

Coding Decisions & Additional Results for “Geographic Proximity and Third Party Joiners in Militarized Interstate Disputes”

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Data Set Construction

Rules for Including MIDs

We use the Correlates of War (COW) Militarized Interstate Dispute (MID) data set to identify a sample of disputes (Ghosn, Palmer, and Bremer 2004). The rules for including MIDs in our data set was based only on the values of certain variables for the initial belligerents. We define the initial belligerents of a MID as those states involved in a MID on its first day either as the state(s) that took the first codeable militarized action or as the state(s) that was targeted by that militarized action. We consider a state(s) to be the initiator of a MID if Side A equals 1, which occurs when a state(s) crosses the MID threshold by either threatening to use force or using force before its opponent. We consider a state(s) to be the target of a MID if Side A equals 0.¹ MIDs are included in our data set if the following two conditions are met:

1. The MID lasted for more than 1 day (i.e., the start date of a MID could not be equal to the end date).
2. The hostility level of the **dispute** had to be 4 (use of force) or 5 (war). Note: this rule requires that only one of the initial belligerents have a hostility level of 4 or 5. For example, in MID# 4, the UK (country code or ccode 200) had a **participant** hostility level of 3 but Albania (ccode 339) had a **participant** hostility level of 4, which made the overall hostility level of the **dispute** a 4 and thus, this MID is included in our data set. Another example is MID# 11, in which Austria (ccode 305) had a **participant** hostility level of 1 but Germany (ccode 255) had a **participant** hostility level of 4,

¹We acknowledge that the label ‘initiator’ may not truly reflect who initiated the dispute in the broader sense of ‘instigator.’ This way of determining initiators and targets, while limited, is standard in most research using the MID data set including the conflict expansion literature (Joyce, Ghosn, and Bayer Forthcoming, Melin and Koch 2010, Siverson and Starr 1991, Werner and Lemke 1997, see also Bennett and Stam 2004).

which made the overall hostility level of the **dispute** a 4 and thus, this MID is also included in our data set. In short, only one of the initial belligerents is required to have a **participant** hostility level of 4 in order for the MID to be included in our data set.

Multiple Initial Belligerents

If there were multiple initial belligerents of a MID then we created a set of initiator-target dyads. For example, MID# 50 had three initial belligerents, the US (ccode 2) and Taiwan (ccode 713) on the initiating side and China (ccode 710) on the target side. We created two dyads: a US-China (2-710) dyad and a Taiwan-China (713-710) dyad.

Joiners

A state was considered to have joined a MID if it participated in the MID for at least one day after the first day of the MID. It is not possible for us to determine whether a state joined a MID voluntarily or “joined” because they were targeted by another state after the first day of a MID. A state was considered to have joined the initiating side if they were not an initial belligerent and Side A equals 1. A state was considered to have joined the targeted side if they were not an initial belligerent and Side A equals 0.

We are not concerned with how long a state that joined participated in a MID or why and when they exited a MID. States are counted as joiners (assuming they meet the conditions stipulated above) even if they only participate for one day. For example, the UK (ccode 200) joined MID# 122 on June 25, 1961 and exited on June 26, 1961. As another example, South Korea (ccode 732) joined MID# 1217 on February 24, 1967 which is on the same day that the MID ended.

We are also not interested in a state that joins a MID multiple times (e.g., joining, exiting, joining). We only include the first joining occurrence. Once a state joins a MID it is removed from the data set. For example, in MID# 4095, Greece (ccode 350) initially joins on August 17, 1996 but later exits on October 25, 1998, re-joins on July 21, 1999 and exits on October 7, 1999, and re-joins again on October 20, 2000 and exits on April 26, 2001. In our data set, we code Greece as joining on August 17, 1996.

Initial Belligerent Participation

If an initial belligerent only participated in a MID for a single day then potential joiners do not have the ability to join that initial belligerent (i.e., they are removed from the data set). For example, MID# 1382 began on July 14, 1974. On the day the MID began, Sudan (target, ccode 625) exited the MID leaving three other initial belligerents; Uganda (initiator, ccode 500), Tanzania (target, ccode 510), and Zambia (target, ccode 551), all of whom participated in the MID until it ended on September 7, 1975. Thus, there is not a Uganda-Sudan (500-625) dyad for states to join for this MID.

If a state joined a MID the same day an initial belligerent exited then we coded that as joining. For example, MID# 3051 began on March 8, 1984 and involved Libya (initiator, ccode 620), Sudan (target, ccode 625), and Egypt (target, ccode 651) as initial belligerents. Thus we have two dyads that states could potentially join, a Libya-Sudan (620-625) dyad and a Libya-Egypt (620-651) dyad. In this MID the US (ccode 2) joins on March 19, 1984, which is on the same day that Egypt exits the MID. We count the US as having joined both dyads in this MID because it joins on the initiating side.

MID Start Dates

If a MID began on December 31 of a particular year, then we moved the start date forward to January 1 of the next year. For example, MID# 2155 began on December 31, 1966 and ended on April 22, 1967. We changed the start date of this MID to January 1, 1967.

MID End Dates

If a MID ended on January 1 of a particular year, then the end date of the MID was moved back 1 day to December 31 of the previous year. For example, MID# 1238 ended on January 1, 1949. We moved the end date back to December 31, 1948.

Initial Belligerents Exiting

Since the initial belligerents of a MID determine the length of time until a potential joiner could join that MID, when an initial belligerent exits before the MID ends then potential joiners no longer have the ability to join that initial belligerent. For example, MID# 135 involves 4 initial belligerents, 3 on the initiating side (UK, France, Spain with ccodes 200, 220, and 230, respectively) and 1 on the target side (Mexico, ccode 70). This MID begins on October 31, 1861 at which point potential joiners have the opportunity to join one of the initiator-target dyads (e.g., the UK-Mexico or 200-70 dyad). However, on April 8, 1862, the UK and Spain exit the MID, at which point potential joiners can no longer join the UK-Mexico (200-70) or Spain-Mexico (230-70) dyad. In MIDs with only two initial belligerents, the same rule applies except if an initial belligerent exits then the MID is coded as having ended on that day. In short, the length of time a potential joiner has for joining an initiator-target dyad in a MID is determined by the earliest end date for one of the initial belligerents in that dyad. For example, in MID# 611 between the US (ccode 2) and Vietnam (ccode 816), the MID is coded as having ended on January 27, 1973 when the US exits the MID even though the MID continues (because of states joining the US before January 27, 1973) until April 30, 1975.

World War II

We split World War II (MID# 258) into two separate MIDs. The first MID (now labeled MID# 999) begins on March 25, 1939 where Poland (ccode 290) and Germany (ccode 255) are the initial belligerents. We coded this MID as ending on September 27, 1939 when Poland exits the MID. Thus, any states that joined World War II between March 25, 1939

and September 27, 1939 are considered to have joined this MID. As a result, states that joined in the first MID (# 999) are not considered to be at risk of joining the second MID (# 258). The second MID begins on September 28, 1939 and ends on August 14, 1945, where the UK (ccode 200) and Germany are considered to be the initial belligerents. Note: we still consider the UK as a joiner in the first MID (# 999) even though we code the UK as an initial belligerent in the second MID (# 258).

Congo War

In MID# 4339 there are missing start dates for four states: Democratic Republic of the Congo (ccode 490), Rwanda (ccode 517), Uganda (ccode 500), and Namibia (ccode 565). We coded the Democratic Republic of the Congo and Rwanda as initial belligerents of the MID and coded the MID as beginning on August 2, 1998. We coded Uganda as joining this MID on August 4, 1998 and Namibia as joining on August 30, 1998.

Start/End Dates of MIDs

- If a MID is missing its start day then we coded its start day as being on the first day of the month the MID began.
- If a MID is missing its end day then we coded its end day as being on the last day of the month the MID ended (accounting for the fact that different months have different days and some years are leap years).
- If a MID is missing both its start and its end day but lasted for at most one month as indicated by the start month being the same as the end month, then we coded its start day as being on the first day of the month the MID began and coded its end day as being on the last day of the month the MID ended (accounting for the fact that different months have different days and some years are leap years).
- If a MID is missing both its start and its end day but lasted for more than one month, then we coded its start day as being on the first day of the month the MID began and coded its end day as being on the last day of the month the MID ended (accounting for the fact that different months have different days and some years are leap years).
- MIDA coded MID# 1656 as ending on November 11, 1918 while MIDB coded this MID as ending on January 11, 1918. Since this MID marks the end of World War I, we coded the end month as being in November, which corresponds with the coding in MIDA.

Start/End Dates of Joiners

- If the day a state joined a MID is missing we coded the joining day as occurring on the first of the month.

- MID# 1806 began on January 18, 1968. In this MID, China (ccode 710) joined in January but the joining day is missing. As a result, we coded China as having joined the MID one week later on January 25, 1968. The same rule was used for MID# 375.
- If a state joined a MID on January 1 then we moved the joining date back one day to December 31 of the previous year. For example, in MID# 51, France (ccode 220) joined on January 1, 1951. We coded France as joining on December 31, 1950. The same rule was used for MID#s 1363 and 2604.

Membership in the International System

Since a potential joiner is at risk of joining each day during a MID, we needed to correct for the dates of entry into and exit from the international system. We used the COW State System Membership List (Correlates of War Project 2008) to make these corrections. In our data set, a potential joiner does not become at risk of joining until the day they enter the state system and if a state exits the state system, they cease to be at risk of joining the day they exit the state system.

- If a MID began the day a potential joiner exited the state system then we did not consider that state to be at risk of joining that MID. For example, MID# 3855 began on July 14, 1940 and the Netherlands (ccode 210) exited the state system on July 14, 1940. Since the day the Netherlands ceased to be at risk of joining was the same day the MID began then the Netherlands is not considered to be at risk of joining this MID.
- If a MID ended the day a state exited the state system then that state was still considered to be at risk of joining that MID. For example, Japan exits the state system on August 14, 1945 and MID# 3264 ends on August 14, 1945. In this MID, Japan was still considered to be at risk of joining.
- If a MID ended the day a state entered the state system then we did not consider that state to be at risk of joining that MID. For example, Mongolia (ccode 712) entered the state system on March 13, 1921 and MID# 230 ended on March 13, 1921. Since the day Mongolia became at risk of joining this MID was the same day the MID ended then Mongolia is not considered to be at risk of joining this MID. We lose one case of joining due to this rule, which is Angola who entered the state system on November 11, 1975 and joined the target in MID#1441 on November 11, 1975, which is the same day the MID ended.
- If a state entered the state system on December 31 of a year then we moved its entry day forward one day to January 1 of the next year. For example, Comoros (ccode 581) entered the state system on December 31, 1975 and we moved their entry day to January 1, 1976.
- If a MID had multiple initial belligerents but one of the initial belligerents exited before a potential joiner entered the state system, then that potential joiner is still at risk of joining the MID but is not at risk of joining the initiator-target dyad where one initial

belligerent exited before the potential joiner became a member of the state system. For example, MID# 3507 involved three initial belligerents: Peru (initiator, ccode 135), Germany (target, ccode 255), and Japan (target, ccode 740), which form two separate dyads: Peru-Germany (135-255) and Peru-Japan (135-740). On May 7, 1945 Germany exited the MID, which is the same day that Denmark (ccode 390) re-entered the state system. As a result, Denmark is still at risk of joining the Peru-Japan dyad on either side, but is not at risk of joining the Peru-Germany dyad.

- In the MID data set, Ethiopia (ccode 530) is coded as having joined MID# 258 on January 24, 1941. However, Ethiopia is not considered a state until May 5, 1941. We coded the joining date as occurring on May 6, 1941.
- In the MID data set, Canada (ccode 20) is coded as having joined MID# 2606 on January 1, 1920. However, Canada is not considered a state until January 10, 1920. We coded the joining date as occurring on January 11, 1920.

Initial Belligerents

- MID# 22 between Russia (ccode 365) and Latvia (ccode 367) is coded as having ended on June 17, 1940. However, Latvia exits the state system on June 16, 1940. We changed the end day of this MID to June 16, 1940. Similarly, MID# 505 between Russia and Estonia (ccode 366) is coded as having ended on June 17, 1940. However, Estonia exits the state system on June 16, 1940. We changed the end day of this MID to June 16, 1940.
- MID# 3557 between Yugoslavia (ccode 345) and Bosnia (ccode 346) is coded as beginning on April 6, 1992. However, Bosnia did not enter the state system until April 7, 1992. We changed the start date of this MID to April 7, 1992.
- MID# 1083 between Morocco (ccode 600) and Algeria (ccode 615) is coded as beginning on July 2, 1962. However, Algeria did not enter the state system until July 5, 1962. We changed the start date of this MID to July 5, 1962.
- MID# 633 between Taiwan (ccode 713) and China (ccode 710) is coded as beginning on October 1, 1949. However, Taiwan did not enter the state system until December 8, 1949. We changed the start date of this MID to December 8, 1949.
- MID# 2006 between Taiwan (ccode 713) and the US (ccode 2) is coded as beginning on October 2, 1949. However, Taiwan did not enter the state system until December 8, 1949. We changed the start date of this MID to December 8, 1949.
- MID# 2186 between South Korea (ccode 732) and North Korea (ccode 731) is coded as beginning on May 5, 1949. However, South Korea did not enter the state system until June 29, 1949. We changed the start date of this MID to June 29, 1949.
- MID# 2007 between Taiwan (ccode 713) and the UK (ccode 200) is coded as beginning on October 18, 1949 and ending on November 16, 1949. However, Taiwan did not enter the state system until December 8, 1949. We dropped this MID from the data set.

- MID# 3599 between Yugoslavia (ccode 345) and Austria (ccode 305) is coded as beginning on May 2, 1919 and ending on June 9, 1919. However, Austria did not enter the state system until September 10, 1919. We dropped this MID from the data set.
- MID# 2856 between Syria (initiator, ccode 652), Italy (target, ccode 325), and France (target, ccode 220) is coded as beginning on April 16, 1958 and ending on April 17, 1958. However, Syria exits the state system on February 1, 1958 and does not re-enter the state system until September 29, 1961. We dropped this MID from the data set.
- MID# 3152 between Syria (ccode 652) and Turkey (ccode 640) is coded as beginning on March 5, 1958 and ending on April 13, 1958. However, Syria exits the state system on February 1, 1958 and does not re-enter the state system until September 29, 1961. We dropped this MID from the data set.
- MID# 108 between Italy (ccode 325) and Albania (ccode 339) is coded as beginning on April 7, 1939 and ending on April 8, 1939. However, Albania exits the state system on April 7, 1939 and does not re-enter the state system until November 17, 1944. We dropped this MID from the data set.
- MID# 1225 between Thailand (ccode 800) and Cambodia (ccode 811) is coded as beginning in November 1953 but its start day is missing. Since Cambodia enters the state system on November 9, 1953 we changed the start date of this MID to November 9, 1953.

Independent Variables

Capability

We use the Correlates of War (COW) Composite Index of National Capability (CINC) (Singer, Bremer, and Stucky 1972) to measure the capability of the initial belligerents and each potential joiner.² We adjust a potential joiner's capability contribution to account for distance (in kilometers) using the loss-of-strength gradient. We examine two different distance variables. First, we use the distance from a potential joiner to the initial belligerents. Second, we use the distance from a potential joiner to the MID location.

Distance to Initial Belligerents

Since our temporal domain is 1816-2001 we combined several distance data sets to take advantage of the best data set available for each time period. For the time period 1816-1874, we used capital-to-capital distance (converted from miles to km using $1\text{km}=0.621371192$ miles, generated by EUGene). For the 1875-1945 time period, we used the Gleditsch and Ward (2001) minimum distance data. In the Gleditsch and Ward (2001) data set minimum distances are recorded for states within 950km. Thus, for states at distances greater than

²There were several missing values in the CINC data: Panama (1903-1919, ccode 95), Brazil (1822-1825, ccode 140), Hanover (1837, ccode 240), Morocco (1912, ccode 600), Afghanistan (1919, ccode 700), and Bangladesh (1971, ccode 771). We replaced these missing values with the closest non-missing data point.

950km from each other we used capital-to-capital distance (generated by EUGene). For the 1946-2001 time period, we used the minimum distance between states from the CShapes data set (Weidmann, Kuse, and Gleditsch 2010).

We first calculated the capability of the initiator(s) and target(s) in a MID. If there is only one initiator or one target then the capability of that initiator or target is simply the value of their CINC score for each year of the MID. If a MID lasts past December 31 of a given year then a state's CINC score can change, which means that a potential joiner's capability contribution to an initial belligerent can change as well.

