

REPLICATION INSTRUCTIONS FOR TABLES AND FIGURES IN “HOW SMART AND TOUGH ARE DEMOCRACIES? REASSESSING THEORIES OF DEMOCRATIC VICTORY IN WAR”

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*Table 1. Probit and Ordered Probit Models of War Outcomes*¹

- Model 1: Probit
 - Dependent Variable: w1
 - Independent Variables: polini poltarg init concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4
 - Calculate robust standard errors: robust
 - Stata Code: probit w1 polini poltarg init concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust

- Model 2: Probit
 - Dependent Variable: wldesch
 - Independent Variables: polinitdesch poltargdesch initdesch concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4
 - Calculate robust standard errors cluster on each war: robust cluster (war)
 - Stata Code: probit wldesch polinitdesch poltargdesch initdesch concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)

- Model 3: Ordered Probit (oprobit)
 - Dependent Variable: wldownes
 - Independent Variables: pol21 initially targally pol21initially pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4
 - Calculate robust standard errors cluster on each war: robust cluster (war)
 - Stata Code: oprobit wldownes pol21 initially targally pol21initially pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)

¹ All instructions are general, but code is for *Stata* and *CLARIFY: Software for Interpreting and Presenting Statistical Results* by Michael Tomz, Jason Wittenberg, and Gary King.

Figure 1. Marginal Effect of Change in Democracy on the Likelihood of Victory for War Initiators

- Repeat steps for Model 3, but insert the command “estsimp” before “oprobit”
- Set the values of the continuous independent variables at their means, the dichotomous ones at their modes, targally and pol21targally to zero, initially to 1, and pol21 and pol21initially to 2
 - setx pol21 2 initially 1 targally 0 pol21initially 2 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0
- Calculate the marginal effect of increasing pol21 and pol21initially from 1 to 2 on the likelihood of victory
 - simqi, fd(prval(2)) changex(pol21 1 2 pol21initially 1 2)
- Repeat these two steps, changing pol21 and pol21initially to 3, then 4, etc., all the way to 21, each time calculating the effect on the likelihood of victory of changing the two variables from 1 to 3, then 1 to 4, etc., 1 to 21.

Figure 2. Marginal Effect of Change in Democracy on the Likelihood of Victory for War Targets

- Repeat steps for Model 3, but insert the command “estsimp” before “oprobit”
- Set the values of the continuous independent variables at their means, the dichotomous ones at their modes, initially and pol21initially to zero, targally to 1, and pol21 and pol21targally to 2
 - setx pol21 2 initially 0 targally 1 pol21initially 0 pol21targally 2 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0
- Calculate the marginal effect of increasing pol21 and pol21targally from 1 to 2 on the likelihood of victory
 - simqi, fd(prval(2)) changex(pol21 1 2 pol21targally 1 2)
- Repeat these two steps, changing pol21 and pol21targally to 3, then 4, etc., all the way to 21, each time calculating the effect on the likelihood of victory of changing the two variables from 1 to 3, then 1 to 4, etc., 1 to 21.

Figure 3. Marginal Effect of Change in Democracy on the Likelihood of Victory for War Joiners

- Repeat steps for Model 3, but insert the command “estsimp” before “oprobit”
- Set the values of the continuous independent variables at their means, the dichotomous ones at their modes, initially, targally, pol21initially, and pol21targally to zero, and pol21 to 2
 - setx pol21 2 initially 0 targally 0 pol21initially 0 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0
- Calculate the marginal effect of increasing pol21 from 1 to 2 on the likelihood of victory
 - simqi, fd(prval(2)) changex(pol21 1 2)
- Repeat these two steps, changing pol21 to 3, then 4, etc., all the way to 21, each time calculating the effect on the likelihood of victory of changing the variable from 1 to 3, then 1 to 4, etc., 1 to 21.

