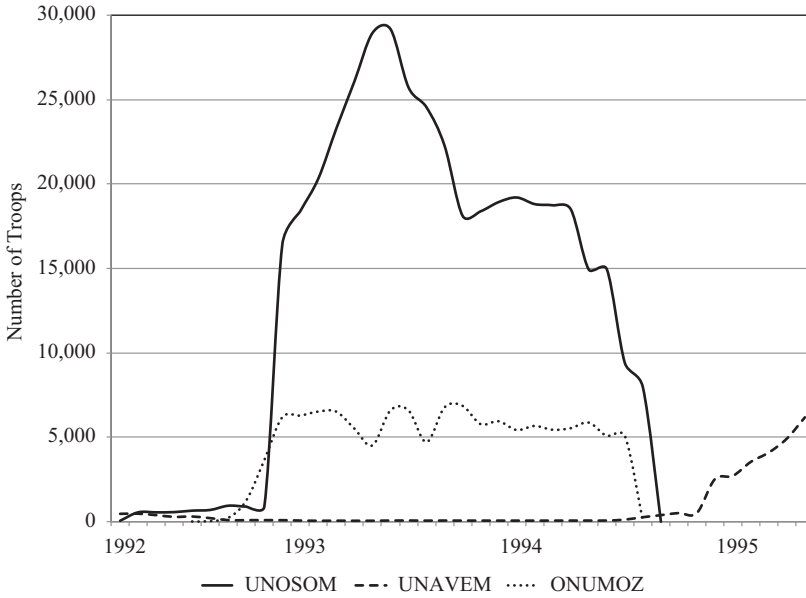
Figure 1. Three UN PKO armed troop commitments.

to compare the relative success or failure of missions given the different responsibilities that the personnel types are tasked with fulfilling.[3]

In addition to the personnel types that compose missions, the capacity of each mission relies upon the number of each personnel type that is deployed to each operation. Figure 1 plots several missions—the United Nations Operation in Somalia I and II (UNOSOM I and II), United Nations Angola Verification Mission II and II (UNAVEM II and III) and the United Nations Operation in Mozambique (ONUMOZ)—on a single personnel dimension. The missions were deployed over the same period of time to their respective conflict states. Clearly these missions were differentially equipped. The physical capacity of each was vastly different from the others. Is it fair to represent UNOSOM as empirically equivalent to UNAVEM in late 1993, when the two missions differed by tens of thousands of troops at their disposal? Dichotomous treatments of PKOs cannot account for these differences. Addressing differences in force capacities holds promise for revealing patterns in PKO effectiveness.[4] Yet much of the extant research has been necessarily limited to case analyses, lacking the necessary cross-sectional time-series data to make large-*n* comparisons (Findlay, 2002; Kreps, 2007, 2010; Nation, 2003; Pushkina, 2006).

Additionally, much of the work in the quantitative literature relies upon the conflict–year as the unit of analysis. Yet missions can change dynamically within a calendar year. This can have important consequences for conflict phenomena. The number and type of personnel devoted to a host state may vary dramatically within a year as the UNSC passes resolutions to escalate deployments or drawn down forces. Also, given the voluntary nature of personnel commitments, their arrival in conflict zones may occur at various speeds, affecting a mission's ability to pursue mandated objectives. Further, contributor countries may remove their forces from the host state at any time, causing potentially dramatic fluctuations in the number of personnel that a mission has at its disposal at a given point within the calendar year. Figure 1 reveals this. The UNOSOM missions varied dramatically in 1993, escalating by over 28,000 troops. ONUMOZ varied in size in late 1993 and

early 1994 by thousands of troops. Whereas the UNAVEM missions remained at very low levels for a long period of time, by early 1995 UNAVEM II began a striking intra-year escalation. Given how drastically PKO capacities can change within a calendar year, and given how dynamically peacekeeping and conflict phenomena are related, accounting for intra-year variation in deployments offers an important advance for studies of PKO effectiveness.

Moreover, mission–year dummies do not simply mask intra-year variation in missions but also obscure directional dynamics of intra-year changes. Even if extant analyses account for troop commitments, doing so with yearly units denies the researcher an opportunity to determine the accurate capacity of a mission within a given year. Referring again to Figure 1, the troop commitment to UNOSOM II in July 1993 was nearly identical to the deployment in February 1994, just seven months later. However, this equivalence in size obscures the fact that UNOSOM II was engaged in a significant escalation in July and an equally significant de-escalation in February. This intra-year dynamic of PKOs is overlooked by relying on yearly measurements, removing substantial nuance from observable changes in PKO deployments.