We account for the fact that some MIDs have multiple initial belligerents by summing the CINC scores of the initial belligerents on each side. For example, MID# 56 had 6 initiators (the UK, ccode 200; France, ccode 220; Germany, ccode 255; Austria-Hungary, ccode 300; Italy, ccode 325; and Russia, ccode 365) with CINC scores 0.165821, 0.086936, 0.13223, 0.046542, 0.03087, and 0.107471, respectively. We calculate the capability of the initiators in this MID by summing their CINC scores, which results in a capability value of 0.56987. Also, MID# 56 had two targets (Greece, ccode 350; and Turkey, ccode 640) with CINC scores 0.002106 and 0.024258, respectively. We calculate the capability of the targets in this MID by summing their CINC scores, which results in a capability value of 0.026364. Additionally, if an initial belligerent exits a MID then their CINC score is no longer included in this calculation. For example, MID# 1213 began on March 19, 1964 and involved two states on the initiating side (the US, ccode 2; and the Republic of Vietnam, ccode 817) and one state on the target side (Cambodia, ccode 811). However, the US exits on October 25, 1964 but the MID lasts until April 28, 1965. The capability of the initiators in 1964 is the sum of the CINC scores of the US and the Republic of Vietnam, which are 0.20316 and 0.003521, respectively. The capability for the initiators of this MID in 1964 is 0.206681. However, the capability for the initiators of this MID in 1965 is just the CINC score for the Republic of Vietnam in 1965, which is 0.006533.³

Since a potential joiner can either join the initiator or target, we followed Bueno de Mesquita and discounted a potential joiner's capability contribution to the location where it is stronger (1981, 108). When there are only two initial belligerents (one initiator and one target) then the location where a potential joiner is stronger is simply the shortest distance to the initiator or target. For example, in MID# 4 between Albania (initiator, ccode 339) and the UK (target, ccode 200), the distance between the US (a potential joiner, ccode 2) and Albania is $\approx 6,547$ kilometers and the distance between the US and the UK is $\approx 4,112$ kilometers. Thus, when adjusting the US capability to account for distance we used the distance between the US and the UK. We account for the fact that some MIDs had multiple initial belligerents by

³Since each observation in our data set represents a year in a MID, if an initial belligerent exits a MID that does not last past December 31 of a year then we cannot adjust the combined capabilities when there are multiple initial belligerents. For example, MID# 521 began on July 22, 1917 and ended on November 11, 1918. In this MID there was one state on the initiating side (Thailand, ccode 800) and two states on the target side (Germany, ccode 255; and Austria-Hungary, ccode 300). However, on November 3, 1918 Austria-Hungary exits the MID. Since Austria-Hungary exited the MID the year the MID ended we cannot update the combined CINC scores of the targets.

finding the shortest distance between a potential joiner and all of the initial belligerents. For example, MID# 56 had 8 initial belligerents; 6 initiators (the UK, ccode 200; France, ccode 220; Germany, ccode 255; Austria-Hungary, ccode 300; Italy, ccode 325; and Russia, ccode 365) and 2 targets (Greece, ccode 350; and Turkey, ccode 640). The US distance from the initiators is $\approx 5,903$; 6,167; 6,714; 7,126; 7,221; and 88 kilometers, respectively, and the US distance from the targets is $\approx 8,259$ and 8,731 kilometers, respectively. Thus, when adjusting the US capability in this MID to account for distance we use the distance between the US and Russia (≈ 88 kilometers).

We followed the procedures used in Bueno de Mesquita (1981), whose indicator “depends on the number of days it takes to transport a major military operation” (104).⁴ Bueno de Mesquita (1981) defines the transportation ranges as ≈ 402 kilometers per day from 1816-1918, ≈ 604 kilometers per day from 1919-1945, and ≈ 805 kilometers per day after 1945.⁵ We then adjusted a potential joiner’s CINC score using the formula from Bueno de Mesquita (1981, 105):

$$\text{Adjusted CINC} = \text{CINC}^{\log_{10}[(\text{distance to initial belligerents}/\text{kilometers per day})+(10-e)]} \quad (1)$$

Bueno de Mesquita notes that his loss-of-strength gradient assumes that a state’s capability is not discounted within a radius of $\approx 1,094$ kilometers from 1816-1918; $\approx 1,642$ kilometers from 1919-1945; and $\approx 2,189$ kilometers from 1946 onwards (Bueno de Mesquita 1981, 106-107). As a result, when the shortest distance a potential joiner is from an initial belligerent is less than the radius for a particular time period we do not adjust that potential joiner’s capability to account for distance. For example, in MID# 8, which occurred in 1856-1857, the shortest distance between the Netherlands (potential joiner, ccode 210) and an initial belligerent (the UK, ccode 200) is ≈ 359 kilometers. The capability of the Netherlands (in 1856) before accounting for distance is 0.010071. If we applied the loss-of-strength gradient above then the adjusted capability of the Netherlands would be 0.0150648, which is larger than the Netherlands original capability. Since distance should only decrease a potential joiner’s capability we set the Netherlands’ capability in 1856 for this MID to its original capability (0.010071).

Distance to MID Location

Our adjustment for the loss-of-strength gradient using the distance to MID location follows the same construction as our adjustment using the distance to the initial belligerents (see Distance to MID Location section below for the construction of this variable). We first calculated the capability of the initiator(s) and target(s) in a MID. Next, we accounted for the fact that some MIDs have multiple initial belligerents by summing the CINC scores of the initial belligerents on each side. Since we have a single point location for a MID we do not need to discount a potential joiner’s capability contribution to the location (i.e., initiator or target) where it is stronger. We also used the transportation ranges described above. We

⁴Bueno de Mesquita (1981) presents his calculations in miles, which we have converted to kilometers.

⁵MID#’s 197, 1777, 2363, 2365, 2366, 2603, 2605, 2606, and 2704 begin in one transportation range and end in another transportation range. For example, MID# 197 begins in 1917 and ends in 1920. For these MIDs we used the transportation range based on the year the MID began.

then adjusted a potential joiner's CINC score using the formula from Bueno de Mesquita (1981, 105):

$$\text{Adjusted CINC} = \text{CINC}^{\log_{10}[(\text{distance to MID location}/\text{kilometers per day})+(10-e)]} \quad (2)$$

As described above, we follow Bueno de Mesquita and do not discount a potential joiner's capability within a certain radius that varies according to the time period when the MID occurred. As a result, when the distance a potential joiner is from the location of a MID is less than the radius for a particular time period we do not adjust that potential joiner's capability to account for distance. For example, in MID# 4, which occurred in 1946, the distance between Yugoslavia (potential joiner, ccode 345) and the MID location is ≈ 498 kilometers. The capability of Yugoslavia (in 1946) before accounting for distance is 0.005341. If we applied the loss-of-strength gradient then the adjusted capability of Yugoslavia would be 0.009125, which is larger than Yugoslavia's original capability. Since distance should only decrease a potential joiner's capability we set Yugoslavia's capability in 1946 for this MID to its original capability (0.005341).

Construction of Capability Variable

Our measure accounts for the difference in the probability that an initial belligerent wins if a potential joiner joins that initial belligerent and the probability that the initial belligerent wins if the potential joiner does not join (i.e., remains neutral). The capability contribution a potential joiner can make to the initiator(s) is calculated as the capabilities of the initiator(s) and potential joiner relative to the combined capabilities of the initiator(s), target(s), and potential joiner minus the capabilities of the initiator(s) relative to the initial belligerents:

$$\frac{C_I + C_{PJ}}{C_I + C_T + C_{PJ}} - \frac{C_I}{C_I + C_T} \quad (3)$$

where C_I , C_T , and C_{PJ} represent the capabilities of the initiator(s), target(s), and potential joiner, respectively. The term on the left represents the probability that the initiator wins if the potential joiner joins the initiator and the term on the right represents the probability that the initiator wins if the potential joiner does not join (i.e., remains neutral). The capability contribution a potential joiner can make to the target(s) is calculated as the capabilities of the target(s) and potential joiner relative to the combined capabilities of the initiator(s), target(s), and potential joiner minus the capabilities of the target(s) relative to the initial belligerents:

$$\frac{C_T + C_{PJ}}{C_I + C_T + C_{PJ}} - \frac{C_T}{C_I + C_T} \quad (4)$$

The term on the left represents the probability that the target wins if the potential joiner joins the target and the term on the right represents the probability that the target wins if the potential joiner does not join (i.e., remains neutral).

We measure the maximum capability contribution a potential joiner could make to either initial belligerent by calculating the maximum contribution it can make to the initiator compared to the target:

$$\max \left(\frac{C_I + C_{PJ}}{C_I + C_T + C_{PJ}} - \frac{C_I}{C_I + C_T}, \frac{C_T + C_{PJ}}{C_I + C_T + C_{PJ}} - \frac{C_T}{C_I + C_T} \right). \quad (5)$$

Thus, if a potential joiner’s capability contribution to the initiator (target) is greater than its capability contribution to the target (initiator) then we use that value to represent the capability contribution a potential joiner can make to either initial belligerent.

Contiguity

Contiguity is measured by determining whether the potential joiner shares a common land border or is separated by 150 miles of water or less from an initial belligerent (i.e., contiguous) as determined by the COW Direct Contiguity data set (Stinnett, Tir, Schafer, Diehl, and Gochman 2002). We create a binary variable that equals 1 if the potential joiner is contiguous to an initial belligerent and 0 otherwise.

Regime Type

We measure regime similarity between a potential joiner and the initial belligerents using the Polity IV data set (Marshall and Jaggers 2010). We use the polity2 variable, which measures the difference between a state’s democracy and autocracy scores, and that fixes polity scores to account for -77 (interregnum, coded as 0), -88 (transition, values are smoothed across the transition period), and -66 values (interruption, treated as missing). We also used the modified Polity IV data provided by Gleditsch (2008) to initially fill in as many missing values as possible.

The following states are not included in the Polity IV data set: Dominica (ccode 54), Grenada (ccode 55), St. Lucia (ccode 56), St. Vincent and the Grenadines (ccode 57), Antigua and Barbuda (ccode 58), St. Kitts and Nevis (ccode 60), Monaco (ccode 221), Liechtenstein (ccode 223), Andorra (ccode 232), San Marino (ccode 331), Sao Tome Principe (ccode 403), Seychelles (ccode 591), Vanuatu (ccode 935), Kiribati (ccode 946), Tuvalu (ccode 947), Tonga (ccode 955), Nauru (ccode 970), Marshall Islands (ccode 983), Palau (ccode 986), Federated States of Micronesia (ccode 987), and Western Samoa (ccode 990). We dropped these states from our data set. Of these states, there is one state, Grenada, that was the target of a MID (# 3058). As a result of removing Grenada from the data set we dropped MID# 3058. In MID# 3058 there were 7 states that joined (Cuba, ccode 40; Jamaica, ccode 51; Barbados, ccode 53; Dominica, ccode 54; St. Lucia, ccode 56; St. Vincent and the Grenadines, ccode 57; and Antigua & Barbuda, ccode 58). We lose those cases of joining as well. Egypt (ccode 651) is also not included in the Polity IV data set from 1855 to 1882. We dropped Egypt from our data set during this time period. As a result, we dropped one MID (#3725) in which Egypt was an initial belligerent.

Even after filling in as many missing values as possible using existing data, there were many that still remained. We used the following procedures to correct those missing values:

- Haiti (ccode 41): has a missing value in 1915 (the year it exits the state system). The polity2 value from 1859-1914 is -3 . We coded the polity2 value in 1915 as -3 .
- Dominican Republic (ccode 42): has missing values for 1914-15, 1916 (the year it exits the state system), and 1924 (the year it re-enters the state system). The polity2 value from 1894-1913 and from 1925-29 is always -3 . We coded the polity2 value from 1914-16 and 1924 as -3 .
- Mexico (ccode 70): has missing values for 1846-47 and 1863. The polity2 value from 1835-45, from 1848-62, and from 1864-66 is always -3 . We coded the polity2 value in 1846-47 and 1863 as -3 .
- Honduras (ccode 91): has missing values in 1907, 1912, 1919, and 1924. The polity2 value in 1906 is 0 and the polity2 value in 1908 is 5. We took the average of the two values ($(0+5)/2=2.5$) and coded the polity2 value in 1907 as 2.5. The polity2 value from 1908-1935 is always 5. We coded the polity2 value in 1912, 1919, and 1924 as 5.
- Nicaragua (ccode 93): has missing values for 1926-27. The polity2 value from 1909-1935 is always -3 . We coded the polity2 value in 1926-27 as -3 .
- Peru (ccode 135): has missing values for 1881-82. The polity2 value from 1879-1885 is always -3 . We coded the polity2 value in 1881-82 as -3 .
- Netherlands (ccode 210): has a missing value for 1940 (the year it exits the state system). The polity2 value from 1917-1939 and from 1945-2001 is always 10. We coded the polity2 value in 1940 as 10.
- Belgium (ccode 211): has missing values for 1914, 1939, and 1940 (the year it exits the state system). The polity2 value from 1913-1918 is always 7 and the polity2 value from 1930 to 2001 is always 10. We coded the polity2 value in 1914 as 7 and the values from 1939-40 as 10.
- Luxembourg (ccode 212): has missing values for 1940 (the year it exits the state system), 1944 (the year it re-enters the state system), and 1945. Except for these three missing values, the polity2 value is always 10. We coded the polity2 value in 1940 and from 1944-1945 as 10.
- Portugal (ccode 235): has missing values from 1816-1819. The polity2 value from 1820-1832 is always -3 . We coded the polity2 values from 1816-1819 as -3 .
- Germany (ccode 255): has a missing value in 1945 (the year it exits the state system). The polity2 value from 1933-1944 is always -9 . We coded the polity2 value in 1945 as -9 .
- Saxony (ccode 269): has a missing value in 1848. The polity2 value in 1847 is -9 and the polity2 value in 1849 is -7 . We coded the polity2 value in 1848 as -8 .

- Hungary (ccode 310): has missing values in 1944 and 1956. The polity2 value from 1920-1943 was always -1 and the polity2 value from 1948-1987 was always -7 . We coded the polity2 value in 1944 as -1 and the polity2 value in 1956 as -7 .
- Yugoslavia (ccode 345): has missing values from 1915-1917. The polity2 value in 1914 is 4 and the polity2 value in 1918 is 0. We coded the polity2 value to account for the fact that it decreased from 4 in 1914 to 0 in 1918 as: 3 in 1915, 2 in 1916, and 1 in 1917.
- Bosnia & Herzegovina (ccode 346): has missing values from 1995-2001. The polity2 value from 1992-1994 was always 0. We coded the polity2 value from 1995-2001 as 0.
- Greece (ccode 350): has missing values from 1916-1919. The polity2 value in 1915 was 1 and the polity2 value in 1920-21 was also 1. We coded the polity2 value from 1916-1919 as 1.
- Bulgaria (ccode 355): has a missing value in 1913. The polity2 value from 1908-1917 was always -9 . We coded the polity2 value in 1913 as -9 .
- Romania (ccode 360): has a missing value in 1916. The polity2 value from 1910-1937 was always -4 . We coded the polity2 value in 1916 as -4 .
- Estonia (ccode 366): has a missing value in 1918 (the year it enters the state system). The polity2 value from 1919-1932 was always 10. We coded the polity2 value in 1918 as 10.
- Norway (ccode 385): has a missing value in 1940 (the year it exits the state system). The polity2 value from 1905 to 2001 is always 10. We coded the polity2 value in 1940 as 10.
- Denmark (ccode 390): has a missing value in 1940 (the year it exits the state system). The polity2 value from 1915-2001 is always 10. We coded the polity2 value in 1940 as 10.
- Uganda (ccode 500): has a missing value in 1979. The polity2 value in 1978 was -7 and the polity2 value in 1980 was 3. We took the average of the two values ($-7+3/2=-2$) and coded the polity2 value in 1979 as -2 .
- Ethiopia (ccode 530): has missing values in 1936 (the year it exits the state system) and 1941 (the year it re-enters the state system). The polity2 value from 1930-1935 and from 1942-1945 is always -5 . We coded the polity2 value in 1936 as -5 and the polity2 value in 1941 as -5 .
- Turkey (ccode 640): has missing values from 1918-1921. The polity2 value from 1909-1917 is -1 and the polity2 value in 1922 is 0. We coded the polity2 value to account for the fact that it increased from -1 in 1917 to 0 in 1922 as: -1 in 1918, 0 in 1919, 0 in 1920, and 0 in 1921.

- Syria (ccode 652): has a missing value in 1958 (the year it exits the state system). The polity2 value from 1951-1957 was always -7 . We coded the polity2 value in 1958 as -7 .
- Lebanon (ccode 660): has missing values from 1990-2001. The polity2 value from 1975-1989 was always 0. We coded the polity2 value from 1990-2001 as 0.
- Kuwait (ccode 690): has a missing value in 1990. The polity2 value from 1986-1989 is always -10 . We coded the polity2 value in 1990 as -10 .
- Afghanistan (ccode 700): has missing values from 1979-1988 and 2001. The polity2 value in 1978 was 0 and the polity2 value from 1989-1991 was always -8 . We coded the polity2 value to account for the fact that it decreased from 0 in 1978 to -8 in 1989 as: 0 in 1979, 0 in 1980, -1 in 1981, -2 in 1982, -3 in 1983, -4 in 1984, -5 in 1985, -6 in 1986, -7 in 1987, and -8 in 1988. The polity2 value from 1996-2000 was always -7 . We coded the polity2 value in 2001 as -7 .
- China (ccode 710): has missing values in 1860 (the year it entered the state system), 1861, and 1937-1945. The polity2 value from 1862-1910 was always -6 . We coded the polity2 value in 1860-1861 as -6 . The polity2 value from 1914-1948 was always -5 . We coded the polity2 value from 1937-1945 as -5 .
- Japan (ccode 740): has a missing value in 1945. The polity2 value from 1868-1944 is always 1. We coded the polity2 value in 1945 as 1.
- Thailand (ccode 800): has a missing value in 1941. The polity2 value from 1935-1951 is always -3 . We coded the polity2 value in 1941 as -3 .
- Cambodia (ccode 811): has missing values from 1979-1987. The polity2 value from 1976-1978 is always -7 and the polity2 value from 1988-1989 is always 0. We coded the polity2 value to account for the fact that it increased from -7 in 1978 to 0 in 1988 as: -7 in 1979, -6 in 1980, -5 in 1981, -4 in 1982, -3 in 1983, -2 in 1984, -1 in 1985, 0 in 1986, and 0 in 1987.
- Laos (ccode 812): has a missing value for 1953 (the year it enters the state system). The polity2 value in 1954 was 0. We coded the polity2 value in 1953 as 0.
- Republic of Vietnam (ccode 817): has missing values from 1965-1972. The polity2 value from 1954-1975 is always -3 . We coded the polity2 value from 1965-1972 as -3 .

The polity2 variable ranges from -10 to $+10$, to which we add ten, so that the scores range from 0 to 20. States with scores between 16 and 20 (inclusive) are coded as democracies and states with scores between 0 and 4 (inclusive) are coded as autocracies. We then create two binary variables, one that equals 1 if a potential joiner and either initial belligerent are both democratic and 0 otherwise, and one that equals 1 if a potential joiner and either initial belligerent are both autocratic and 0 otherwise.