Table 2. Summary of Marginal Effects of Changing Democracy from Minimum to Maximum on All War Outcomes for War Initiators, Targets, and Joiners (from table 1, model 3)

- Table 2 simply shows the marginal effects of shifting from the lowest to highest level of democracy on the likelihood of winning, drawing, and losing for war initiators, targets, and joiners.
- Code for war initiators:
 - `estsimp oprobit wlddownes pol21 initaly targally pol21initaly pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initaly 1 targally 0 pol21initaly 21 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21initaly 1 21)`
 - Change in p(draw): `simqi, fd(prval(1)) changex(pol21 1 21 pol21initaly 1 21)`
 - Change in p(lose): `simqi, fd(prval(0)) changex(pol21 1 21 pol21initaly 1 21)`
- Code for war targets:
 - `estsimp oprobit wlddownes pol21 initaly targally pol21initaly pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initaly 0 targally 1 pol21initaly 0 pol21targally 21 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21targally 1 21)`
 - Change in p(draw): `simqi, fd(prval(1)) changex(pol21 1 21 pol21targally 1 21)`
 - Change in p(lose): `simqi, fd(prval(0)) changex(pol21 1 21 pol21targally 1 21)`
- Code for war joiners:
 - `estsimp oprobit wlddownes pol21 initaly targally pol21initaly pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initaly 0 targally 0 pol21initaly 0 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21)`
 - Change in p(draw): `simqi, fd(prval(1)) changex(pol21 1 21)`
 - Change in p(lose): `simqi, fd(prval(0)) changex(pol21 1 21)`

Table 3. Marginal Effects of Changing Democracy from Minimum to Maximum on Probability of Victory for War Initiators, Targets, and Joiners (from model 3 reestimated with multinomial logit)

- Table 3 shows the marginal effects of shifting from the lowest to highest level of democracy on the likelihood of winning for war initiators, targets, and joiners using multinomial logit.
- Code for war initiators:
 - `estsimp mlogit wldownes pol21 initaly targally pol21initaly pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initaly 1 targally 0 pol21initaly 21 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21initaly 1 21)`
- Code for war targets:
 - `estsimp mlogit wldownes pol21 initaly targally pol21initaly pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initaly 0 targally 1 pol21initaly 0 pol21targally 21 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21targally 1 21)`
- Code for war joiners:
 - `estsimp oprobit wldownes pol21 initaly targally pol21initaly pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initaly 0 targally 0 pol21initaly 0 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21)`
- Regression output is shown below in Table 1A; the marginal effects are shown in Table 3 in the article.

Table 1A. Multinomial Logit Model of War Outcomes (DV is Win/Draw/Lose; Win is Base Outcome)

Lose	Coefficient	SE
Polity (1 to 21)	-0.12	0.09
Initiation	-1.23	1.03
Target	-0.21	1.19
Polity (1 to 21) × Initiation	0.05	0.09
Polity (1 to 21) × Target	0.08	0.09
Relative capabilities	-5.45***	1.24
Alliance contribution	-6.55***	1.66
Quality ratio	-0.11	0.08
Terrain	6.64*	3.59
Strategy × Terrain	-1.92*	1.15
Strategy 1	-1.51	4.21
Strategy 2	4.44	2.71
Strategy 3	-0.75	2.12
Strategy 4	-2.91	1.91
Constant	4.35*	2.38
<hr/>		
Draw	Coefficient	SE
Polity (1 to 21)	-0.01	0.05
Initiation	-1.64*	0.93
Target	-0.30	1.07
Polity (1 to 21) × Initiation	0.07	0.08
Polity (1 to 21) × Target	-0.001	0.075
Relative capabilities	-2.58***	0.69
Alliance contribution	-5.37***	1.45
Quality ratio	-0.05	0.03
Terrain	5.33	4.37
Strategy × Terrain	-2.77**	1.41
Strategy 1	-5.69	4.02
Strategy 2	0.05	3.17
Strategy 3	-2.95	1.82
Strategy 4	-4.23**	1.91
Constant	6.73***	2.59
<hr/>		
<i>N</i>	233	
Log Pseudo-LL	-156.07	
Wald Chi ²	127.69***	

Robust standard errors clustered on each war in parentheses; * = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$.

ROBUSTNESS CHECKS

Robustness Check 1. Alternative Coding of War Initiator/Target/Joiner.