If we expect different personnel types to have diverse theoretical effects on peace and conflict processes, then it is important to account for the various ways in which missions are constituted, as each PKO is outfitted to fulfill its unique mandate. Thus, even if missions appear similar in their overall commitments, their performance may vary depending on the component personnel types that constitute each mission. Future research would benefit from data that distinguish the types of personnel contributed to each mission and the relative magnitude of the commitments made to these personnel types. For instance, the total personnel commitment to the UN's mission in Mozambique began and ended 1994 at approximately 5000 personnel deployed. However, the constitution of the mission was changing in important ways. Over this period, ONUMOZ transformed significantly, as the number of armed troops was decreased from the peak of 6,285 to 3941 by December, whereas the number of police personnel deployed escalated from 125 in January to over 1000 toward the end of the year. While much of the academic peacekeeping discourse focuses on the use of armed troops in peacekeeping missions, soldiers are only one element of operations. If the various personnel components of PKOs have distinctly different effects on peace and conflict processes, accounting for these variations in empirical models will have important consequences for the interpretation of peacekeeping's effectiveness. Whereas previous work was incapable of systematically accounting for these mission characteristics in studies of peacekeeping, the data introduced herein allow for much finer analyses. In the peacekeeping effectiveness research vein alone, these data should allow scholars to address a litany of phenomena related to peacekeeping and conflict dynamics, including the protection of civilians, resolution of ongoing hostilities, avoidance of conflict recidivism and reconstitution of societies.

PKOs are outfitted with various force capabilities, their component parts are variously arranged and they change dynamically, at times drastically, in short periods. Peacekeeping is not the discrete treatment that empirical models often assume. By amassing information in simple dichotomous conflict–year measures of PKOs, previous studies ignore the complex character of missions. Given the dynamism evident in personnel commitment levels, and since the different personnel types committed to PKOs are mandated to perform distinct tasks, identifying these differences and theorizing about their effects on conflict should be valuable to the literature.

Member state contributions to PKOs and the disaggregated data

Scholars have yet to engage in systematic, quantitative research on questions of why states contribute personnel to UN PKOs, why they choose to dispatch particular personnel types over others, and

why they choose to commit as many personnel units as they do. Answers to these questions are critical as they speak to issues that are central to the UN's ability to bring peace to war-torn regions. Given the voluntary nature of personnel commitments, distinguishing the various motivations for state contributions is important to the UN's ability to staff PKOs and should therefore be a fruitful scholarly enterprise with significant policy implications. By coding the personnel contributions of individual member states to each mission, the disaggregated version of the data will allow scholars to address such questions empirically in future research.

Addressing these issues in a systematic fashion is of growing import as the UN becomes increasingly committed to international peace. Indeed, total UN personnel deployments to its PKOs worldwide have increased from approximately 12,000 personnel deployed in the late 1990s to over 100,000 at its peak in 2010. If, for the sake of illustration, a researcher wished to gain a deeper understanding of this increase in member state contributions, one might notice in a closer look at this time period that much of the personnel burden has been borne by relatively few states. Notably, a significant portion of the overall PKO force levels is accounted for by India, Pakistan and Bangladesh, as the escalation of their individual contributions coincided with the UN's more general growth in personnel deployments during this time. Additionally, such UN member states as Jordan, Nepal, Nigeria and Rwanda significantly increased their contributions by several thousand personnel during this period.

Interestingly, the states bearing the burden of personnel contributions to PKOs are generally not among the most economically and militarily advanced in the world. In some cases, it can be argued that these states have not governed their own people in a fashion consistent with practices preferred by the UN. In recent decades, less-developed nations have generally accepted an increased responsibility relative to advanced states for staffing PKOs, what Lebovic (2010) has described as a passing of the burden from wealthy, industrialized states to poorer, less-developed countries. What are the implications of this? Are PKOs more or less effective based on characteristics of the states that staff them? Are peacekeepers welcomed or rejected by belligerents and civilians based on the nations from which the forces have been provided? What of abuses committed by UN forces themselves? Is this a partial product of the level of professionalism found in contributor state militaries? These important questions and a host of others can be addressed using disaggregated data on the number and type of personnel contributed to PKOs by the UN's member states. However, such data have not been available for engaging in the systematic analyses necessary to answer these questions.