Alliance

We measure whether a potential joiner has alliance obligations with an initial belligerent using the Alliance Treaty Obligations and Provisions (ATOP) data set (Leeds, Ritter, Mitchell, and Long 2002). The ATOP data set provides the precise obligations undertaken by each member of an alliance, which include defense pacts, offense pacts, neutrality pacts, nonaggression pacts, and consultation pacts. Defense and offense pacts obligate a member of an alliance to provide military assistance in the event of military conflict involving another member of the alliance. In contrast, neutrality, nonaggression, and consultation pacts only obligate members to cooperate short of direct military assistance. However, neutrality pacts involve an explicit promise not to join a conflict against an ally and to not facilitate an adversary's success in the event of a conflict with the ally. As a result, we include defense pacts, offense pacts, and neutrality pacts but exclude nonaggression and consultation pacts.

Since two states that are part of the same alliance do not necessarily undertake symmetric obligations, we coded the obligation of the potential joiner to the initial belligerents of a MID and not vice-versa. For example, ATOP Alliance# 1400 involving the UK (ccode 2) and Portugal (ccode 235) began October 14, 1899 and ended April 4, 1949. In this alliance the UK had a defensive obligation to Portugal but Portugal did not have a defensive obligation to the UK. Thus, our variable that captures Portugal's defensive obligation to the UK is coded as 0 for any MIDs where the UK is an initial belligerent during the time the alliance was in effect. For example, MID# 128, in which the UK was an initial belligerent, began on January 11, 1905 and ended on December 6, 1905. In this MID, Portugal is not coded as having a defensive obligation to the UK. The UK does have a defensive obligation to Portugal but Portugal is a potential joiner in this MID while the UK is an initial belligerent.

An alliance begins and ends during a year. As a result, some alliances are not operative for a full year. Since a potential joiner can join on any day during a MID this creates two problems: 1) it is possible for an alliance to terminate before a MID began or go into effect after a MID ended, and 2) it is possible for an alliance to go into effect during a MID or terminate during a MID. The ATOP data contains a variable that marks whether or not an alliance commitment is in effect for the full year. To address the first problem we examined those MIDs where an alliance transition occurred and checked the start day and month of the alliance(s) using the ATOP id variables and the ATOP member level data set to make sure an alliance was in effect when the MID occurred. In terms of the second problem, if the alliance came into effect during a MID or ended during a MID, we coded the alliance as not being in effect. Thus, unless an alliance obligation was in effect for the full duration of a MID, it is coded as not being in effect even if the alliance later came into effect during the MID. Additionally, an alliance is coded as being in effect if it lasted until a state joined the MID or until a state exited the state system.

- If an alliance began the day a MID began then we coded the alliance as being operative. For example, MID# 3800 began on June 12, 1940 and ended on July 1, 1940. ATOP Alliance# 2505 between the UK (initial belligerent, ccode 200) and Thailand (potential joiner, ccode 800) began on June 12, 1940, thus we coded the neutrality obligation as being operative during this MID.

- If an alliance ended the day a potential joiner exited the state system then we coded the alliance as being operative until the state exited the system. For example, MID# 3801 began on April 1, 1940 and ended on October 18, 1940. However, Estonia (potential joiner, ccode 366) exited the state system on June 16, 1940 and was no longer at risk of joining this MID. ATOP Alliance# 2455 between Germany (initial belligerent, ccode 255) and Estonia began on June 7, 1939 and ended on June 16, 1940, thus we coded the neutrality obligation as being operative during this MID.
- If an alliance ended the day a MID ended then we coded the alliance as being operative. For example, MID# 3825 began on August 28, 1940 and ended on June 22, 1941. ATOP Alliance# 2470 between Germany (initial belligerent, ccode 255) and Russia (potential joiner, ccode 365) began on August 23, 1939 and ended on June 22, 1941, thus we coded the neutrality obligation as being operative during this MID.
- In many cases, there were multiple alliances between an initial belligerent and a potential joiner during a MID. For example, MID# 324 began on March 7, 1915 and ended on November 27, 1916. During this MID, Bulgaria (initial belligerent, ccode 355) and Germany (potential joiner, ccode 255) were involved in two different alliances. ATOP Alliance# 2013 was a defense pact that began on September 6, 1914 and ended on September 30, 1918. ATOP Alliance# 2030 was a defense and offense pact that began on September 6, 1915 and ended on September 30, 1918. In this case we coded the presence of a defense pact between Bulgaria and Germany because there was at least one alliance in which a defense pact was present prior to the onset of the MID and did not end during the MID. We did not code for the presence of an offense pact because the offense pact was part of an alliance (# 2030) that was not in effect when the MID began. Thus, if an initial belligerent and potential joiner were involved in multiple alliances, we coded the presence of an alliance obligation if at least one of the alliance obligations was in effect when the MID began and did not terminate during the MID.
- For some alliances the start or end day of the alliance is missing. In these cases we assumed the start or end day of the alliance occurred on the 15th of the month. For example, MID# 503 began on September 23, 1939 and ended on October 18, 1939. During this MID, Russia (initial belligerent, ccode 365) and Lithuania (potential joiner, ccode 368) were involved in two different alliances. ATOP Alliance# 2185 began on September 28, 1926 and ended in October 1939. We assumed this alliance ended on October 15, 1939. As a result, the neutrality obligation between Russia and Lithuania in this alliance was coded as not being in effect because the alliance ended during the MID. ATOP Alliance# 2485 began in October 1939 and ended on June 15, 1940. We assumed this alliance began on October 15, 1939. As a result, the defensive obligation between Russia and Lithuania in this alliance was coded as not being in effect because the alliance began during the MID.

We create three binary variables for defensive, offensive, and neutrality obligations: 1) one that equals 1 if a potential joiner had a defensive obligation with either initial belligerent and 0 otherwise, 2) one that equals 1 if a potential joiner had an offensive obligation with either initial belligerent and 0 otherwise, and 3) one that equals 1 if a potential joiner had a

neutrality obligation with either initial belligerent and 0 otherwise. We then create a binary variable that equals 1 if a potential joiner had a defensive, offensive, or neutrality obligation with either initial belligerent and 0 otherwise.

Distance to MID Location

We use the MID location (MIDLOC) data set from Braithwaite (2010) to measure the great circle distance from the capital city of each potential joiner to each MID onset location.⁶ This variable relies upon identification of the locus at which a conflict occurs. We utilize location details in the MIDLOC data set in which the approximate location of the first hostilities of a MID is used to proxy the conflict location. Thus, a single location is used to represent each MID.⁷ Following common convention, latitude and longitude point coordinates are recorded for each observation. Latitude is measured as the angular distance, in decimalized degrees (DD), of a point north or south of the equator. Similarly, longitude is measured as the angular distance, in DD, of a point east or west of the prime (Greenwich) meridian. In total, the MIDLOC data set is comprised of recorded onset locations for 2,240 of the 2,332 independent MIDs in the MID 3.0 dataset. Our distance variable measures the great circle distance (in kilometers) between the longitude and latitude coordinates of a potential joiner's capital city and the longitude and latitude coordinates of the MID onset location using the World Geodetic Survey (WGS84) parameters.⁸

As described above, if there were multiple initial belligerents of a MID then we created a set of initiator-target dyads. For example, MID# 50 had three initial belligerents, the US (ccode 2) and Taiwan (ccode 713) on the initiating side and China (ccode 710) on the target side. We created two dyads: a US-China (2-710) dyad and a Taiwan-China (713-710) dyad. However, the MID location for both dyads is the same because we only have a single point location for each MID.

As described above, we split World War II (MID# 258) into two separate MIDs. The first MID (labeled MID# 999) begins on March 25, 1939 where Poland (ccode 290) and Germany (ccode 255) are the initial belligerents. We coded this MID as ending on September 27, 1939 when Poland exits the MID. The MID location used for this MID comes from the MIDLOC data set. This location is the mid-point of the border between Poland and East Prussia. The second MID begins on September 28, 1939 and ends on August 14, 1945, where the UK (ccode 200) and Germany are considered to be the initial belligerents. The location for this MID is Heligoland (off the coast of Germany), where the British and German air forces engaged in combat on September 29, 1939 (New York Times 1939).

⁶There are 43 MIDs that have no MID location data. These MID#'s are: 191, 337, 391, 518, 521, 522, 621, 1203, 1441, 1452, 2208, 2314, 2646, 2647, 2649, 2834, 2840, 2930, 3348, 3503, 3507, 3508, 3509, 3511, 3513, 3514, 3516, 3518, 3519, 3520, 3521, 3522, 3523, 3524, 3525, 3526, 3527, 3563, 3715, 3813, 3826, 3850, and 3877. We lose 51 cases of joining as a result of dropping these MIDs.

⁷The MIDLOC data set contains a single point location to represent the onset of each individual MID between 1816 and 1992. For the 1993-2001 time period, the data are more detailed, identifying a single point location for each individual incident within a MID. For now, we focus solely upon the initial location of the MID in calculating the proximity of conflict to state territories.

⁸We also measured the distance using the Haversine method (Sinnott 1984). We calculated these distances using the `sp` (for WGS84) and `geosphere` (for Haversine) packages in R.

Summary Statistics: All Triads

Number of MIDs: 2,332

Number of MIDs in data set: 1,231 (including the MID we added for WWII)

Table 1: Number of MIDs with Multiple Originators.

Number of Originators	Number of MIDs
2	1,171
3	38
4	11
5	3
6	4
7	1
8	1
9	1
11	1

Number of observations: 211,730

Number of MIDs where a potential joiner joined: 161

Number of cases where a potential joiner joined: 514

Range of number of joiners: 1 to 22 (MID# 4137 had 22 joiners)

Table 2: Summary Statistics.

Variable	Minimum	Maximum	Mean	Standard Deviation	% 0's	% 1's
Capability ^a	0.00001	0.97	0.15	0.21	-	-
Capability ^b	7.56e-07	0.97	0.11	0.18	-	-
Capability ^c	1.09e-07	0.97	0.10	0.17	-	-
Capability ^d	1.09e-07	0.97	0.10	0.17	-	-
Capability ^{bg}	6.44e-08	0.97	0.11	0.18	-	-
Capability ^{cg}	2.67e-08	0.97	0.10	0.17	-	-
Capability ^{dg}	2.65e-08	0.97	0.10	0.17	-	-
Contiguity	0	1	-	-	92.15	7.85
Alliance	0	1	-	-	90.50	9.50
Democracy	0	1	-	-	82.26	17.74
Autocracy	0	1	-	-	70.73	29.27
Distance to MIDLOC ^e	8.49	19989.07	7471.82	4356.04	-	-
Distance to MIDLOC ^f	8.49	20022.23	7470.85	4364.19	-	-
Contiguity x Distance to MIDLOC ^e	0	18859.47	227.84	1144.94	-	-
Contiguity x Distance to MIDLOC ^f	0	19479.77	245.80	1254.56	-	-
Alliance x Distance to MIDLOC ^e	0	19851.21	530.10	2190.82	-	-
Alliance x Distance to MIDLOC ^f	0	19858.83	545.02	2232.22	-	-

^a= No LSG Adjustment

^b= LSG Adjustment Using Distance to Initial Belligerents

^c= LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d= LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e= WGS84 Method

^f= Haversine Method

^g= Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

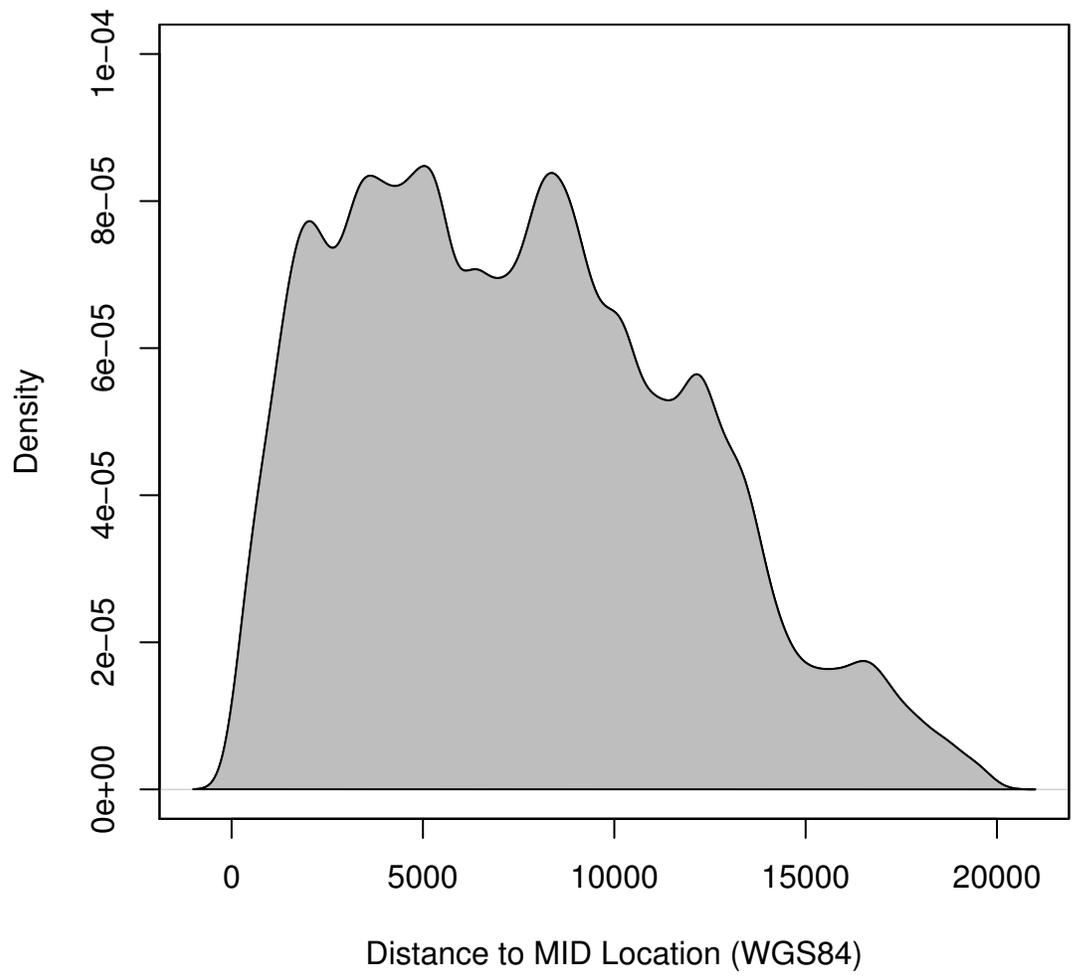


Figure 1: Kernel Density of Distance to MID Location.

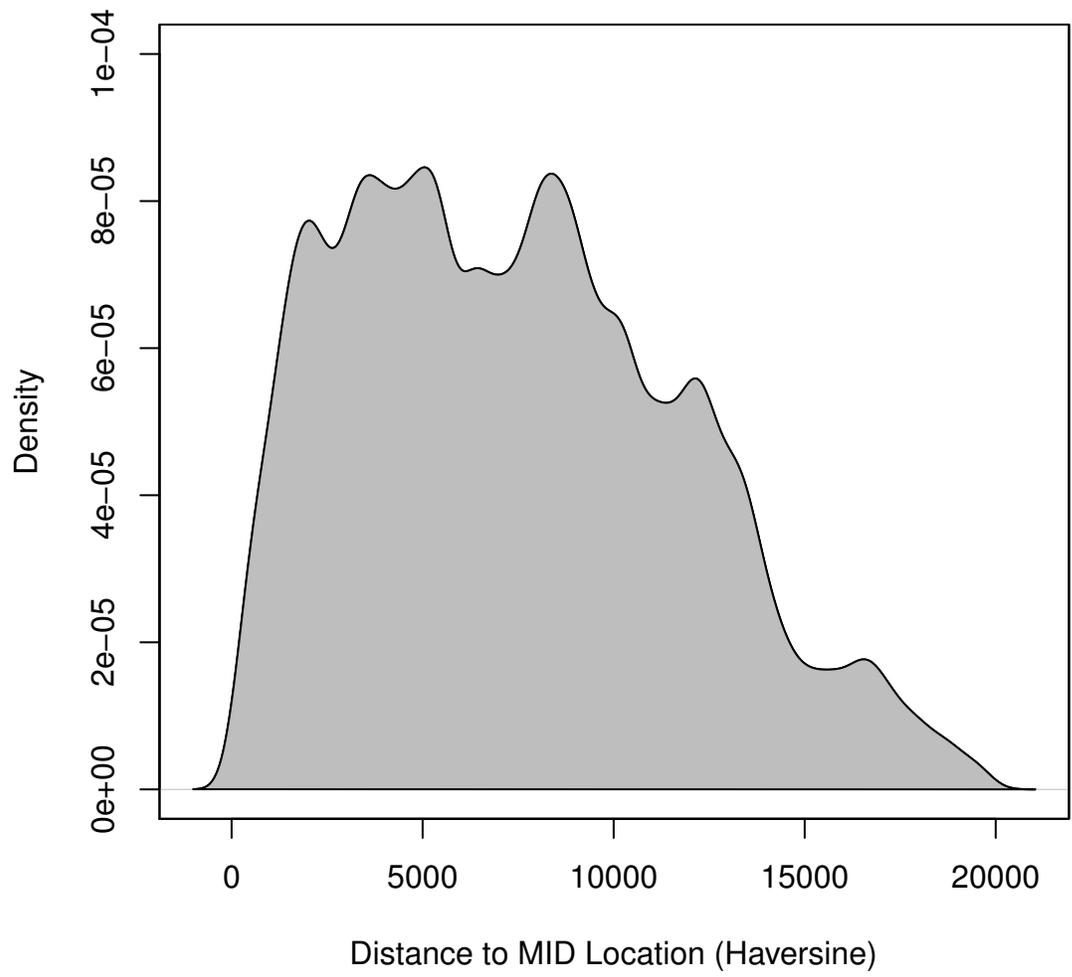


Figure 2: Kernel Density of Distance to MID Location.

Table 3: Correlation Matrix of Independent Variables.