- War initiators and war targets are redefined as states that join the original initiator or target, respectively, within one week of the war's onset. War joiners are states that join either side after at least a week has passed.
- Code for war initiators:
 - `estsimp oprobit wlddownes pol21 initweek targweek pol21initweek pol21targweek concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initweek 1 targweek 0 pol21initweek 21 pol21targweek 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - `Change in p(win): simqi, fd(prval(2)) changex(pol21 1 21 pol21initweek 1 21)`
- Code for war targets:
 - `estsimp oprobit wlddownes pol21 initweek targweek pol21initweek pol21targweek concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initweek 0 targweek 1 pol21initweek 0 pol21targweek 21 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - `Change in p(win): simqi, fd(prval(2)) changex(pol21 1 21 pol21targweek 1 21)`
- Code for war joiners:
 - `estsimp oprobit wlddownes pol21 initweek targweek pol21initweek pol21targweek concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initweek 0 targweek 0 pol21initweek 0 pol21targweek 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - `Change in p(win): simqi, fd(prval(2)) changex(pol21 1 21)`
- Regression output is shown in Table 2A below, and marginal effects are shown in Figures 1A, 2A, and 3A.

Table 2A. Ordinal Logit Model of War Outcomes with Alternative (Temporal) Coding of War Initiators, Targets, and Joiners (DV is Win/Draw/Lose)

	Model 1
Polity (1 to 21)	0.025 (0.033)
Initiation	-0.31 (0.53)
Target	-0.64 (0.52)
Polity (1 to 21) × Initiation	0.004 (0.037)
Polity (1 to 21) × Target	-0.012 (0.031)
Relative capabilities	2.41*** (0.49)
Alliance contribution	2.85*** (0.71)
Quality ratio	0.04* (0.02)
Terrain	-1.85* (1.11)
Strategy × Terrain	0.47 (0.36)
Strategy 1	-0.58 (1.29)
Strategy 2	-2.58*** (0.88)
Strategy 3	-0.31 (0.65)
Strategy 4	1.02 (0.75)
<i>N</i>	233
Log Pseudo-LL	-167.83
Wald Chi ²	102.74***

Robust standard errors clustered on each war in parentheses.

* = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$.

Figure 1A. Marginal Effect of Change in Democracy on Probability of Victory for Initiators (temporal coding, ordered probit, with 95 percent confidence interval; DV = Win/Draw/Lose)

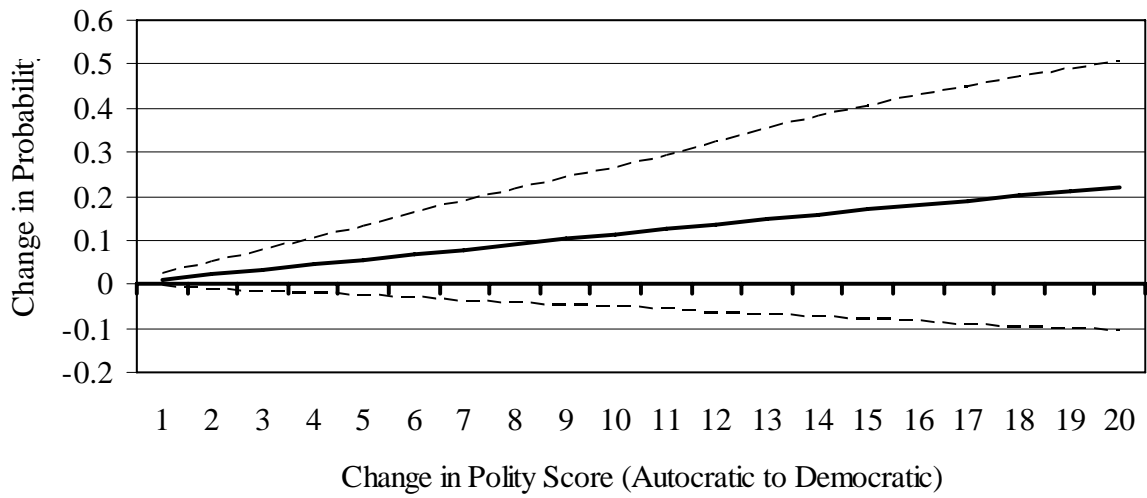


Figure 2A. Marginal Effect of Change in Democracy on Probability of Victory for Targets (temporal coding, ordered probit, with 95 percent confidence interval; DV = Win/Draw/Lose)