With such data, scholars may also seek to address additional issues related to explanations of why contributor states escalate, maintain or reduce their mission deployments. Answers to these questions are especially important as member state contributions to PKOs are voluntary. Figure 2 offers an interesting illustration. A notable PKO failure was the UN mission to Rwanda (UNAMIR). In the initial stages of the country's genocide, individual contributor states unilaterally withdrew their personnel. As tensions rose, threats posed to the peacekeepers were perceived to be increasing. Following the deaths of 10 Belgian troops on 7 April 1994, Belgium removed its contingent of blue helmets by the end of that month. Similarly, as the civil war and genocide began consuming the country, other nations, like Ghana and Tunisia, started to withdraw. This may not be particularly puzzling if states naturally wish to reduce their exposure to violence. Yet, whether this is a generalizable phenomenon is an open question. Also, it is interesting that Ghana and Tunisia intensified their efforts in Rwanda shortly after withdrawing their forces whereas Belgium remained disengaged. What explains this variation in the escalation and withdrawal of deployed forces? How can the UN motivate greater contributions from its member states? How can the UN convince its member states to maintain these commitments throughout the course of deployments? With
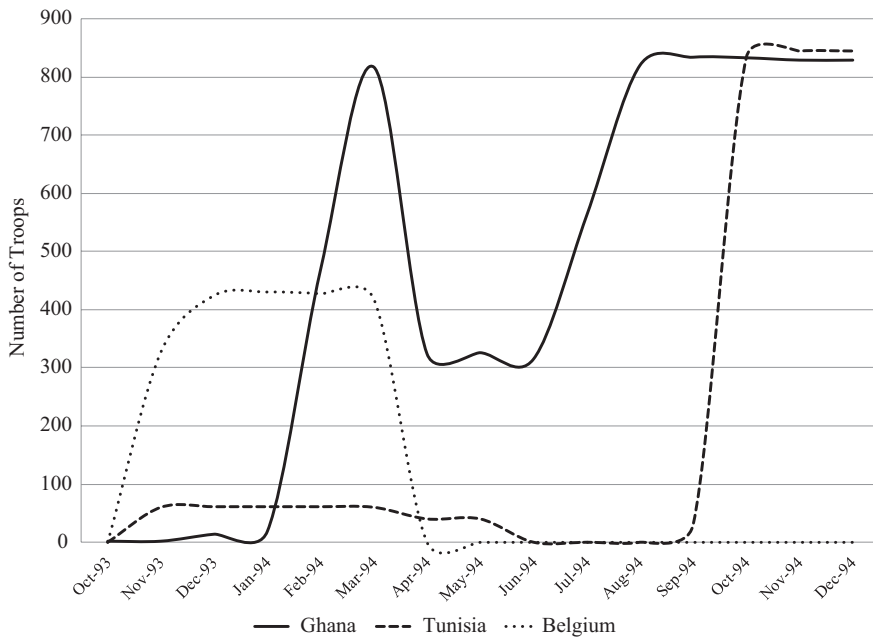
Figure 2. Member country contributions to UNAMIR, October 1993–December 1994.

disaggregated data on the number and type of personnel contributions to UN PKOs, such questions could be addressed empirically.

Data overview

Information coded

In an effort to satisfy the data needs of the peacekeeping literature in addressing the issues raised above, this project sought to collect extensive data on UN PKO personnel commitments.[5] The information collected was originally obtained from two related sources. Both sources were provided by the UN Department of Peacekeeping Operations (DPKO). First, the DPKO has made a wealth of data available on its website in the form of monthly contribution summary reports for each mission. These reports delineate the number and type of personnel committed to every mission by each of the UN's contributing member states. The DPKO website originally only made data available for the 2001–2011 period. The second source provided the data for 1990–2000. This source came in the form of hardcopy files of similarly formatted reports, which were obtained from the DPKO directly.[6] Data prior to 1990 are not available at the level of specificity coded here. Thus, the data cover the entire post-Cold War period, which includes the vast majority of PKO deployments.[7]

In the two formats that are described below, the data collected from these reports provide information at the monthly level on the number of armed troops, armed police and unarmed observer personnel committed by each of the UN's contributing member countries to every PKO worldwide. While the language of resolutions mandating peacekeeping missions appeals for a given number and type of personnel, these requests are fulfilled on a voluntary basis by member states.
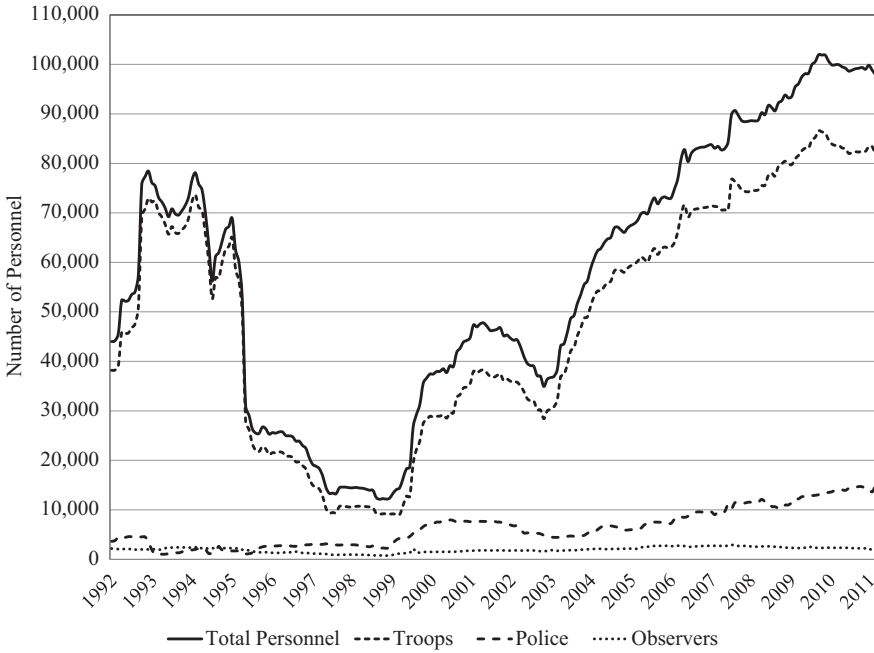
Figure 3. Number of personnel committed to PKOs by personnel type.