	Capability ^a	Capability ^b	Capability ^c	Capability ^d	Capability ^{b_g}	Capability ^{c_g}	Capability ^{d_g}
Capability ^a	1.00	-	-	-	-	-	-
Capability ^b	0.94	1.00	-	-	-	-	-
Capability ^c	0.93	0.99	1.00	-	-	-	-
Capability ^d	0.93	0.99	0.99	1.00	-	-	-
Capability ^{b_g}	0.93	0.99	0.99	0.99	1.00	-	-
Capability ^{c_g}	0.91	0.99	0.99	0.99	0.99	1.00	-
Capability ^{d_g}	0.91	0.98	0.99	0.99	0.99	0.99	1.00
Contiguity	-0.02	0.05	0.05	0.05	0.05	0.04	0.05
Alliance	-0.03	0.02	0.02	0.02	0.03	0.02	0.02
Democracy	-0.02	0.001	0.003	0.003	0.01	0.01	0.01
Autocracy	-0.04	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Distance to MIDLOC ^e	-0.05	-0.19	-0.20	-0.19	-0.19	-0.20	-0.19
Distance to MIDLOC ^f	-0.04	-0.18	-0.19	-0.20	-0.19	-0.19	-0.20
Contiguity x Distance to MIDLOC ^e	-0.02	0.02	0.003	0.002	0.03	-0.002	-0.002
Contiguity x Distance to MIDLOC ^f	-0.02	0.02	0.004	-0.002	0.03	0.0001	-0.01
Alliance x Distance to MIDLOC ^e	-0.05	-0.02	-0.03	-0.03	-0.02	-0.03	-0.03
Alliance x Distance to MIDLOC ^f	-0.05	-0.02	-0.03	-0.03	-0.02	-0.03	-0.03

^a= No LSG Adjustment

^b= LSG Adjustment Using Distance to Initial Belligerents

^c= LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d= LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e= WGS84 Method

^f= Haversine Method

^g= Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

Table 4: Correlation Matrix of Independent Variables cont.

	Contiguity	Alliance	Democracy	Autocracy	Distance to MIDLOC ^e	Distance to MIDLOC ^f
Capability ^a	-	-	-	-	-	-
Capability ^b	-	-	-	-	-	-
Capability ^c	-	-	-	-	-	-
Capability ^d	-	-	-	-	-	-
Capability ^{bg}	-	-	-	-	-	-
Capability ^{cg}	-	-	-	-	-	-
Capability ^{dg}	-	-	-	-	-	-
Contiguity	1.00	-	-	-	-	-
Alliance	0.22	1.00	-	-	-	-
Democracy	-0.001	0.14	1.00	-	-	-
Autocracy	0.04	0.03	-0.30	1.00	-	-
Distance to MIDLOC ^e	-0.31	-0.14	0.01	-0.12	1.00	-
Distance to MIDLOC ^f	-0.29	-0.13	0.01	-0.11	0.95	1.00
Contiguity x Distance to MIDLOC ^e	0.68	0.17	0.01	0.02	-0.07	-0.06
Contiguity x Distance to MIDLOC ^f	0.67	0.16	0.01	0.02	-0.08	-0.04
Alliance x Distance to MIDLOC ^e	0.06	0.75	0.15	-0.03	0.12	0.12
Alliance x Distance to MIDLOC ^f	0.07	0.75	0.15	-0.03	0.11	0.12

^a = No LSG Adjustment

^b = LSG Adjustment Using Distance to Initial Belligerents

^c = LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d = LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e = WGS84 Method

^f = Haversine Method

^g = Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

Table 5: Correlation Matrix of Independent Variables cont.

	Contiguity x Distance to MIDLOC ^e	Contiguity x Distance to MIDLOC ^f	Alliance x Distance to MIDLOC ^e	Alliance x Distance to MIDLOC ^f
Capability ^a	-	-	-	-
Capability ^b	-	-	-	-
Capability ^c	-	-	-	-
Capability ^d	-	-	-	-
Capability ^{b,g}	-	-	-	-
Capability ^{c,g}	-	-	-	-
Capability ^{d,g}	-	-	-	-
Contiguity	-	-	-	-
Alliance	-	-	-	-
Democracy	-	-	-	-
Autocracy	-	-	-	-
Distance to MIDLOC ^e	-	-	-	-
Distance to MIDLOC ^f	-	-	-	-
Contiguity x Distance to MIDLOC ^e	1.00	-	-	-
Contiguity x Distance to MIDLOC ^f	0.94	1.00	-	-
Alliance x Distance to MIDLOC ^e	0.17	0.15	1.00	-
Alliance x Distance to MIDLOC ^f	0.17	0.17	0.98	1.00

^a= No LSG Adjustment

^b= LSG Adjustment Using Distance to Initial Belligerents

^c= LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d= LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e= WGS84 Method

^f= Haversine Method

^g= Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

Table 6: Summary Statistics for Distance to MID Location for Contiguous and Non-Contiguous Joiners and Potential Joiners.

	Join	\neg Join
Contiguous	N=266 Mean=1,490 Minimum=17 Maximum=13,347	N=16,364 Mean=2,924 Minimum=8 Maximum=18,859
\neg Contiguous	N=248 Mean=5,263 Minimum=53 Maximum=14,837	N=194,852 Mean=7,865 Minimum=52 Maximum=19,989

Table 7: Summary Statistics for Distance to MID Location for Allied and Non-Allied Joiners and Potential Joiners.

	Join	\neg Join
Allied	N=207 Mean=2,906 Minimum=17 Maximum=12,765	N=19,906 Mean=5,608 Minimum=25 Maximum=19,851
\neg Allied	N=307 Mean=3,583 Minimum=66 Maximum=14,837	N=191,310 Mean=7,677 Minimum=8 Maximum=19,989

Summary Statistics: Politically Relevant Triads

A triad is defined as being politically relevant if: 1) the potential joiner is contiguous to one at least one of the initial belligerents, or 2) the potential joiner or one of the initial belligerents is a major power.

Number of politically relevant MIDs in data set: 1,231 (including the MID we added for WWII)

Table 8: Number of MIDs with Multiple Originators.

Number of Originators	Number of MIDs
2	1,171
3	38
4	11
5	3
6	4
7	1
8	1
9	1
11	1

Number of politically relevant triads (observations): 83,273 ($\approx 39\%$ of all triads)

Number of MIDs where a potential joiner joined: 161

Number of cases where a potential joiner joined: 462

Range of number of joiners: 1 to 22 (MID# 4137 had 22 joiners)

Table 9: Summary Statistics.

Variable	Minimum	Maximum	Mean	Standard Deviation	% 0's	% 1's
Capability ^a	0.00001	0.97	0.10	0.20	-	-
Capability ^b	8.70e-07	0.97	0.09	0.19	-	-
Capability ^c	1.09e-07	0.97	0.08	0.18	-	-
Capability ^d	1.09e-07	0.97	0.08	0.18	-	-
Capability ^{bg}	7.84e-08	0.97	0.09	0.19	-	-
Capability ^{cg}	2.67e-08	0.97	0.08	0.18	-	-
Capability ^{dg}	2.65e-08	0.97	0.08	0.18	-	-
Contiguity	0	1	-	-	80.03	19.97
Alliance	0	1	-	-	83.49	16.51
Democracy	0	1	-	-	79.63	20.37
Autocracy	0	1	-	-	71.34	28.66
Distance to MIDLOC ^e	8.49	19939.79	7284.96	4587.73	-	-
Distance to MIDLOC ^f	8.49	19970.71	7321.15	4607.53	-	-
Contiguity x Distance to MIDLOC ^e	0	18859.47	579.32	1769.04	-	-
Contiguity x Distance to MIDLOC ^f	0	19479.77	624.97	1940.43	-	-
Alliance x Distance to MIDLOC ^e	0	19851.21	1063.90	3178.98	-	-
Alliance x Distance to MIDLOC ^f	0	19858.83	1080.49	3209.13	-	-

^a= No LSG Adjustment

^b= LSG Adjustment Using Distance to Initial Belligerents

^c= LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d= LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e= WGS84 Method

^f= Haversine Method

^g= Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

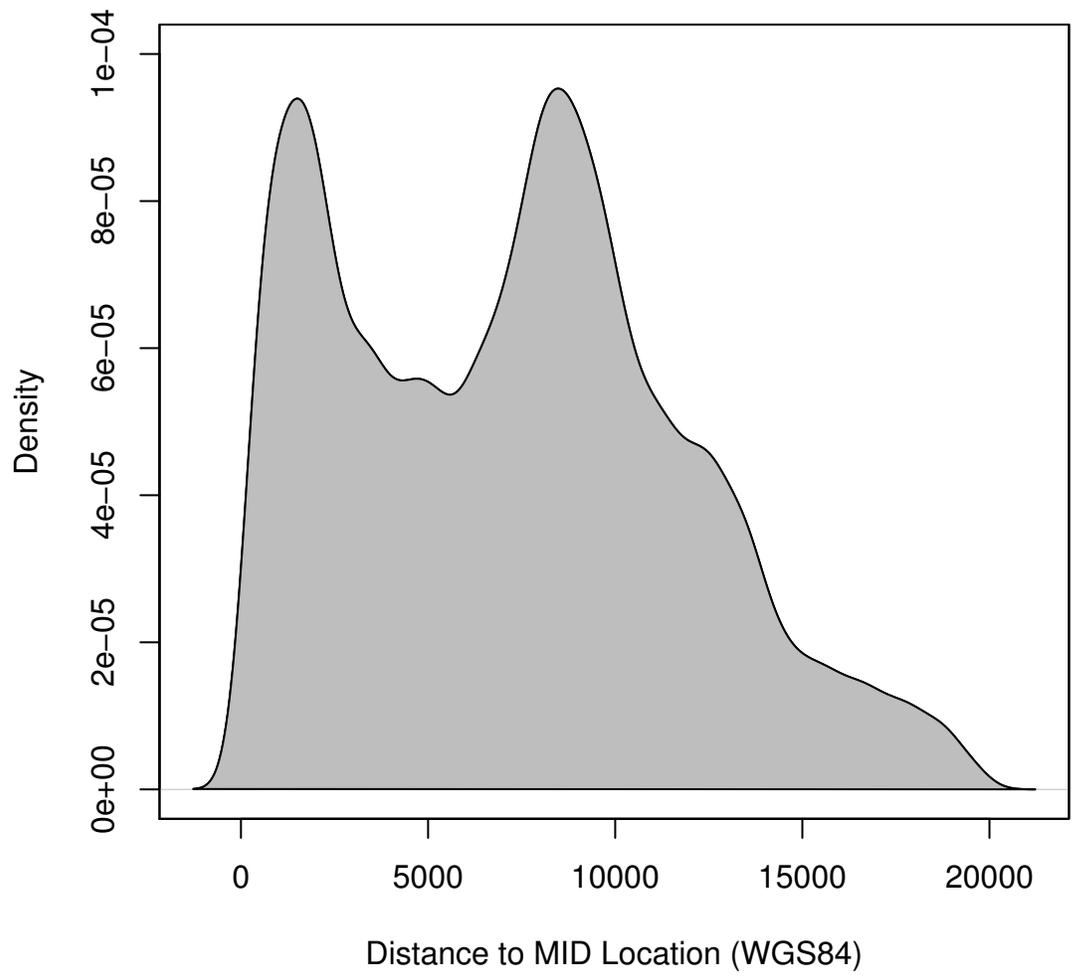


Figure 3: Kernel Density of Distance to MID Location.

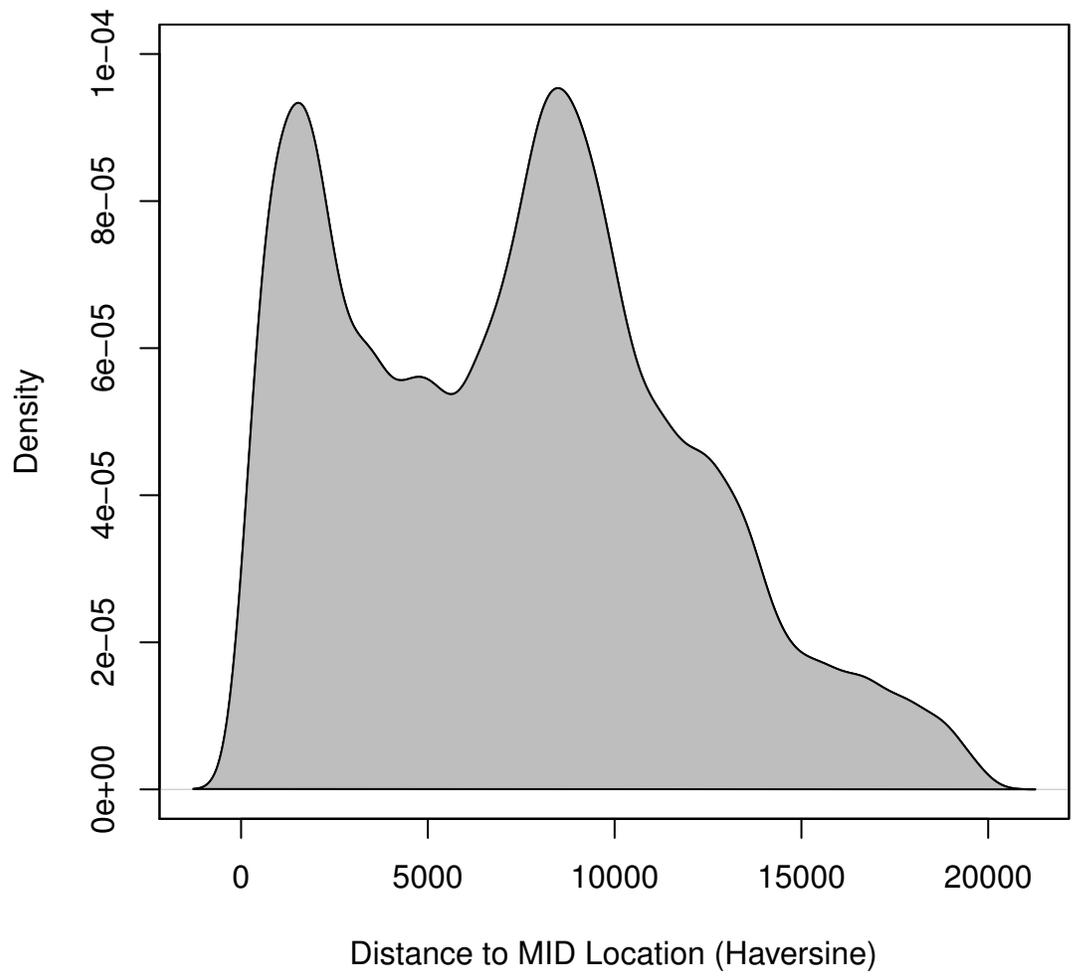


Figure 4: Kernel Density of Distance to MID Location.

Table 10: Correlation Matrix of Independent Variables.

	Capability ^a	Capability ^b	Capability ^c	Capability ^d	Capability ^{b_g}	Capability ^{c_g}	Capability ^{d_g}
Capability ^a	1.00	-	-	-	-	-	-
Capability ^b	0.99	1.00	-	-	-	-	-
Capability ^c	0.98	0.99	1.00	-	-	-	-
Capability ^d	0.98	0.99	0.99	1.00	-	-	-
Capability ^{b_g}	0.98	0.99	0.99	0.99	1.00	-	-
Capability ^{c_g}	0.97	0.99	0.99	0.99	0.99	1.00	-
Capability ^{d_g}	0.97	0.99	0.99	0.99	0.99	0.99	1.00
Contiguity	0.11	0.13	0.13	0.12	0.14	0.12	0.12
Alliance	0.03	0.04	0.03	0.03	0.04	0.04	0.04
Democracy	0.01	0.01	0.002	0.001	0.01	0.01	0.01
Autocracy	-0.05	-0.03	-0.02	-0.02	-0.03	-0.02	-0.02
Distance to MIDLOC ^e	-0.11	-0.15	-0.16	-0.16	-0.15	-0.16	-0.16
Distance to MIDLOC ^f	-0.11	-0.14	-0.15	-0.16	-0.15	-0.15	-0.16
Contiguity x Distance to MIDLOC ^e	0.06	0.07	0.04	0.04	0.08	0.03	0.03
Contiguity x Distance to MIDLOC ^f	0.05	0.07	0.04	0.03	0.08	0.03	0.02
Alliance x Distance to MIDLOC ^e	-0.02	-0.02	-0.03	-0.03	-0.02	-0.03	-0.03
Alliance x Distance to MIDLOC ^f	-0.02	-0.02	-0.03	-0.03	-0.02	-0.03	-0.03

^a= No LSG Adjustment

^b= LSG Adjustment Using Distance to Initial Belligerents

^c= LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d= LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e= WGS84 Method

^f= Haversine Method

^g= Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

Table 11: Correlation Matrix of Independent Variables cont.

	Contiguity	Alliance	Democracy	Autocracy	Distance to MIDLOC ^e	Distance to MIDLOC ^f
Capability ^a	-	-	-	-	-	-
Capability ^b	-	-	-	-	-	-
Capability ^c	-	-	-	-	-	-
Capability ^d	-	-	-	-	-	-
Capability ^{bg}	-	-	-	-	-	-
Capability ^{cg}	-	-	-	-	-	-
Capability ^{dg}	-	-	-	-	-	-
Contiguity	1.00	-	-	-	-	-
Alliance	0.20	1.00	-	-	-	-
Democracy	-0.04	0.20	1.00	-	-	-
Autocracy	0.08	0.01	-0.32	1.00	-	-
Distance to MIDLOC ^e	-0.48	-0.08	-0.002	-0.08	1.00	-
Distance to MIDLOC ^f	-0.45	-0.08	-0.002	-0.08	0.96	1.00
Contiguity x Distance to MIDLOC ^e	0.66	0.15	-0.01	0.04	-0.09	-0.08
Contiguity x Distance to MIDLOC ^f	0.65	0.15	-0.004	0.04	-0.11	-0.05
Alliance x Distance to MIDLOC ^e	-0.01	0.75	0.21	-0.05	0.24	0.24
Alliance x Distance to MIDLOC ^f	-0.01	0.76	0.21	-0.05	0.23	0.24

^a = No LSG Adjustment

^b = LSG Adjustment Using Distance to Initial Belligerents

^c = LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d = LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e = WGS84 Method

^f = Haversine Method

^g = Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

Table 12: Correlation Matrix of Independent Variables cont.