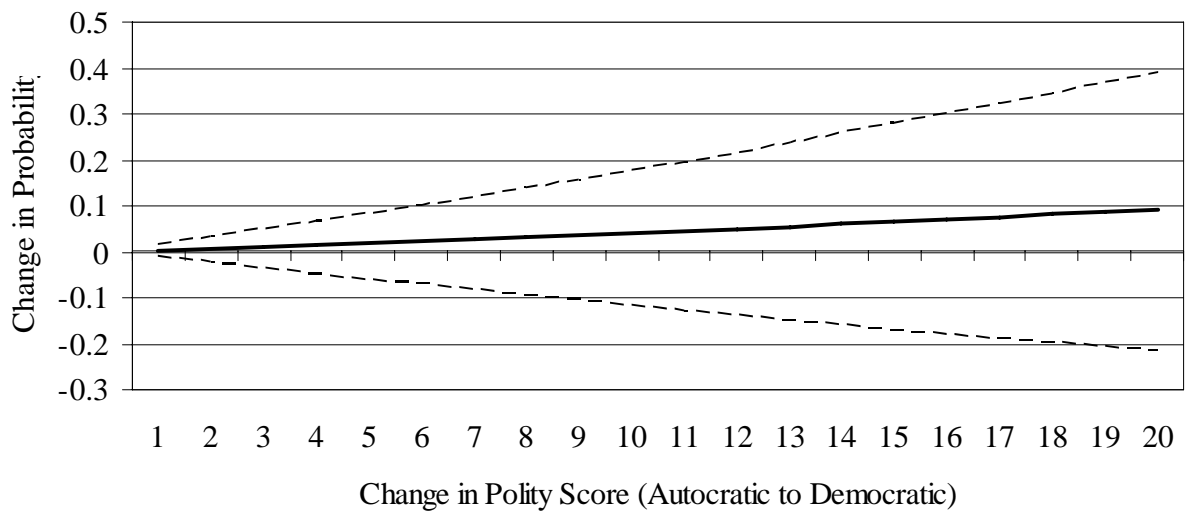
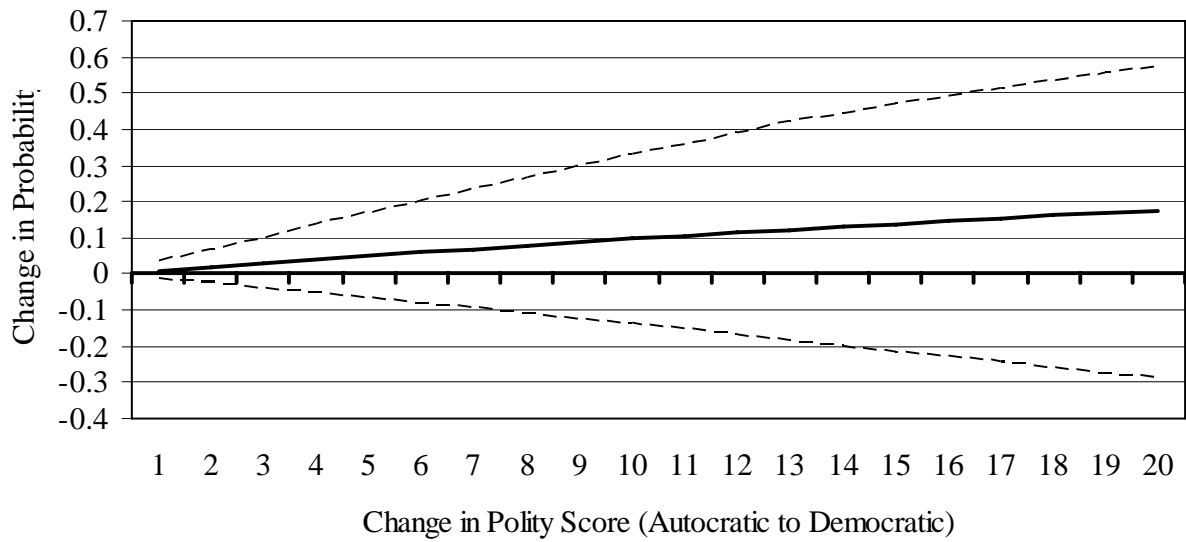


Figure 3A. Marginal Effect of Change in Democracy on Probability of Victory for Joiners (temporal coding, ordered probit, with 95 percent confidence interval; DV = Win/Draw/Lose)



Robustness Check 2. Multinomial Logit Instead of Ordered Probit.