In order to represent the actual force levels of various PKOs in each host country, the information coded in this dataset does not report the number of each personnel type requested by the UNSC. Rather, the data record the number and type of personnel (troops, police and/or observers) that were actually present in the host country in a given month.

While the data on personnel type were coded at multiple levels of disaggregation, these data represent three distinct variables to account for the mix of personnel and force commitments made to PKOs. In addition to delineating the three personnel types, several more general variables are generated from the data described above. This information is not novel, and it can be found from other sources. However, it is included for ease of access should users require it. First, the total number of ongoing PKOs worldwide is recorded on a monthly basis. Second, the data record the gross number of troops, police and observers committed across all missions for each month. The summed total of all personnel types across all missions is also reported. This information, displayed in Figure 3, provides a more general sense of global trends in PKO deployments.[8] Interestingly, the trend in the number of personnel deployed to PKOs has varied substantially in the two decades covered by the data. The recent growth in mission personnel commitments has come in two major waves: one during the early to mid-1990s and one in the mid-2000s. While the overall number of personnel deployed worldwide exploded with the end of the Cold War and in response to UN support for successful efforts in the First Gulf War, a similar dramatic decline in peacekeeping personnel commitments occurred soon thereafter owing in part to notable failures like that in the war in Somalia and the subsequent apprehension in peacekeeping efforts that followed the mission in Rwanda. In this sense, there appears to be some support for the belief that overall PKO deployment levels follow the relative success or failure of missions in bringing stability to war-torn countries (Hillen, 2000). From the late 1990s, the number of personnel deployed grew in accordance with new mission deployments to an increasing number of civil wars worldwide. It then contracted in the initial years

of the 2000s following the de-escalation of previously substantial missions that were in the process of completing their mandates and grew dramatically thereafter.

This information will be valuable to scholars interested in a more systemic understanding of peacekeeping processes. Research programs of this type may address the relationship between the demand for peacekeeping forces and the supply of those forces from the UN's membership. Further, connections may be drawn between systemic commitment levels, more narrowly defined mission requirements and the availability of contributions from individual states.

Data format

As noted above, the data are available in two formats. The *disaggregated* dataset reports the monthly troop, police, observer and total (troop + police + observer) personnel contribution amounts made by each UN member country to each mission. The unit of analysis is the contributor–mission–month. As an example, Nepal contributed 804 troops, eight police and 10 observers for a total of 822 personnel to the UN Mission in Sierra Leone (UNAMSIL) in April 2003. Recording these amounts for every member state contribution to each mission–month yields 106,216 observations across each personnel type. In the time period covered, 148 UN member states contributed at least one troop, police or observer to at least one mission in an observed month. Of these, the five most common contributors in the post-Cold War period have been Sweden, Bangladesh, Russia, Canada and Poland.[9] However, contributing with the greatest frequency does not necessarily indicate the magnitude of those commitments. The five states that have contributed the most personnel to the missions covered by the data are Pakistan, Bangladesh, India, Nigeria and Jordan.[10] Descriptively, for member states that had at least one person deployed to a mission in a recorded month, troop contributions range from a minimum of zero to a maximum 9769, with a mean value of 113 and a standard deviation of 414. For police, deployments range from zero to 778, with a mean of 15 and a standard deviation of 48. Observer contributions range from zero to 2055, with an average of 5 and a standard deviation of 15. Finally, total contributions record a minimum of 1 UN personnel unit to a maximum of 9779, a mean of 131, and a standard deviation of 424.

The *aggregate* dataset has a mission–month unit of analysis and contains information on the number of troops, police, observers and total personnel commitments made to each PKO. With the mission–month unit of analysis, all individual member state contributions are summed into a single mission value for each month during which the mission is deployed to its host nation. Using the aggregated version of the example mentioned above, the UN deployed 14,461 armed troops, 112 police units and 254 observers for a total of 14,827 personnel to UNAMSIL in April 2003. With respect to descriptive statistics, the minimum number of each personnel type that the UN deployed to active missions in the post-Cold War world was zero. Yet the full range of each personnel type varies substantially as the maximum value is 38,614 for troops, 5511 for police and 1039 for observers. The mean level of armed troops per month was 2924 with a standard deviation of 5196, police units had a mean level of 388 with a standard deviation of 864, and the average observer deployment numbered 113 with a standard deviation of 153. Including all types, the total number of personnel deployed to a PKO ranged from 1 to 39,922, with a mean of 3356 and a standard deviation of 5566. All told, the aggregate mission–month data record 4414 observations across each deployed personnel type.[11]

Coding processes

The files from which the data are coded include monthly reports that are commonly titled "Summary of Peacekeeping Operations by Countries as of [*Day-Month-Year*]". These files display in tabular

format the number of troops, police and observer personnel dedicated by each UN member nation to every ongoing PKO in each month. Each mission then includes a mission total for each personnel type and a grand total that sums the three personnel types together.