	Contiguity x Distance to MIDLOC ^e	Contiguity x Distance to MIDLOC ^f	Alliance x Distance to MIDLOC ^e	Alliance x Distance to MIDLOC ^f
Capability ^a	-	-	-	-
Capability ^b	-	-	-	-
Capability ^c	-	-	-	-
Capability ^d	-	-	-	-
Capability ^{b,g}	-	-	-	-
Capability ^{c,g}	-	-	-	-
Capability ^{d,g}	-	-	-	-
Contiguity	-	-	-	-
Alliance	-	-	-	-
Democracy	-	-	-	-
Autocracy	-	-	-	-
Distance to MIDLOC ^e	-	-	-	-
Distance to MIDLOC ^f	-	-	-	-
Contiguity x Distance to MIDLOC ^e	1.00	-	-	-
Contiguity x Distance to MIDLOC ^f	0.93	1.00	-	-
Alliance x Distance to MIDLOC ^e	0.14	0.12	1.00	-
Alliance x Distance to MIDLOC ^f	0.14	0.14	0.99	1.00

^a= No LSG Adjustment

^b= LSG Adjustment Using Distance to Initial Belligerents

^c= LSG Adjustment Using Distance to MIDLOC (WGS84 Method)

^d= LSG Adjustment Using Distance to MIDLOC (Haversine Method)

^e= WGS84 Method

^f= Haversine Method

^g= Kilometers Per Day Adjustment in LSG Formula (Moul 1988)

Table 13: Summary Statistics for Distance to MID Location for Contiguous and Non-Contiguous Joiners and Potential Joiners.

	Join	\neg Join
Contiguous	N=266 Mean=1,490 Minimum=17 Maximum=13,347	N=16,364 Mean=2,924 Minimum=8 Maximum=18,859
\neg Contiguous	N=196 Mean=5,455 Minimum=53 Maximum=13,654	N=66,447 Mean=8,388 Minimum=52 Maximum=19,940

Table 14: Summary Statistics for Distance to MID Location for Allied and Non-Allied Joiners and Potential Joiners.

	Join	\neg Join
Allied	N=201 Mean=2,907 Minimum=17 Maximum=12,765	N=13,548 Mean=6,496 Minimum=25 Maximum=19,851
\neg Allied	N=261 Mean=3,376 Minimum=66 Maximum=13,654	N=69,263 Mean=7,467 Minimum=8 Maximum=19,940

Estimated Models

In order to examine the robustness of our results we estimated our models using two different methods for calculating the distance between the capital city of each potential joiner and the MID location and two different samples.

Methods for Calculating Distance to MID Location

We estimated our models using two different methods for calculating the distance between the capital city of each potential joiner and the MID location. The first method is based on the WGS84 parameters and the second method is Haversine (Sinnott 1984). Table 15 compares the results when the loss-of-strength gradient (LSG) is calculated using the WGS84 and Haversine methods, respectively. The first three columns in Table 15 are the same as Table 1 in the article. The fourth column contains the results when the Haversine method is used to calculate distance. The results are nearly identical regardless of whether the WGS84 or Haversine method is used to calculate the distance between the capital city of each potential joiner and the MID location and then used to adjust a third party's capability. Table 16 compares the results when our distance variable is calculated using the WGS84 and Haversine methods, respectively. The first three columns in Table 16 are the same as Table 2 in the article. The fourth and fifth columns contain the results when the Haversine method is used to calculate our distance variable. As with the LSG results, these results are nearly identical regardless of whether the WGS84 or Haversine method is used to calculate the distance between the capital city of each potential joiner and the MID location.

Adjusting Transportation Ranges in Loss-of-Strength Gradient Calculation

We examined the robustness of our results when we change the transportation range part of the loss-of-strength gradient calculation. Recall that Bueno de Mesquita (1981) defines the transportation ranges as ≈ 402 kilometers per day from 1816-1918, ≈ 605 kilometers per day from 1919-45, and ≈ 805 kilometers per day after 1945. We follow the advice of Moul (1988) who suggests that 402 and 605 kilometers per day are too generous for the 1816-1918 and 1919-45 time periods, respectively. We re-estimated the models in the last three columns of Table 15 using the transportation ranges for the 1816-1918 and 1919-45 time periods suggested by Moul (1988). We did not change the transportation range for the 1946 onwards time period. The results in Table 17 are quite similar to the results when the transportation ranges suggested by Bueno de Mesquita (1981) are used.

Duration of MIDs

We examined the robustness of our results when we change the one day threshold for determining which MIDs are included in our sample. In order to do so we dropped all MIDs that lasted less than 10 days. In our data set there are 161 MIDs (13%) that lasted less than 10 days and in those MIDs there were only 3 cases of joining. We re-estimated the models in Tables 1 and 2 in the article. The results can be found in Tables 18 and 19. Overall, the

results are nearly identical regardless of whether we include MIDs that lasted for at least one day or include MIDs that lasted at least ten days.

Unit of Analysis

We examined the robustness of our results when we change the unit of analysis from MID triad year (MID-initiator-target-potential joiner-year) to MID triad (initiator-target-potential joiner). The latter unit of analysis removes any temporal variation within MIDs. We did so by randomly selecting (without replacement) a single observation representing a triad (initiator-target-potential joiner) for each MID. As a result, we lose 60 cases of joining. The results can be found in Tables 20 and 21 below. The only difference that emerges when there is no temporal variation is that the democracy variable (i.e., whether a potential joiner and either initial belligerent are democratic) is statistically significant (at the 10% level) in Model 2 in Table 21. All of our main results remain the same when there is no temporal dimension within MIDs.

Predicted Probabilities (Loss-of-Strength Gradient Models)

We calculate the predicted probability of a third-party joining an ongoing MID for the loss-of-strength gradient models for various configurations of the contiguity and alliance variables as a third party's capability increases. A third party's capability ranges from 0.00001 to 0.97 when we do not adjust for the loss-of-strength gradient, from 7.56e-07 to 0.97 when we adjust a third party's capability based on its distance to the initial belligerents, and from 1.09e-07 to 0.97 when we adjust a third party's capability based on its distance to the MID location. Thus, when calculating the predicted probabilities we vary a third party's capability from 1.09e-07 to 0.97. We calculated predicted probabilities for four configurations of the contiguity and alliance variables: 1) Not Contiguous, Not Allied, 2) Contiguous, Not Allied, 3) Not Contiguous, Allied, 4) Contiguous, Allied. This approach allows us to not only examine how the predicted probability of joining changes as a third party's capability increases for these four configurations but also for what range of a third party's capability the predicted probability remains statistically significant.

In Figures 5 through 8, we show the predicted probability of a third-party joining during an ongoing MID as a third party's capability increases for the four configurations of the contiguity and alliance variables.⁹ The dashed lines correspond to the predicted probability, while the solid lines correspond to the 95 percent confidence interval. The predicted probability is statistically significant when the confidence interval does not include zero. For all configurations of the contiguity and alliance variables the predicted probability is statistically significant, that is, the confidence interval does not include zero across the entire range of a third party's capability, although the confidence intervals for the predicted probabilities

⁹Since the results are nearly identical regardless of whether the WGS84 or Haversine method is used to calculate the distance between the capital city of each potential joiner and the MID location the predicted probabilities shown in Figures 5 through 8 are based on the WGS84 method. Similarly, since the results are nearly identical regardless of which transportation ranges we use for the loss-of-strength gradient calculation the predicted probabilities shown in Figures 5 through 8 are based on Bueno de Mesquita's (1981) transportation ranges.

overlap. While this overlap might suggest there is no difference among the specifications and, therefore, no need to adjust for the LSG either using distance to an initial belligerent or distance to the conflict location, there are theoretically compelling reasons to prefer adjusting capability for distance to MID location. When calculating the predicted probabilities for each of our four configurations, we set both the democracy and autocracy variables equal to 0 since both variables are not statistically significant in any of the models.

- Figure 5 shows the predicted probability of a third-party joining during an ongoing MID when contiguity and alliance are both equal to 0 while a third party's capability varies from its minimum to its maximum.
- Figure 6 shows the predicted probability of a third-party joining during an ongoing MID when contiguity equals 1, alliance equals 0, and a third party's capability varies from its minimum to its maximum.
- Figure 7 shows the predicted probability of a third-party joining during an ongoing MID when contiguity equals 0, alliance equals 1, and a third party's capability varies from its minimum to its maximum.
- Figure 8 shows the predicted probability of a third-party joining during an ongoing MID when contiguity and alliance are both equal to 1 while a third party's capability varies from its minimum to its maximum.
- Figure 9 shows the predicted probability of a third-party joining during an ongoing MID for the four configurations of the contiguity and alliance variables. This figure is the same as Figure 1 in the article except this figure displays both the predicted probabilities and the confidence intervals.

Predicted Probabilities (Conditional Models)

As with any interaction term, it is important to calculate whether a variable's effect is statistically significant across the entire range of the interacted variable (Brambor, Clark, and Golder 2006, Braumoeller 2004, Kam and Franzese 2007). We calculated the predicted probability of a third-party joining an ongoing MID for various configurations of the contiguity and alliance variables as the distance from a potential joiner's capital city to a MID location increases. The distance between the capital city of a potential joiner to a MID location ranges from 8 to 19,990 kilometers. When calculating the predicted probabilities we vary the distance to MID location from 0 to 19,990 kilometers. We calculated predicted probabilities for four configurations of our contiguity and alliance variables: 1) Not Contiguous, Not Allied, 2) Contiguous, Not Allied, 3) Not Contiguous, Allied, 4) Contiguous, Allied. This approach allows us to not only examine how the predicted probability of joining changes as distance to MID location increases for these four configurations but also for what range of distance to MID location the predicted probability remains statistically significant.

In Figures 10 through 13, we show the predicted probability of a third-party joining during an ongoing MID as the distance from a potential joiner's capital city to a MID location increases for the four configurations of the contiguity and alliance variables (these four figures are combined and presented as Figure 2 in the article). These predicted probabilities

are based on Model 3 in Table 16 (and Model 3 in Table 2 in the article).¹⁰ The dashed line corresponds to the predicted probability and the solid lines correspond to the 95 percent confidence interval. The predicted probability is statistically significant when the confidence interval does not include zero. For all configurations of the contiguity and alliance variables the predicted probability is statistically significant, that is, the confidence interval does not include zero across the entire range of the distance to MID location variable. When calculating the predicted probabilities for each of our four configurations, we set the capability variable equal to its mean value and both the democracy and autocracy variables equal to 0 since both variables are not statistically significant.

- Figure 10 shows the predicted probability of a third-party joining during an ongoing MID when contiguity and its interaction with distance to MID location and alliance and its interaction with distance to MID location are all equal to 0 while distance to MID location varies from its minimum to its maximum.
- Figure 11 shows the predicted probability of a third-party joining during an ongoing MID when contiguity equals 1 and its interaction with distance to MID location varies from the minimum to the maximum of distance to MID location, distance to MID location varies from its minimum to its maximum, and alliance and its interaction with distance to MID location are both equal to 0.
- Figure 12 shows the predicted probability of a third-party joining during an ongoing MID when contiguity and its interaction with distance to MID location are both equal to 0, distance to MID location varies from its minimum to its maximum, and alliance equals 1 and its interaction with distance to MID location varies from the minimum to the maximum of distance to MID location.
- Figure 13 shows the predicted probability of a third-party joining during an ongoing MID when contiguity equals 1 and its interaction with distance to MID location varies from the minimum to the maximum of distance to MID location, distance to MID location varies from its minimum to its maximum, and alliance equals 1 and its interaction with distance to MID location varies from the minimum to the maximum of distance to MID location.

Differences Between Distance to MID Location and Distance to Initial Belligerents

The size of the coefficients and predicted probabilities for our distance measures in the loss-of-strength gradient models might give the impression that there is no meaningful substantive difference between using distance to MID location and distance to the initial belligerents. Here, we highlight some of the important differences between these two measures.

We first examined how many MIDs occur at some meaningful distance from either dis-putant and still expand. There are 514 cases of joining in our data set. If “meaningful

¹⁰Since the results are nearly identical regardless of whether the WGS84 or Haversine method is used to calculate the distance between the capital city of each potential joiner and a MID location the predicted probabilities shown in Figures 10 through 13 are based on the WGS84 method.

distance” is defined as 500 km then there were 205 (40%) cases of joining when the distance between a potential joiner and the closest initial belligerent was greater than 500 km. If meaningful distance is defined as 1000 km then there were 151 (29%) cases of joining when the distance between a potential joiner and the closest initial belligerent was greater than 1000 km. Turning to distance to MID location, if meaningful distance is defined as 500 km then there were 429 (84%) cases of joining when the distance between a potential joiner and the MID location was greater than 500 km. If meaningful distance is defined as 1000 km then there were 312 (61%) cases of joining when the distance between a potential joiner and the MID location was greater than 1000 km. In short, a much larger percentage of the joining cases that occur at some meaningful distance are accounted for by distance to MID location as opposed to distance to the closest initial belligerent. This large difference also demonstrates that distance to the initial belligerents and distance to MID location are capturing different aspects of a third party’s decision to join an ongoing conflict.

We then examined the relationship between distance and contiguity. Only 266 (52%) cases of joining occurred when a potential joiner was contiguous to either the initiator or the target. If we consider the cases where a potential joiner was contiguous to either the initiator or the target and define meaningful distance as greater than 500 km then there are 25 (9%) cases of joining when using distance to the closest initial belligerent and 183 (69%) cases of joining when using distance to MID location. If we increase meaningful distance to greater than 1000 km and still consider cases where a potential joiner was contiguous to either initial belligerent then there are 8 (3%) cases of joining if we use distance to the closest initial belligerent and 84 (32%) cases of joining when we use distance to MID location. These results suggest that even in the case whether a third party is contiguous to an initial belligerent, distance to MID location clearly matters more than distance to the closest initial belligerent.

If we consider the joining cases that occurred when the potential joiner is not contiguous to one of the initial belligerents (248 cases, 48%) and define meaningful distance as 500 km then there are 180 (73%) cases of joining if we use distance to the closest initial belligerent and 246 (99%) cases of joining if we use distance to MID location. If we increase meaningful distance to 1000 km and still consider the joining cases where a potential joiner was not contiguous to either initial belligerent then there are 143 (58%) joining cases if we use distance to the closest initial belligerent and 228 (92%) joining cases when we use distance to MID location. These results demonstrate the importance of incorporating distance to MID location into the conflict joining story. By doing so, we are able to explain joining by third parties that are not contiguous to either initial belligerent, which is important because the cases of joining by non-contiguous states is nearly the same as the cases of joining by contiguous states.

Overall, a fair percentage of the cases of joining occurred when there was meaningful distance from a potential joiner and the closest initial belligerent. A much larger percentage of the joining cases occurred at some meaningful distance between a potential joiner and the MID location than a potential joiner and either initial belligerent. This ranking also holds true if we consider potential joiners that are contiguous to an initial belligerent and those that are not. Additionally, distance to MID location clearly matters for states that are contiguous to an initial belligerent and states that are not contiguous to an initial belligerent.

Next, we examined how many MIDs are so geographically remote from either or both

initial belligerents that distance from MID location, rather than distance to the closest initial belligerent, makes a substantive difference for joiners. We calculated the difference between distance to MID location and minimum distance for the 514 cases of joining in our data set. A kernel density plot of the difference between these two measures can be found below (see Figure 14). Of the 514 cases of joining, in 37 (7%) the distance to initial belligerents measure is greater than the distance to MID location measure, while in 477 the distance to MID location measure is greater than the distance to initial belligerents measure. The large difference in these two measures suggests that they are capturing different aspects of distance. Additionally, note that some of the differences are quite large (the largest difference is 13,270 km).

Finally, we examined other states with a smaller “geographical footprint” in order to examine whether the difference between distance to MID location and distance to the initial belligerents makes a substantive difference for potential joiners, in particular major powers. Specifically, we looked at MIDs in Central America. Of the 1,231 MIDs in our data set, 39 are jointly Central American MIDs (we define Central America as consisting of Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama). Figure 15 shows a kernel density plot of the difference between distance to MID location and minimum distance for the 39 jointly Central American MIDs. This plot shows that these two measures are capturing different aspects of distance. Overall, for most potential joiners the distance to MID location is higher than distance to the initial belligerents suggesting that it could make a substantive difference for some potential joiners.

Of these 39 Central American MIDs, 8 expanded to include additional states. In the 8 MIDs that expanded there are 11 cases of joining. The US is the most frequent joiner having joined in 5 MIDs. In 3 of those MIDs there was little difference between the distance to MID location and distance to the initial belligerents, in the other MIDs the difference was 1783 km and 2000 km, respectively, a distance that could be described as meaningful. There is one instance of Mexico joining and in that case the distance to the closest initial belligerent was 0 (since Mexico is contiguous to Guatemala) but the distance to MID location is 1154 km, again, a distance that could be thought of as meaningful. The other 5 cases of joining all consist of other Central American states. In these cases the difference between the distance to initial belligerents and the distance to MID location measure ranges from 0 km (for potential joiners contiguous to an initial belligerent) to 473 km. Overall, these statistics suggest that the two distance measures are different and while in some cases these differences are small, in a few others the differences are large enough that they could make a substantive difference.

Table 15: Models of Third-Party Joining (1816-2001) Using Different Loss-of-Strength Gradient Specifications.