- See instructions for Table 3.

Robustness Check 3. Combine War Initiators and Joiners.

- The choice to start a war in the first place, or enter a war that is already ongoing, may follow a similar logic. To test for this possibility, I created a variable coded 1 if a state was either a war initiator OR a joiner. I then interacted this variable with level of democracy.
- Code for war initiator/joiner:
 - `estsimp oprobit wlddownes pol21 initjointly pol21initjointly concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initjointly 1 pol21initjointly 21 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21initjointly 1 21)`
- Code for war targets:
 - `estsimp oprobit wlddownes pol21 initjointly pol21initjointly concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initjointly 0 pol21initjointly 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21)`
- Regression output is shown in Table 3A below; marginal effects are summarized in Table 4A.

Table 3A. Ordinal Logit Estimates of War Outcomes with Initiators and Joiners Combined (DV is Win/Draw/Lose)

	Model 1
Polity (1 to 21)	0.022 (0.023)
Initiator/Joiner	0.45 (0.40)
Polity (1 to 21) × Initiator/Joiner	0.001 (0.030)
Relative capabilities	2.39*** (0.48)
Alliance contribution	2.93*** (0.72)
Quality ratio	0.04* (0.02)
Terrain	-1.86* (1.11)
Strategy × Terrain	0.47 (0.36)
Strategy 1	-0.54 (1.29)
Strategy 2	-2.56*** (0.87)
Strategy 3	-0.27 (0.65)
Strategy 4	1.02 (0.75)
<i>N</i>	233
Log Pseudo-LL	-168.87
Wald Chi ²	94.57***

Robust standard errors clustered on each war in parentheses. * = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$.

Table 4A. Marginal Effects of Changing Democracy from Minimum to Maximum on Probability of Victory for Combined War Initiators/Joiners (from Table 3A)

Type of Belligerent	Change in Probability of Victory	Standard Error	95 Percent Confidence Interval	90 Percent Confidence Interval
Initiator/Joiner	0.187	0.147	-0.109, 0.457	-0.063, 0.426
Target	0.156	0.157	-0.152, 0.455	-0.099, 0.418

Robustness Check 4. Treating Draws as “Not Wins.”

- In the selection effects logic, democratic leaders who start wars that devolve into costly stalemates and/or who fail to achieve their aims are vulnerable to removal from office and thus should avoid such wars. Wars that end in draws are often costly stalemates where leaders do not achieve their aims. There is a case to be made, therefore, that draws should be treated as the functional equivalent of losses.
- To test whether this coding changes the results, I created a new war outcome variable coded 1 if a state won and zero if a state experienced a loss or a draw.
- Code for war initiators:
 - `estsimp probit winnowindownes pol21 initially targally pol21initially pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initially 1 targally 0 pol21initially 21 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21initially 1 21)`
- Code for war targets:
 - `estsimp probit winnowindownes pol21 initially targally pol21initially pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initially 0 targally 1 pol21initially 0 pol21targally 21 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21 pol21targally 1 21)`
- Code for war joiners:
 - `estsimp probit winnowindownes pol21 initially targally pol21initially pol21targally concap capasst qualrat terrain straterr strat1 strat2 strat3 strat4, robust cluster(war)`
 - `setx pol21 21 initially 0 targally 0 pol21initially 0 pol21targally 0 concap .368 capasst .169 qualrat 2.774 terrain .703 straterr 2.056 strat1 0 strat2 0 strat3 1 strat4 0`
 - Change in p(win): `simqi, fd(prval(2)) changex(pol21 1 21)`
- Regression output is shown in Table 5A below; marginal effects on the likelihood of victory for initiators, targets, and joiners are shown in Table 6A.