The coding of these values was a straightforward process in the vast majority of cases. However, users of these data should be aware of some minor qualifiers. In some instances there are missing data. Three months are missing in their entirety in the disaggregated dataset: December 1998, November 1999 and February 2001. Also, while the DPKO reported the total personnel deployments throughout the time period covered by both data formats, it was not until August 1992 that troops, police and observers were individually reported consistently. Also, prior to 2001, the hardcopy files available from the DPKO, in a few instances, showed signs of wear. There were a limited number of instances in which the files contained unclear type resulting from smudges, wrinkles or other distortions. In some cases, values for a particular country's contribution to a PKO could be determined by summing the contributions of other member states and subtracting this value from the aggregate mission value. In others, values were cut off, as the information was not formatted properly to fit on the page. In these instances the data was unreadable, and the values were coded as missing. In total, there were 973 missing values recorded across the troop, police, observer and total personnel types in the aggregate dataset and 17,234 such mission values recorded in the disaggregate dataset. This amounts to only 3.9% of the observations recorded as missing for the individual personnel categories.

With regard to the reliability of the data, the data's accuracy was cross-checked in a number of ways. To confirm the reliability of the data reported by the UN, the reported mission totals for each month were compared with my own summation of each member state's individual contribution to those missions. If ever the UN's total monthly mission value differed from my own cross-contributor summation, the individual contributor values were investigated closely to search for typos or data entry errors that could lead to incongruence. If no discrepancy emerged, then there was no way to know whether the UN's original record of an individual country contribution was incorrectly transcribed or whether the UN's summation of those individual contributions was recorded incorrectly. Across the two data formats, 199 observations of the records were discrepant in this way, amounting to 0.18% of the summed personnel records.[12]

To further check against coding errors, two coding teams were employed. The first team directly coded the data from the available sources. The second team was tasked with reading the values coded by the first team and comparing them with the original reports. This two-step process was used to double-check for potential errors in the originally coded values, thus assuring the equivalence of the dataset with the information made available by the DPKO.

Compatibility with existing data

Country codes from the Correlates of War State System Membership dataset (Correlates of War Project, 2008) were used to identify the host nation(s) to which PKOs were assigned and to identify the contributor states. Since most conflict data projects follow Correlates of War country codes, these data can be combined with a variety of extant datasets.

Many conflict datasets measure their phenomena of interest at the country/conflict unit or at the country/conflict–year unit of analysis. While the data introduced here are measured at monthly levels, nothing inhibits the aggregation of this information to conflict/country values or to yearly values. Doing so, however, reduces the nuance that is present in the monthly format. To deal with issues of endogeneity and reverse causality, scholars often lag their independent variables one time point. This would be one year in a conflict–year unit of analysis. By doing this, a great deal of

information is lost and a conceptual leap is required in research like that which addresses PKO effectiveness. For instance, if we wish to uncover a causal effect of PKOs in civil war on civilian victimization, a one-year lag requires that a PKO in one year can be causally linked to civilian mistreatment in the following year. While this is a common methodological routine to avoid admittedly troublesome issues of endogeneity, the temporal distance between the independent treatment and the dependent outcome can be cause for concern, as conflict processes are commonly more dynamic than yearly time lags would suggest.

However, a positive development in data collection efforts has been the trend toward the spatial and temporal disaggregation of information for use in empirical analyses. Indeed, the increase in use of events data is one prominent example. A foremost case in point is the recoding of the Uppsala Conflict Data Program/Peace Research Institute, Oslo (UCDP/PRIO) Armed Conflict Dataset (ACD) to conflict events (Gleditsch et al., 2002; Sundberg et al., 2010) along with related data programs, like the One-Sided Violence Dataset (Eck and Hultman, 2007), for the post-Cold War period. Disaggregating such prominent conflict data offers excellent opportunities for testing new arguments and retesting existing theories. These events data can easily be transformed to monthly values that can be teamed with the data introduced here, as their post-Cold War temporal domains coincide. Doing so should allow for a richer, finer level of analysis of peacekeeping and conflict processes than has previously been possible.

An empirical application

For the purposes of exposition, I conduct a simple empirical analysis below. The different disaggregated and aggregate formats in which the data are available allow for several types of analyses that can be conducted according to the scholar's research interests. Yet space limitations make it difficult to provide in depth analyses using both the aggregate and disaggregated versions of the data. Given the prominence of the literature on peacekeeping effectiveness, I focus on the effect of peacekeeping operations on shaping conflict dynamics. Thus, the analysis conducted below employs only the aggregate version of the dataset.

To most effectively leverage the aggregate peacekeeping dataset in a statistical analysis, the data should be combined with a similarly fine-grained conflict dataset. As described above, the UCDP Georeferenced Event Dataset version 1.0 offers an event-level disaggregation of the ACD (Melander and Sundberg, 2011; Sundberg et al., 2010). By transforming the conflict event level observations into monthly values, these two data sources are easily merged with one another to match each peacekeeping mission with the conflict to which the missions were deployed. The monthly conflict data provided by Sundberg et al. currently cover Africa from 1989 to 2010.[13] Given the attention of the peacekeeping literature to civil war processes, I focus here on all civil wars coded by the ACD version 4-2012 (Gleditsch et al., 2002; Harbom and Wallensteen, 2010). Specifically, conflicts are identified by employing a threshold of 25 battle-deaths per year. The data covers 36 civil wars. Of these, 12 had a peacekeeping mission present at some point during the hostilities.