	<i>No LSG Adjustment</i>	<i>LSG Adjustment Using Distance to Initial Belligerents</i>	<i>LSG Adjustment Using Distance to MID Location^a</i>	<i>LSG Adjustment Using Distance to MID Location^b</i>
Capability	2.09** (0.18)	2.41** (0.18)	2.52** (0.18)	2.54** (0.18)
Contiguity	2.23** (0.11)	2.14** (0.10)	2.14** (0.10)	2.14** (0.10)
Alliance	1.18** (0.11)	1.15** (0.11)	1.15** (0.11)	1.16** (0.11)
Democracy	0.12 (0.12)	0.10 (0.12)	0.11 (0.12)	0.11 (0.12)
Autocracy	-0.04 (0.10)	-0.05 (0.10)	-0.06 (0.10)	-0.06 (0.10)
Intercept	-7.27** (0.08)	-7.22** (0.08)	-7.20** (0.08)	-7.21** (0.08)
N	211,730	211,730	211,730	211,730
-2×Log-Likelihood	6282.73	6248.18	6240.67	6238.08
Likelihood Ratio $\chi^2_{(5,5,5,5)}$	1562.88**	1697.35**	1683.75**	1683.08**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

Coefficients with robust standard errors in parentheses.

^a= WGS84 Method.

^b= Haversine Method.

Table 16: Models of Third-Party Joining (1816-2001) Using Different Distance to MID Location Specifications.

	<i>Model 1</i>	<i>Model 2^a</i>	<i>Model 3^a</i>	<i>Model 4^b</i>	<i>Model 5^b</i>
Capability	2.52** (0.18)	2.25** (0.19)	2.27** (0.19)	2.26** (0.19)	2.27** (0.19)
Contiguity	2.14** (0.10)	1.55** (0.11)	1.99** (0.16)	1.59** (0.11)	1.92** (0.16)
Contiguity x Distance			-0.0002** (0.00006)		-0.0001** (0.00005)
Alliance	1.15** (0.11)	1.05** (0.10)	0.63** (0.14)	1.06** (0.10)	0.61** (0.14)
Alliance x Distance			0.0002** (0.00003)		0.0002** (0.00003)
Distance		-0.0002** (0.00002)	-0.0002** (0.00002)	-0.0002** (0.00002)	-0.0002** (0.00003)
Democracy	0.11 (0.12)	0.15 (0.12)	0.09 (0.12)	0.15 (0.12)	0.09 (0.12)
Autocracy	-0.06 (0.10)	-0.11 (0.10)	-0.07 (0.10)	-0.11 (0.10)	-0.08 (0.10)
Intercept	-7.20** (0.08)	-6.10** (0.13)	-6.12** (0.15)	-6.13** (0.13)	-6.09** (0.15)
N	211,730	211,730	211,730	211,730	211,730
-2×Log-Likelihood	6240.67	6114.13	6077.91	6113.63	6081.50
Likelihood Ratio $\chi^2_{(5,6,8,6,8)}$	1683.75**	1506.55**	1430.69**	1542.24**	1400.57**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

Coefficients with robust standard errors in parentheses.

^a= WGS84 Method.

^b= Haversine Method.

Table 17: Models of Third-Party Joining (1816-2001) Using Different Loss-of-Strength Gradient Specifications with Modified Transportation Ranges.

	<i>LSG Adjustment Using Distance to Initial Belligerents</i>	<i>LSG Adjustment Using Distance to MID Location^a</i>	<i>LSG Adjustment Using Distance to MID Location^b</i>
Capability	2.39** (0.18)	2.49** (0.18)	2.51** (0.18)
Contiguity	2.14** (0.10)	2.15** (0.10)	2.15** (0.10)
Alliance	1.14** (0.11)	1.14** (0.11)	1.15** (0.11)
Democracy	0.09 (0.12)	0.09 (0.12)	0.09 (0.12)
Autocracy	-0.05 (0.10)	-0.07 (0.10)	-0.07 (0.10)
Intercept	-7.21** (0.08)	-7.18** (0.08)	-7.18** (0.08)
N	211,730	211,730	211,730
-2×Log-Likelihood	6251.25	6248.57	6245.99
Likelihood Ratio $\chi^2_{(5,5,5)}$	1688.11**	1662.78**	1662.00**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

Coefficients with robust standard errors in parentheses.

^a= WGS84 Method.

^b= Haversine Method.

Table 18: Logit Models of Third-Party Joining (1816-2001) Using Different Loss-of-Strength Gradient Specifications for MIDs that Lasted Longer than 10 Days.

	<i>No LSG Adjustment</i>	<i>LSG Adjustment Using Distance to Initial Belligerents</i>	<i>LSG Adjustment Using Distance to MID Location</i>
Capability	2.07** (0.18)	2.39** (0.18)	2.50** (0.18)
Contiguity	2.20** (0.11)	2.12** (0.10)	2.11** (0.10)
Alliance	1.24** (0.11)	1.21** (0.11)	1.21** (0.11)
Democracy	0.13 (0.12)	0.11 (0.12)	0.12 (0.12)
Autocracy	-0.04 (0.10)	-0.05 (0.10)	-0.06 (0.10)
Intercept	-7.18** (0.08)	-7.14** (0.08)	-7.12** (0.08)
N	193,647	193,647	193,647
$-2 \times \text{Log-Likelihood}$	6155.44	6121.68	6114.68
Likelihood Ratio $\chi^2_{(5,5,5)}$	1564.35**	1691.19**	1677.74**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.
Coefficients with robust standard errors in parentheses.

Table 19: Logit Models of Third-Party Joining (1816-2001) Using Different Distance to MID Location Specifications for MIDs that Lasted Longer than 10 Days.

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Capability	2.50** (0.18)	2.24** (0.20)	2.25** (0.20)
Contiguity	2.11** (0.10)	1.54** (0.11)	1.97** (0.16)
Contiguity x Distance			-0.0002** (0.00006)
Alliance	1.21** (0.11)	1.10** (0.11)	0.67** (0.14)
Alliance x Distance			0.0002** (0.00003)
Distance		-0.0002** (0.00002)	-0.0002** (0.00002)
Democracy	0.12 (0.12)	0.15 (0.12)	0.10 (0.12)
Autocracy	-0.06 (0.10)	-0.11 (0.10)	-0.07 (0.10)
Intercept	-7.12** (0.08)	-6.05** (0.13)	-6.05** (0.15)
N	193,647	193,647	193,647
-2×Log-Likelihood	6114.68	5995.18	5958.90
Likelihood Ratio $\chi^2_{(5,6,8)}$	1677.74**	1505.94**	1413.28**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.
Coefficients with robust standard errors in parentheses.

Table 20: Logit Models of Third-Party Joining (1816-2001) Using Different Loss-of-Strength Gradient Specifications for MIDs Using Potential Joiner MID as the Unit of Analysis.

	<i>No LSG Adjustment</i>	<i>LSG Adjustment Using Distance to Initial Belligerents</i>	<i>LSG Adjustment Using Distance to MID Location</i>
Capability	2.12** (0.18)	2.44** (0.18)	2.56** (0.18)
Contiguity	2.24** (0.11)	2.15** (0.11)	2.15** (0.11)
Alliance	1.11** (0.12)	1.08** (0.11)	1.08** (0.11)
Democracy	0.18 (0.12)	0.16 (0.12)	0.17 (0.12)
Autocracy	-0.07 (0.11)	-0.08 (0.11)	-0.09 (0.11)
Intercept	-6.94** (0.09)	-6.89** (0.08)	-6.87** (0.08)
N	133,422	133,422	133,422
$-2 \times \text{Log-Likelihood}$	5261.58	5228.85	5221.93
Likelihood Ratio $\chi^2_{(5,5,5)}$	1402.71**	1539.53**	1523.81**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.
Coefficients with robust standard errors in parentheses.

Table 21: Logit Models of Third-Party Joining (1816-2001) Using Different Distance to MID Location Specifications for MIDs Using Potential Joiner MID as the Unit of Analysis.

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Capability	2.56** (0.18)	2.30** (0.20)	2.32** (0.20)
Contiguity	2.15** (0.11)	1.56** (0.11)	2.01** (0.17)
Contiguity x Distance			-0.0002** (0.00007)
Alliance	1.08** (0.11)	0.97** (0.11)	0.53** (0.14)
Alliance x Distance			0.0002** (0.00003)
Distance		-0.0002** (0.00002)	-0.0002** (0.00003)
Democracy	0.17 (0.12)	0.21† (0.12)	0.17 (0.12)
Autocracy	-0.09 (0.11)	-0.15 (0.11)	-0.12 (0.11)
Intercept	-6.87** (0.08)	-5.75** (0.14)	-5.77** (0.15)
N	133,422	133,422	133,422
-2×Log-Likelihood	5221.93	5107.05	5073.25
Likelihood Ratio $\chi^2_{(5,6,8)}$	1523.81**	1384.82**	1318.76**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.
Coefficients with robust standard errors in parentheses.

Not Contiguous, Not Allied

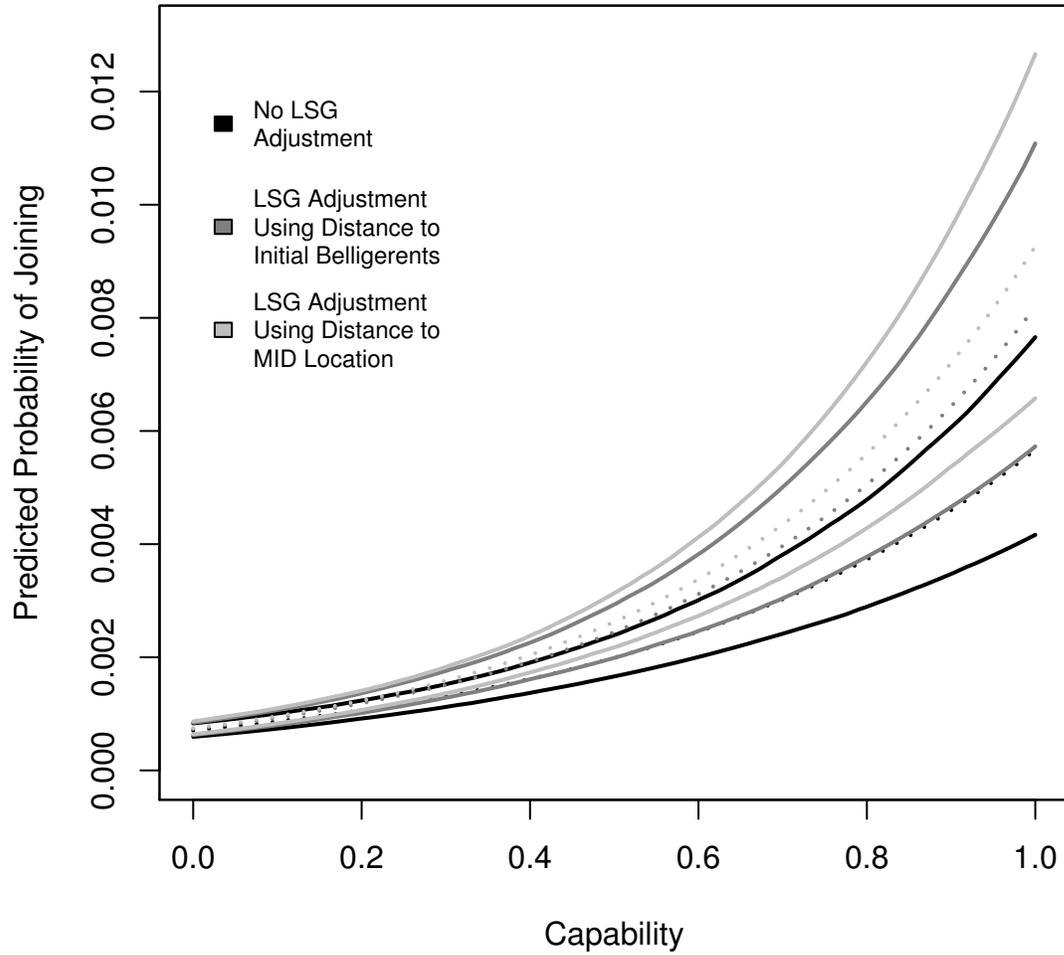


Figure 5: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Capability Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Contiguous, Not Allied

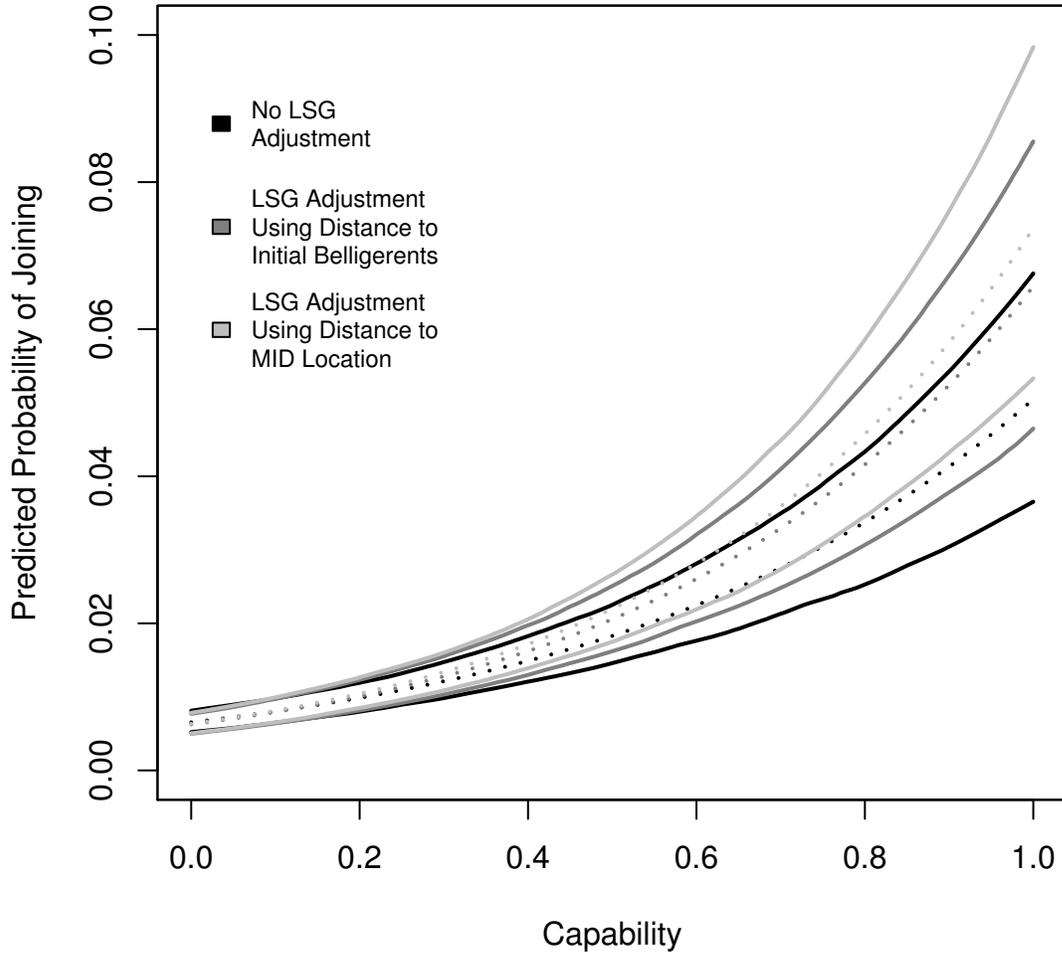


Figure 6: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Capability Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Not Contiguous, Allied

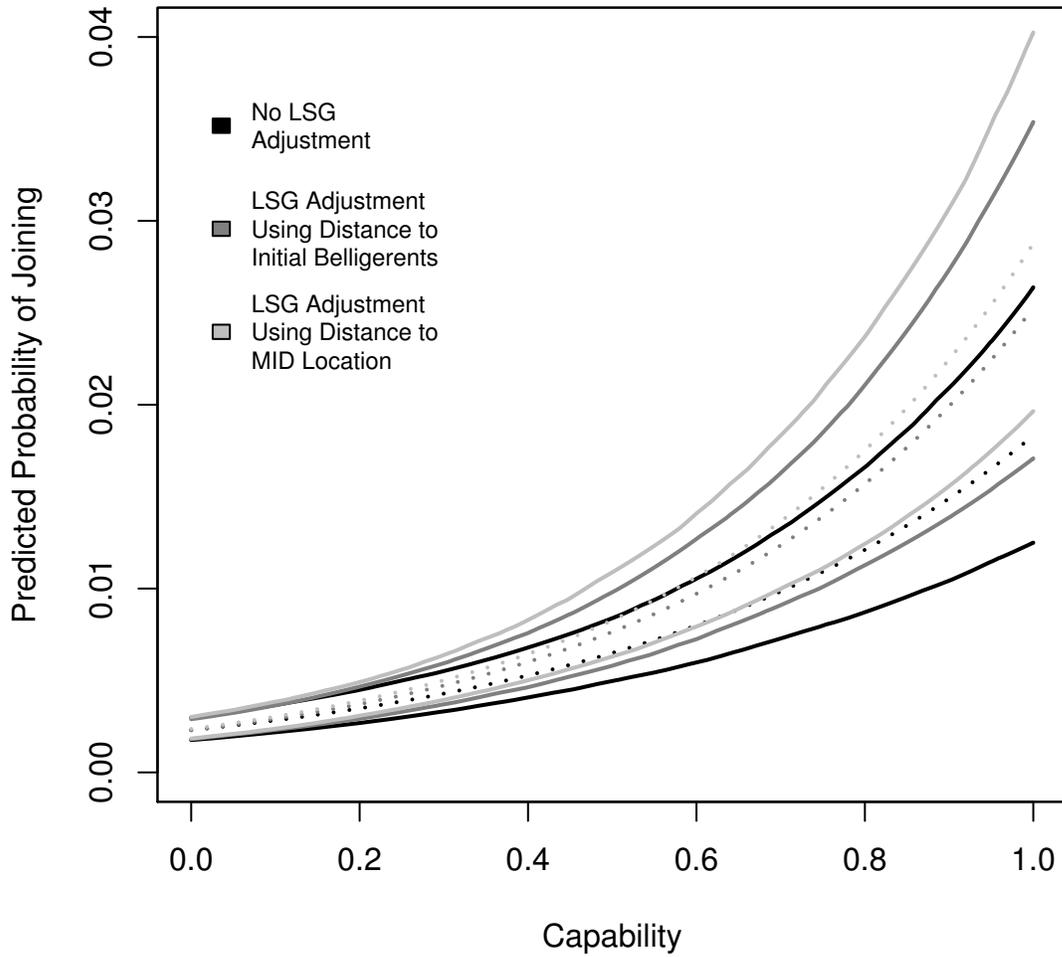


Figure 7: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Capability Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Contiguous, Allied