	Model 1
Polity (1 to 21)	0.035 (0.043)
Initiation	0.80 (0.55)
Target	0.07 (0.63)
Polity (1 to 21) × Initiation	-0.032 (0.048)
Polity (1 to 21) × Target	-0.017 (0.048)
Relative capabilities	2.55*** (0.51)
Alliance contribution	3.59*** (0.73)
Quality ratio	0.04* (0.02)
Terrain	-3.62** (1.66)
Strategy × Terrain	1.30** (0.52)
Strategy 1	1.85 (1.70)
Strategy 2	-1.32 (1.40)
Strategy 3	0.96 (0.81)
Strategy 4	1.99** (0.84)
<i>N</i>	233
Log Pseudo-LL	-98.10
Wald Chi ²	75.14***

Robust standard errors clustered on each war in parentheses.

0 = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$.

Type of Belligerent	Change in Probability of Victory	Standard Error	95 Percent Confidence Interval	90 Percent Confidence Interval
Initiator	0.008	0.203	-0.384, 0.394	-0.327, 0.344
Target	0.124	0.202	-0.276, 0.502	-0.209, 0.461
Joiner	0.247	0.286	-0.312, 0.764	-0.244, 0.703

LIST OF VARIABLES IN THE ANALYSIS

VARIABLE	DESCRIPTION	N	MEAN	STD	MIN	MAX
Reiter and Stam Variables						
war	war number	234	-	-	-	-
name	war name	234	-	-	-	-
ccode	country code	234	-	-	-	-
actor_na	state name	234	-	-	-	-
wl	win/lose	197	1.04	1.00	0	2
init	war initiator	197	0.44	0.50	0	1
target	war target	197	0.56	0.50	0	1
politics	polity, -10 to +10	197	-2.58	6.61	-10	10
polini	politics×init	197	-1.00	4.59	-10	10
poltarget	politics×target	197	-1.58	5.07	-10	10
concap	state's share of total material capabilities in the war	234	0.37	0.31	0.001	0.99
capasst	state's allies' share of total material capabilities in the war	234	0.17	0.25	0	0.90
qualrat	troop quality, spending per soldier	234	2.77	7.00	0.01	79.83
terrain	ease or difficulty of terrain	234	0.70	0.21	0.30	1.05
strat1	strategy 1	234	0.08	0.27	0	1
strat2	strategy 2	234	0.08	0.27	0	1
strat3	strategy 3	234	0.73	0.45	0	1
strat4	strategy 4	234	0.04	0.20	0	1
strat5	strategy 5	234	0.07	0.26	0	1
strat	strategy type	234	2.95	0.86	1	5
straterr	strat×terrain	234	2.06	0.88	0.50	5
rsoriginal	Reiter and Stam's original 197 cases	234	0.84	0.37	0	1
Desch Variables						
wldesch	win/lose	192	1.03	1.00	0	2
initdesch	war initiator	197	0.42	0.49	0	1
targdesch	war target	197	0.58	0.49	0	1
polinitdesch	politics×initdesch	197	-1.30	4.38	-10	10
poltargetdesch	politics×targdesch	197	-1.27	5.27	-10	10
Downes Variables						
wlddownes	win/draw/lose	233	1.03	0.92	0	2
winnowindownes	win/no win (losses and draws)	233	0.43	0.50	0	1
pol21	polity, 1 to 21	234	8.58	6.62	1	21
initially	war initiator	233	0.45	0.50	0	1
targally	war target	233	0.44	0.50	0	1
joinally	war joiner	233	0.11	0.31	0	1
pol21initially	pol21×initially	233	4.02	6.34	0	21
pol21targally	pol21×targally	233	3.63	5.91	0	21
initjoinally	war initiator or joiner	233	0.56	0.50	0	1
pol21initjoinally	pol21×initjoinally	233	4.90	6.66	0	21
initweek	war initiator, temporal coding	233	0.48	0.50	0	1
targweek	war target, temporal coding	233	0.44	0.50	0	1
joinweek	war joiner, temporal coding	233	0.08	0.27	0	1
pol21initweek	pol21×initweek	233	4.09	6.32	0	21
pol21targweek	pol21×targweek	233	3.72	6.01	0	21
initjoinweek	war initiator or joiner, temporal coding	233	0.56	0.50	0	1
pol21initjoinweek	pol21×initjoinweek	233	4.81	6.58	0	21