In terms of assessing peacekeeping effectiveness, there are a number of means by which peacekeeping success and failure have been judged. These have included assessing the level of violence produced by conflict, the duration of war, the durability of post-conflict peace and the pursuit of democratization following conflict (Diehl et al., 1996; Doyle and Sambanis, 2000; Fortna, 2008a, b; Gilligan and Sergenti, 2008; Jett, 2001; Jones, 2001; King and Zeng, 2007). Without engaging deeply in the debate on what most accurately constitutes PKO effectiveness, I simply choose to assess the effect of peacekeeping on the amount of violence produced in each conflict month. The

argument here is that, while PKOs may seek many goals as set out in their mandates, reducing the level of violence in civil war is paramount.[14]

Therefore, I assess a dependent variable that records the amount of violence produced in a given civil war month. This variable includes accounting for a variety of hostilities produced by civil wars. Specifically, at the monthly level the variable counts the number of government and rebel soldiers killed on the battlefield, the number of civilians targeted and killed by the factions, the number of civilians "caught in the crossfire" and killed unintentionally, and the number of individuals who were killed for whom an affiliation (government, rebel or civilian) or type of death (unintentional or purposeful) was unknown.[15] Thus, this variable provides an accurate reflection of the overall level of violence produced in each civil war month. Given the event count nature of the dependent variable, a negative binomial model is appropriate.

The models below distinguish two means of accounting for UN PKOs in ongoing civil wars. The first, *PKO Dummy*, is common in the literature. It simply indicates the presence (1) or absence (0) of a PKO in a given conflict country in each month.[16] Model 1 assesses the relationship between *PKO Dummy* and the total violence produced in each war month, while controlling for additional explanations of hostilities. Model 2 accounts for variation in the capacity of PKOs and the types of personnel deployed. Three variables capture aspects of the data described in the previous sections. These variables code the number and type of personnel deployed to a country in each conflict month. *PKO Troops* captures the number of armed troops, *PKO Police* measures the number of armed police forces and *PKO Observers* counts the number of unarmed observer personnel committed to each conflict. These variables account for nuance in PKOs to determine whether this nuance can add to our understanding of peacekeeping effectiveness relative to the more common aggregation of PKOs into simple dummy variables. All of the peacekeeping variables are lagged one month to ensure temporal order.

I also control for other explanations of civil war violence that have been substantiated in the literature. First, I account for the source of the conflict between the government and rebels, as the belligerents' motivations may be important to understanding of the fervor with which they confront each other and the violence they choose to perpetuate against civilians (Kalyvas, 2006; Valentino, 2004). *Incompatibility* is a dichotomous indicator of the ACD's delineation of wars fought over territorial (0) or government (1) control. Second, I include a variable that reflects the duration of conflict, as longer wars have been shown to produce greater hostilities (Lacina, 2006). *War Duration* counts upward to reflect each war's monthly duration. Next, a larger population offers greater capacity for the recruitment of soldiers to dedicate to fighting and greater opportunities for violence against civilians. I thus include *Population*, which records each conflict country's log-transformed yearly population size, using data from the disaggregated Composite Index of National Capability scores in the National Material Capabilities Dataset (Singer et al., 1972). Also, the intervention literature has indicated an important relationship between civil war violence and the involvement of third party states (Cunningham, 2010; Regan, 2000, 2002; Thyne, 2009). I include a dummy variable that indicates those conflict months in which at least one third party state has intervened in favor of the government or rebel forces. Finally, to account for temporal dependence, I include *Total Deaths Lag*, which is a single month time lag of the dependent variable.[17]

Model 1 addresses the dichotomous variable indicating the presence or absence of a PKO in each civil war month. The coefficient for *PKO Dummy* is positive and significant, indicating that the presence of a PKO is associated with higher levels of violence. Thus, when using the more conventional method of dichotomizing peacekeeping in empirical models, this result suggests a more general ineffectiveness of PKOs in bringing stability to war-torn states.

Table 1. UN peacekeeping and violence in civil wars

Variable	Model 1	Model 2
PKO Dummy	2.08* (0.82)	—
PKO Troops	—	−0.13*** (0.03)
PKO Police	—	−6.89*** (1.94)
PKO Observers	—	10.80*** (2.52)
Incompatibility	2.06*** (0.37)	2.15*** (0.37)
War Duration	−0.004 (0.002)	−0.004 (0.002)
Population	0.41** (0.15)	0.45** (0.15)
State Intervention	0.67 (0.44)	0.67 (0.43)
Total Deaths Lag	0.0003 (0.0004)	0.0004 (0.001)
Constant	−3.20* (1.60)	−3.74* (1.58)
Observations	2453	2439
Wald X^2	181.96***	310.20***
Log pseudo-likelihood	−9427.33	−9350.59

*** Significant at $p < 0.001$, two-tailed. ** Significant at $p < 0.01$. * Significant at $p < 0.05$.
Robust standard errors clustered on conflict are given in parentheses.