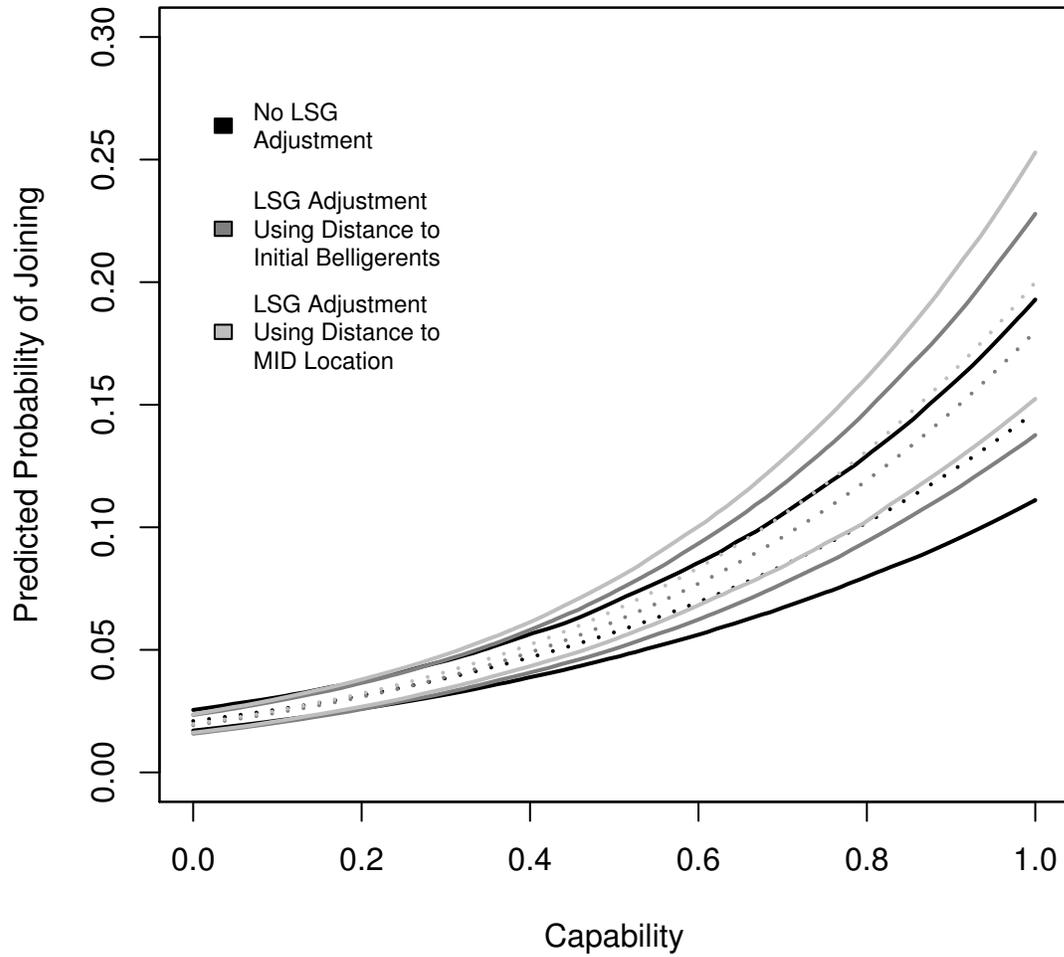


Figure 8: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Capability Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

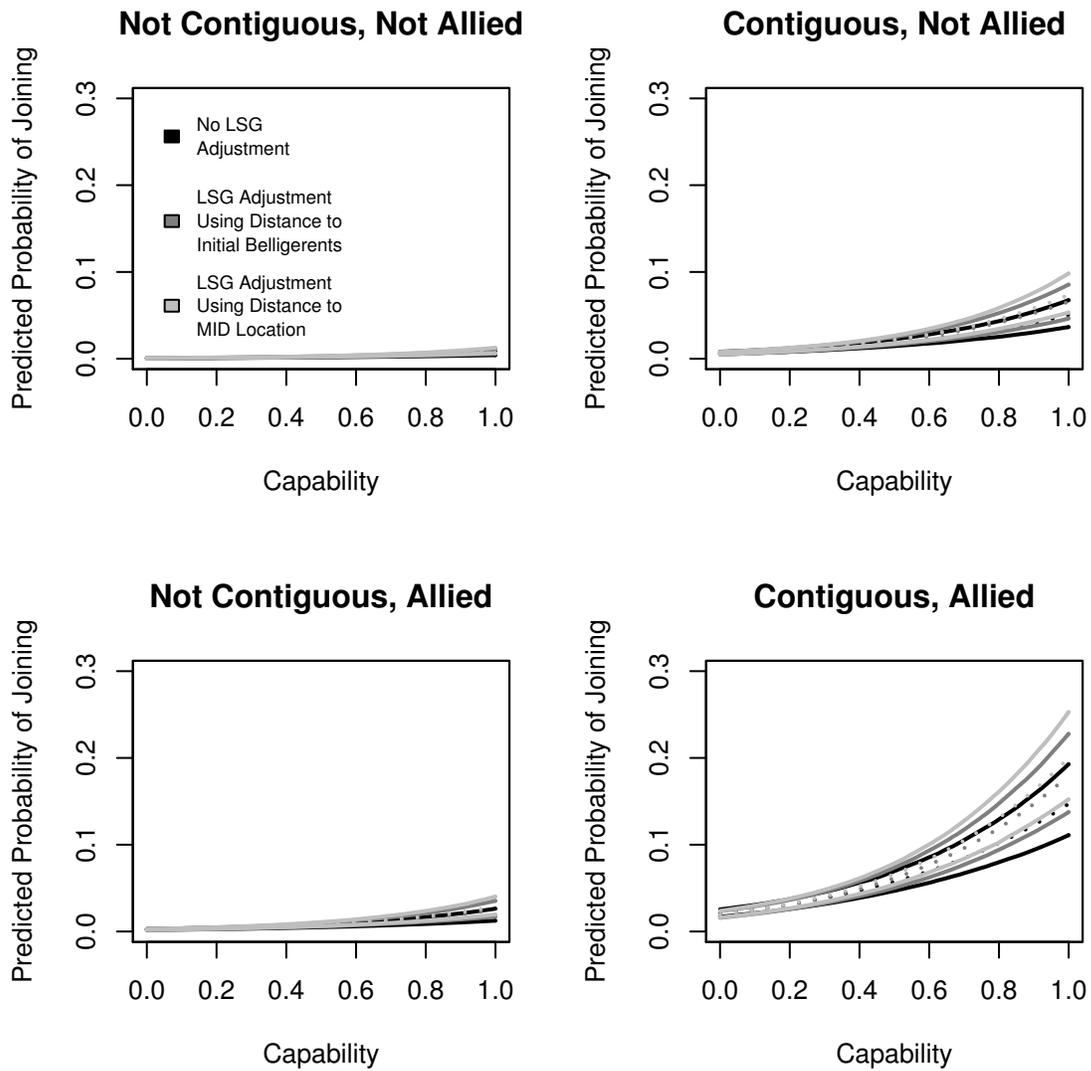


Figure 9: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Capability Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Not Contiguous, Not Allied

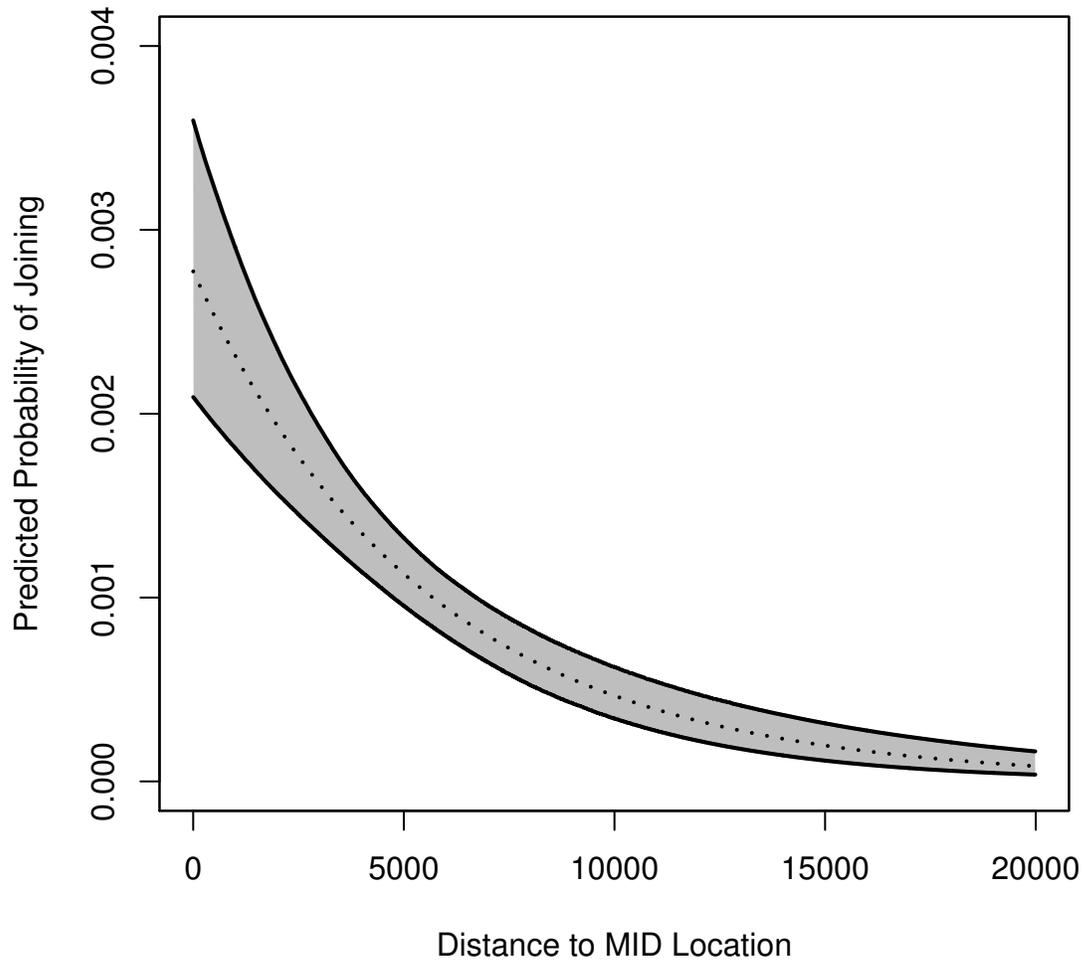


Figure 10: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Distance to a MID Location Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Contiguous, Not Allied

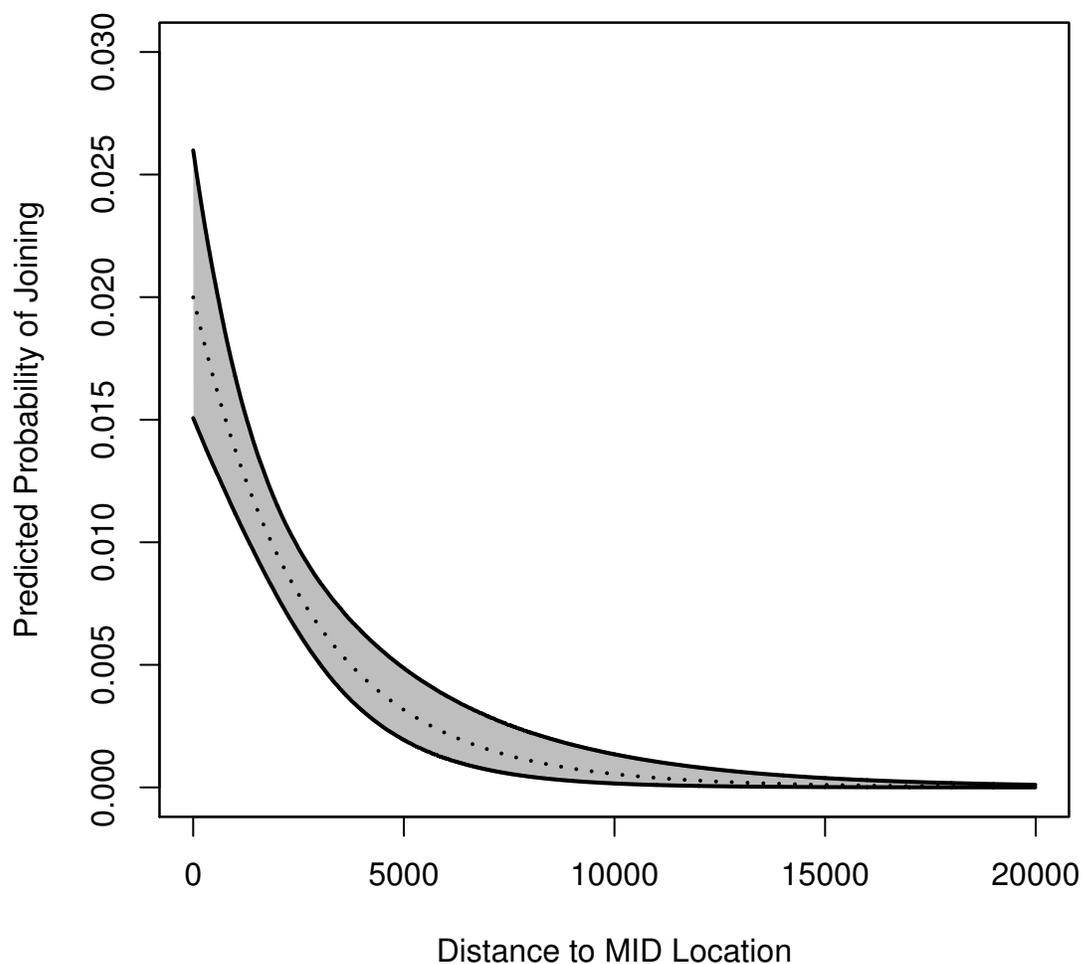


Figure 11: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Distance to a MID Location Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Not Contiguous, Allied

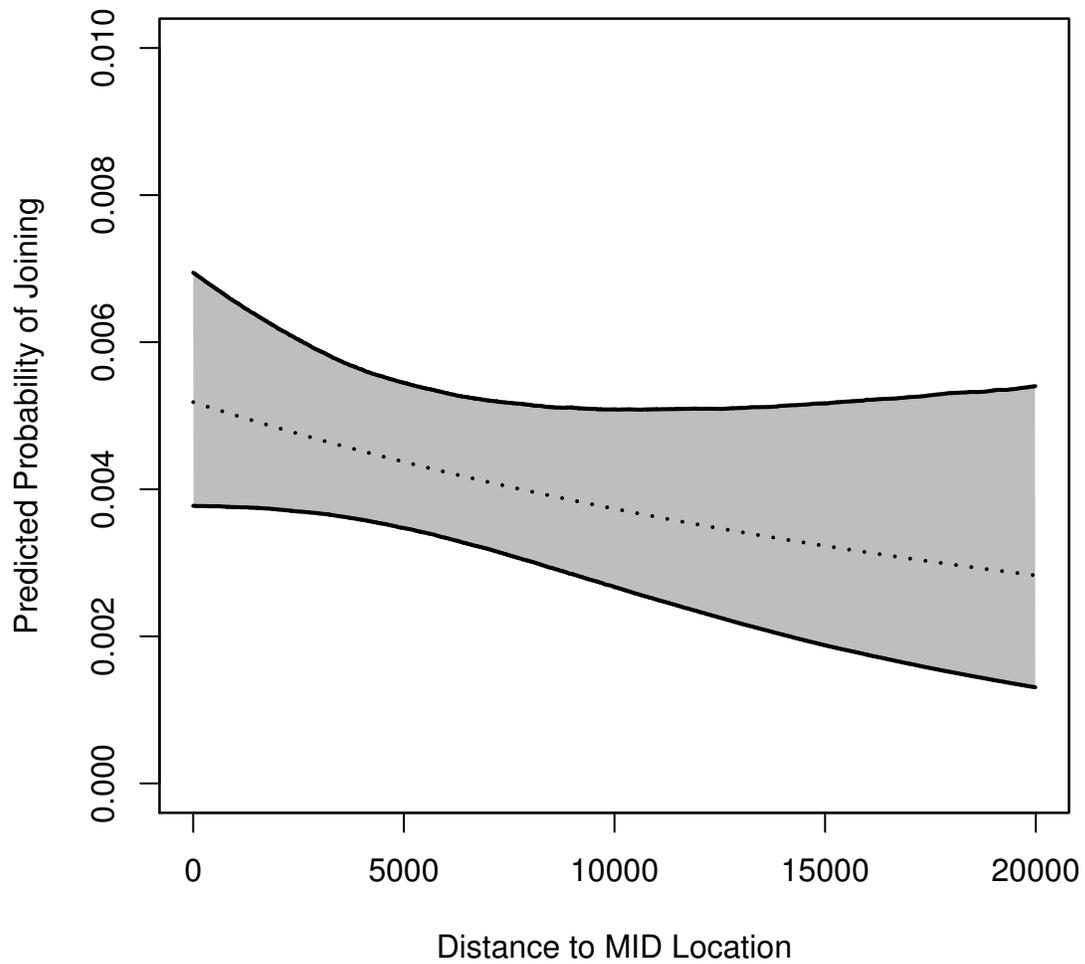


Figure 12: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Distance to a MID Location Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

Contiguous, Allied

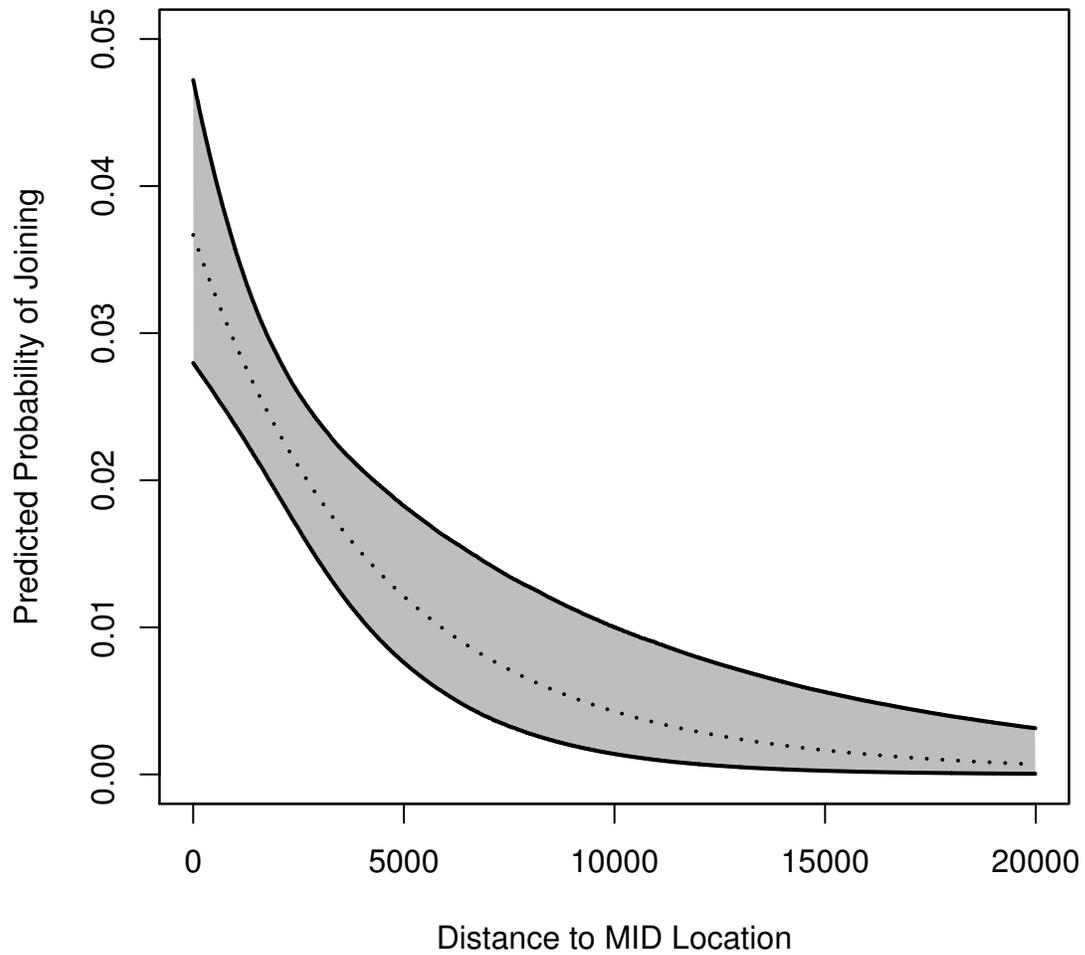


Figure 13: Predicted Probability of a Third-Party Joining an Ongoing MID as a Third Party's Distance to a MID Location Increases. The dashed line corresponds to the predicted probability, while the solid lines correspond to the 95 percent confidence interval.

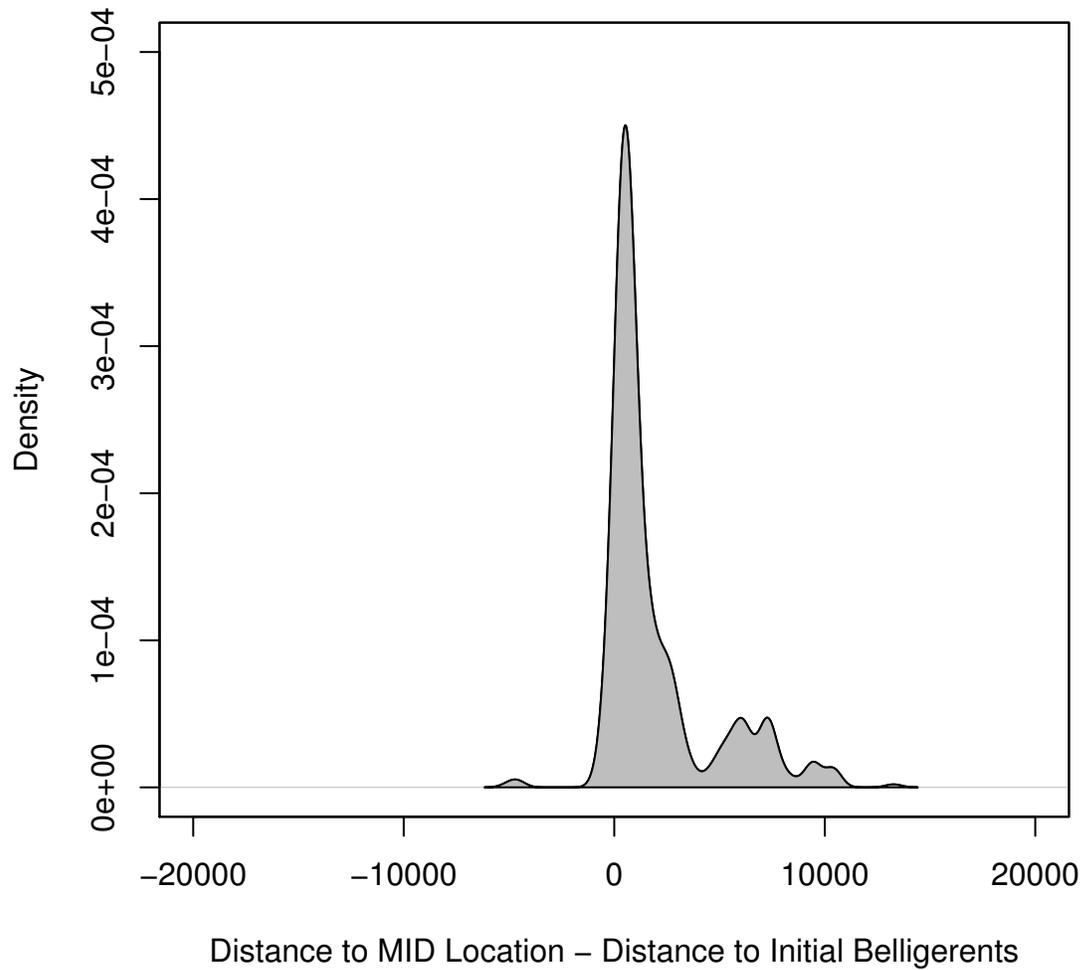


Figure 14: Kernel Density of the Difference between Distance to MID Location and Distance to Initial Belligerents in MIDs that Expanded. Note: positive values indicate that the distance to MID Location is greater than the distance to initial belligerents.

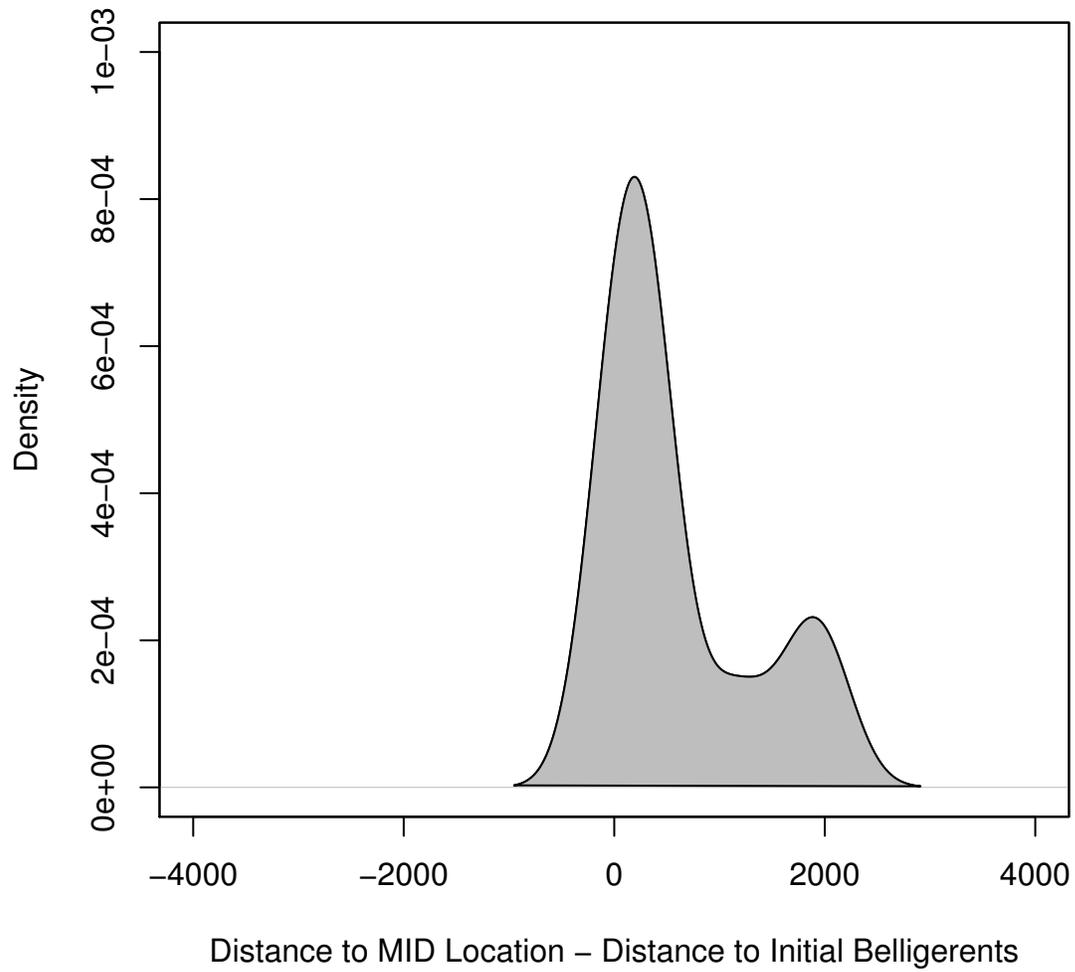


Figure 15: Kernel Density of the Difference between Distance to MID Location and Distance to Initial Belligerents in Central American MIDs. Note: positive values indicate that the distance to MID Location is greater than the distance to initial belligerents.

Politically Relevant Triads

We estimated our models using two different samples: all triads and politically relevant triads. A triad is defined as being politically relevant if: 1) the potential joiner is contiguous to at least one of the initial belligerents, or 2) the potential joiner or one of the initial belligerents is a major power (Reiter and Stam 2002). We use politically relevant triads to see if our results are robust when we exclude those third parties for which there is only a small probability of joining. Politically relevant triads account for about 39 percent of all triads. For each year in each MID we include the triads that meet the two conditions defining a politically relevant triad.¹¹

Our sample includes 1,231 politically relevant MIDs and 83,273 politically relevant triad years (observations). Our politically relevant sample includes 462 cases of joining. We lose few joining cases (52) by limiting the set of all potential joiners to the politically relevant ones. This suggests that contiguous states and/or major powers account for most of the joining.

In general, the results are fairly robust regardless of which sample is used. The results for the full sample of triads are shown in Tables 15 and 16 (these are the same as Tables 1 and 2 in the article), while Tables 22 and 23 show the results for the politically relevant triads sample. Tables 24 and 25 contain a summary of the results across the two samples with variable effects that are not consistent across the samples in bold. Below we describe how the results change across the samples.

In Table 24 the only variable that is not consistent across the two samples is autocracy, which is always negative in the all triads sample and always positive in the politically relevant triads sample. However, in neither sample is the effect for autocracy statistically significant.

In Table 25 there are two variables that are not consistent across the two samples. First, the effect of autocracy is negative in Models 1, 3, and 5 in the all triads sample but positive in the same models in the politically relevant triads sample. However, in neither sample is the effect of autocracy statistically significant. Second, the effect of the interaction between contiguity and distance is negative and significant at the 0.01 level in Models 3 and 5 in the all triads sample but negative and significant at the 0.05 level in Model 3 and negative and not significant in Model 5 in the politically relevant triads sample.

¹¹If there were multiple initial belligerents then we created a separate dyad for each initial belligerent pairing. For each initial belligerent pairing we included all potential joiners that met the two conditions defining a politically relevant triad for each year of a MID.

Table 22: Models of Third-Party Joining (1816-2001) Using Different Loss-of-Strength Gradient Specifications: Politically Relevant Triads.

	<i>No LSG Adjustment</i>	<i>LSG Adjustment Using Distance to Initial Belligerents</i>	<i>LSG Adjustment Using Distance to MID Location^a</i>	<i>LSG Adjustment Using Distance to MID Location^b</i>
Capability	2.33** (0.16)	2.39** (0.16)	2.46** (0.16)	2.48** (0.16)
Contiguity	1.42** (0.10)	1.38** (0.10)	1.39** (0.10)	1.40** (0.10)
Alliance	0.99** (0.10)	0.99** (0.10)	0.99** (0.10)	0.99** (0.10)
Democracy	0.12 (0.12)	0.11 (0.12)	0.12 (0.12)	0.12 (0.12)
Autocracy	0.04 (0.11)	0.03 (0.11)	0.01 (0.11)	0.01 (0.11)
Intercept	-6.43** (0.09)	-6.40** (0.09)	-6.38** (0.09)	-6.39** (0.09)
N	83,273	83,273	83,273	83,273
-2×Log-Likelihood	5156.59	5153.62	5150.51	5147.99
Likelihood Ratio $\chi^2_{(5,5,5,5)}$	954.14**	971.21**	953.10**	954.78**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

Coefficients with robust standard errors in parentheses.

^a = WGS84 Method.

^b = Haversine Method.

Table 23: Models of Third-Party Joining (1816-2001) Using Different Distance to MID Location Specifications: Politically Relevant Triads.

	<i>Model 1</i>	<i>Model 2^a</i>	<i>Model 3^a</i>	<i>Model 4^b</i>	<i>Model 5^b</i>
Capability	2.46** (0.16)	2.29** (0.17)	2.30** (0.17)	2.29** (0.17)	2.30** (0.17)
Contiguity	1.39** (0.10)	0.55** (0.11)	0.87** (0.17)	0.60** (0.12)	0.79** (0.17)
Contiguity x Distance			-0.0001* (0.00007)		-0.0001 (0.00006)
Alliance	0.99** (0.10)	0.95** (0.10)	0.69** (0.14)	0.96** (0.10)	0.66** (0.14)
Alliance x Distance			0.0001** (0.00003)		0.0001** (0.00003)
Distance		-0.0002** (0.00002)	-0.0002** (0.00003)	-0.0002** (0.00002)	-0.0002** (0.00003)
Democracy	0.12 (0.12)	0.13 (0.12)	0.10 (0.12)	0.14 (0.12)	0.09 (0.12)
Autocracy	0.01 (0.11)	-0.02 (0.11)	0.01 (0.11)	-0.02 (0.11)	0.04 (0.11)
Intercept	-6.38** (0.09)	-5.05** (0.14)	-5.08** (0.15)	-5.09** (0.14)	-5.03** (0.15)
N	83,273	83,273	83,273	83,273	83,273
-2×Log-Likelihood	5150.51	4998.83	4983.44	4999.23	4986.49
Likelihood Ratio $\chi^2_{(5,6,8,6,8)}$	953.10**	933.62**	898.92**	953.25**	870.74**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

Coefficients with robust standard errors in parentheses.

^a= WGS84 Method.

^b= Haversine Method.

Table 24: Summary of Results Across Samples For Different Loss-of-Strength Gradient Specifications.

	<i>No LSG Adjustment</i>	<i>LSG Adjustment Using Distance to Initial Belligerents</i>	<i>LSG Adjustment Using Distance to MID Location^a</i>	<i>LSG Adjustment Using Distance to MID Location^b</i>
Capability	All	+	+	+
	Politically Relevant	+	+	+
Contiguity	All	+	+	+
	Politically Relevant	+	+	+
Alliance	All	+	+	+
	Politically Relevant	+	+	+
Democracy	All	+	+	+
	Politically Relevant	+	+	+
Autocracy	All	-	-	-
	Politically Relevant	+	+	+

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

^a= WGS84 Method.

^b= Haversine Method.

Table 25: Summary of Results Across Samples for Different Distance to MID Location Specifications.

	<i>Model 1</i>	<i>Model 2^a</i>	<i>Model 3^a</i>	<i>Model 4^b</i>	<i>Model 5^b</i>
Capability	+	+	+	+	+
	**	**	**	**	**
Politically Relevant	+	+	+	+	+
	**	**	**	**	**
Contiguity	+	+	+	+	+
	**	**	**	**	**
Politically Relevant	+	+	+	+	+
	**	**	**	**	**
Contiguity x Distance			-		-
			**		**
Politically Relevant			-		-
			*		*
Alliance	+	+	+	+	+
	**	**	**	**	**
Politically Relevant	+	+	+	+	+
	**	**	**	**	**
Alliance x Distance			+		+
			**		**
Politically Relevant			+		+
			**		**
Distance			+		+
			**		**
Politically Relevant			-		-
			**		**
Democracy	+	+	+	+	+
	**	**	**	**	**
Politically Relevant	+	+	+	+	+
	**	**	**	**	**
Autocracy	-	-	-	-	-
	**	**	**	**	**
Politically Relevant	+	+	+	+	+
	**	**	**	**	**

Notes: Significance levels (two-tailed): †: 10% *: 5% **: 1%.

^a= WGS84 Method.

^b= Haversine Method.

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