Model 2 disaggregates *PKO Dummy* into the three personnel variables that constitute each mission's operational composition and commitment level. The results indicate that rising numbers of armed troops and police units decrease the overall level of violence produced by civil wars. Yet an increasing number of observer personnel increases hostility levels. There may be good reasons to expect that these different personnel types have differential effects on the level of violence produced by civil war. First, the negative effect produced by *PKO Troops* and *PKO Police* may be a product of the armed and capable nature of soldiers and police units and their physical ability to intercede between the combatant parties and between the combatants and vulnerable civilian populations. More specifically, as the number of troops committed to a PKO increases, the mission should have a greater capacity for intervening between the factions, creating a buffer zone between them, inhibiting violence and convincing the belligerents that efforts by the parties to directly contest one another militarily will be obstructed. Furthermore, having access to large numbers of troops allows missions to cover larger territories and send increasingly resolute signals of the UN's commitment to resolving the war. These functions may thus produce the negative effect reported in Table 1. Similarly, access to a larger number of armed police units improves a PKO's ability to defend vulnerable civilian populations, patrol larger areas, train and arm indigenous police forces more quickly, and assist in the disarmament of the belligerents. These functions help to explain the negative result produced by *PKO Police*.

The opposite effect is found for *PKO Observers*. This is interesting, as one might expect that the international audience cost of continued violence should cause factions to scale back hostilities in an effort to be perceived by the international community as legitimate actors worthy of a role in post-conflict governance. Yet, observers are the most weakly mandated of the three types. They are unarmed and have no capacity to impede violence. In addition, the belligerents may respond strategically to the arrival of observers. As ever more observers are deployed, the belligerents may come to expect that a more robust mission is in the offing. Such an expectation could lead the combatants to engage in hostile offensives to weaken their opponent prior to the arrival of a robust mission that may solidify the status quo balance of power.

These elements of PKOs have gone unaccounted for in past research. More generally, the results indicate that simply dichotomizing PKOs in models of civil war processes comes with limitations. PKOs are differentially outfitted with various personnel types, and these differences have dissimilar consequences for conflict. From one operation to the next, the capacity and constitution of missions can vary dramatically. Accounting for these differences should thus be an important component of future research on peacekeeping effectiveness. Furthermore, the data offer avenues for addressing additional questions in similar research veins. Which states contributed the personnel units? Are PKOs differentially effective depending on the contributor states from which the troops, police and observers originated? These data make a reliance on dichotomous indicators of PKOs unnecessary and should allow for innovations in empirical models of peacekeeping and conflict processes. Furthermore, these processes are dynamic. For instance, conflict phenomena that occur as a result of changes in the strategic relationship between combatant groups take place in close temporal order, often requiring finer empirical precision than is available in conflict–year analyses. The monthly level at which these data are coded allows for more nuanced validations of dynamic conflict management theories. The growing availability of conflict data that is gathered at levels finer than the conflict–year offers a richer exploration of these processes than has been available in previous empirical models.

Conclusion

The systematic study of peacekeeping processes has expanded greatly. Yet, unresolved debates and unexplored avenues of research remain, including the ongoing debate over peacekeeping effectiveness and our largely uncultivated understanding of why states contribute to, escalate or withdraw from PKOs. Further exploring these issues with highly detailed data should not only allow for more rigorous empirical investigations of these phenomena, but it should also improve the literature's ability to make applicable recommendations to the policy community.

Policy-makers charged with constructing and deploying peace operations are likely to view results generated from models employing the common dichotomization of PKOs as rather unhelpful for the purposes of guiding their efforts to assemble a mission that uniquely confronts the challenges of an ongoing conflict. Different PKOs are variously packaged to include distinct personnel types with a range of force capacities, dissimilar mandates and a variety of member states that constitute them. Results generated from the aggregate data should help to inform policy-makers of the personnel arrangements that most closely correlate with conflict outcomes they hope to achieve in a potential peacekeeping intervention.

Additionally, the UN's relevance as a purveyor of global peace is dependent upon the continued voluntary personnel contributions of its member countries. However, research on what compels states to give to UNSC-approved missions is still in its infancy. Using the disaggregated data, scholars may productively study relationships that are associated with greater personnel contributions from the UN's membership. Are there means by which contributions can be motivated beyond the UN's monthly troop reimbursement amount of US$1028 per soldier per month? What informal channels appear to be associated with greater member contributions?[18] The disaggregated data should provide an important step for quantitative scholars to begin addressing these phenomena empirically in systematic ways.

While the data presented here do not exhaustively code the endless features of PKOs, the data do report a vast amount of information on critically important mission characteristics that have not previously been made available. These data are likely to serve as a foundation for advances in the peacekeeping and conflict processes literatures, allowing scholars to test a range of theoretical

insights in more rigorous empirical models. As a result, these data should allow scholars to make academic progress and provide guidance to the policy community.

Notes

1. This is not to say that case studies cannot assess the effect of force compositions for individual missions. For instance, see Kuperman (2001). However, much of the qualitative work that addresses force composition does so in assessing mission effectiveness, often pointing to the limited availability of troops as an explanation of PKO failure without providing systematic comparisons (Feil, 1998; Nation, 2003). Outside of counterfactual analysis, it is difficult to make judgments about the effect of personnel commitments on mission effectiveness without comparisons.
2. Some previous data gathering efforts have recognized the importance of mission capacity. For instance, Mullenbach and Dixon's Third Party Intervention in Intrastate Disputes dataset (see Mullenbach, 2005) codes a variety of information on PKOs, including the maximum number of personnel committed to an operation at some point over the course of the mission's deployment. However, these data do not indicate how personnel deployments change over time and thus how the capacity of a given mission can change within the same deployment. As indicated below, mission deployments often vary greatly between and within operations over time.
3. Accounting for these PKO traits is especially important as scholars have recognized that imprecise language in mandates can make mission responsibilities unclear, such as blurring the divisions between Chapter VI and VII mandates or civilian protection responsibilities (see Findlay, 2002 or Holt et al., 2009), thus increasing the value of accounting for the actual personnel types deployed and their associated responsibilities.
4. See Hultman et al. (2013) and Ruggeri et al. (2013).
5. One criticism of these data is that peacekeeping efforts made by other organizations and states are not coded. However, for many non-UN cases, it is nearly impossible to find data with consistent coverage at the level of detail that is evident in the data described here. Additionally, there may be important differences across international organizations and states that make a uniform coding of PKOs difficult. Finally, given that the UN is the preeminent peacekeeping organization with global responsibilities, it is reasonable to focus the data collection on UN PKOs.
6. These files were obtained by James Lebovic (George Washington University), who subsequently shared them with me. Obtaining these files was no small feat. Jim Lebovic deserves credit for securing and sharing these files, as my own requests of the DPKO, and those of others, produced little in the way of shared data. Lebovic (2004) originally used a yearly version of the information culled from these reports that covered the 1993–2001 period to examine the effect of a state's level of democracy on its willingness to contribute personnel to UN peace operations.
7. Approximately 75% of UN PKOs were initiated during this time period. The data also include information on PKOs that were initiated prior to this time period and subsequently spanned the Cold War and post-Cold War eras for those months that were observed starting with January 1990.
8. Given some data restrictions, described below, the information in Figure 2 is truncated to an August 1992 start.

9.   The most common contributor states were determined by summing the number of mission–months in which each contributor state had deployed at least one personnel unit. This was then divided by the total number of mission–months covered by the data. For the states listed above, the percentages were as follows: Sweden 57.5%, Bangladesh 53.1% , Russia 52.9%, Canada 51.3% and Poland 51.1%.

10. Determining which countries have contributed the most PKO personnel for the period covered by the data is not straightforward, as the value of each country's contribution fluctuates over time. The calculation was determined by summing the total number of troops deployed by the UN to every PKO across every month. I then summed the number of personnel contributed by each UN member state and calculated the percentage of the UN's deployments that were accounted for by each contributor state. For the states listed above, the percentages were as follows: Pakistan 10%, Bangladesh 9.4%, India 7.8%, Nigeria 4.4% and Jordan 3.9%.

11. Taken together, the two formats record 442,520 unique observations across the troops, police, observers and total personnel types. Including identifying information such as the mission's name, host state and contributor state names and code numbers, and dates, the number of cells across the matrices exceeds 4 million.

12. Still, in both data formats, I provide my summation and the DPKO's summation across the personnel types. I suggest that researchers rely upon my summation, as I assume that the most likely mistake to be made by the DPKO is in summing the values across the personnel types rather than recording the values of those personnel types.

13. While only conflicts in Africa are currently available, these data are being coded for all conflicts globally.

14. Assessing the overall level of violence is consistent with several ways in which the literature has attempted to judge PKO effectiveness and assess the effectiveness of foreign intervention more generally (see Regan, 2000, 2002). Each of the means of judging effectiveness is associated with the level of violence produced by civil wars.

15. It may be that these various forms of violence have distinct theoretical processes. For the purposes of exposition, and given an interest in overall violence levels, the different types of fatalities are considered jointly.

16. It is actually uncommon to see a monthly level of specificity in the peacekeeping literature. The conflict–year unit is closer to the norm. For comparison across measures, I use the conflict–month in each of the following models.

17. Since the nature of Table 1 is to provide an empirical application of the data collected and described in the previous sections, I do not delve into an interpretation of the results produced by the control variables with the exception of simply noting that the results are rather consistent across the models.

18. For an example of informal means of achieving coordination in the UNSC, see Kuziemko and Werker (2006).

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