Regular Article

Journal of Peace Research

Modeling threats and promises: Explaining the Munich crisis of 1938

Journal of Peace Research
1–14

DOI: 10.1177/00223433221089729
journals.sagepub.com/home/jpr
SAGE

Frank C Zagare

Department of Political Science, University at Buffalo, SUNY

D Marc Kilgour

Department of Mathematics, Wilfrid Laurier University

Abstract

The use of an incomplete information game model to explore the strategic characteristics of the carrot and stick approach to coercive diplomacy shows that the dynamics of this manipulative bargaining tactic are much more nuanced than standard atheoretical accounts suggest. One unexpected finding is that when information is incomplete, there *always* exists a deterrence equilibrium under which no attempt is made to overturn the status quo. An all-out conflict or an unsuccessful fait accompli is also possible, but only when information about preferences is not common knowledge. Incomplete information, then, is a double-edged sword, sometimes enhancing the prospects for peace and at other times making conflict more likely. We use a special case of the Carrot and Stick Game model to shed theoretical light on the Munich crisis of 1938, a manufactured crisis if there ever was one. Hitler's last-minute about-face was motivated by his newfound belief that the British, French, and Czechs intended to resist his planned military invasion of the Sudetenland *and* his preference to avoid an all-out war. While his preference was unchanged in 1939, his beliefs were not; as our model suggests, the consequences were more than predictable.

Keywords

appeasement, coercive diplomacy, crisis bargaining, deterrence, game theory, incomplete information, Sudetenland

Most if not all bilateral interstate relationships are conducted in the shadow of power. In the security studies literature, an attempt to exercise this power is referred to as 'coercive diplomacy'. Alexander George (1991), who prefers the term 'forceful persuasion', identifies five distinct stratagems he claims are commonly used by states who hope to manipulate another's behavior. In this article we explore the strategic dynamic of one of them: the carrot and stick approach.[1]

As its name suggests, the carrot and stick approach combines both the power to punish (i.e. the stick) with the ability to reward (i.e. the carrot). The relationship of the United States and Israel during the Obama administration is a good example. The (sometimes) executed threat to withhold diplomatic support by the United States was frequently accompanied by a (delivered) promise of tangible military assistance to Israel. As will be seen, at the Munich conference in 1938, Germany's Chancellor, Adolf Hitler, also combined the threat of punishment (i.e. a war) with a promise to Britain's Prime Minister Neville Chamberlain not to forcefully dismantle Czechoslovakia. The promise, however, was not long kept. Less than six months later he absorbed what little remained of the Bohemian republic (Rock, 2000).

The conditions under which threats are more or less likely to be successful have been extensively analyzed game theoretically (e.g. Zagare & Kilgour, 2000), but their *interaction* with promises is less well understood

[1] The 'classic' ultimatum, the 'tacit' ultimatum, the 'try-and-see' approach, and the 'gradual turning of the screw' are the other coercive bargaining strategies George identifies.

Corresponding author:
Email: FCZagare@Buffalo.edu

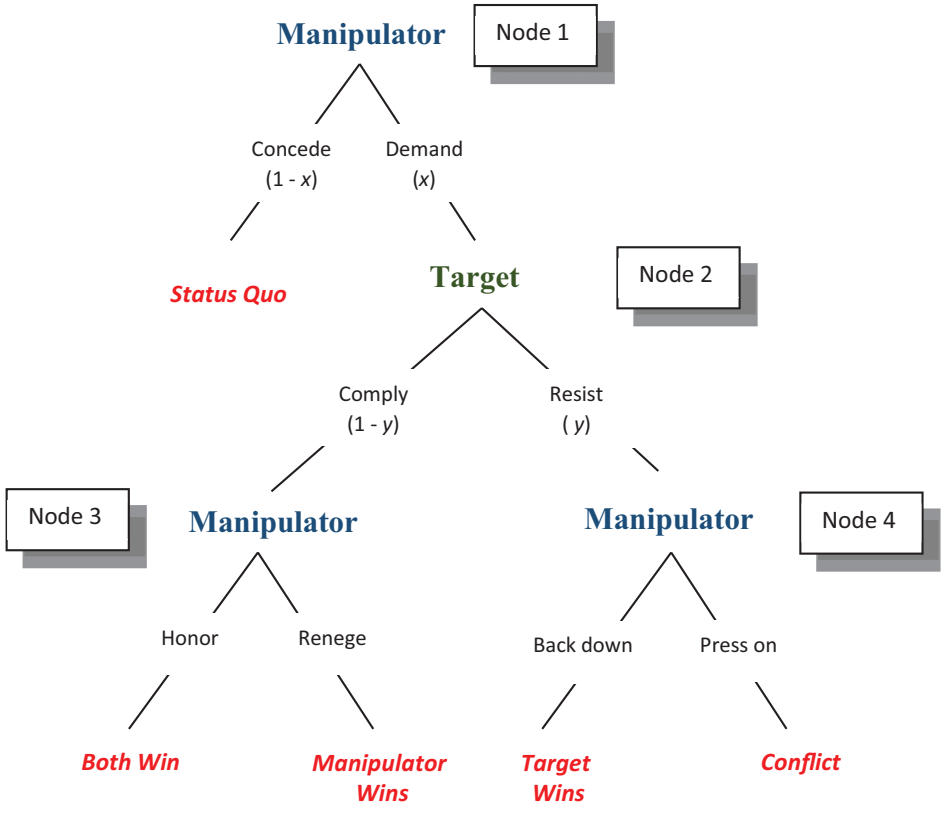


Figure 1. Carrot and Stick Game
Key: x = probability that Manipulator demands at node 1
y = probability that Target resists at node 2

(Davis, 2000).[2] Earlier, one of us developed a complete information game model, the *Carrot and Stick Game*, in order to better understand the dynamic interplay of these two critical components of diplomatic exchange (Zagare, 2020). In this essay we take the next step and examine a pertinent special case of the *Carrot and Stick Game with incomplete information* and use it to shed some theoretical light on the Munich crisis of 1938.

The Carrot and Stick Game

Figure 1 summarizes the critical components of the Carrot and Stick Game: the players, their choices, and the possible outcomes. There are two players, a *Manipulator* and its *Target*. Manipulator begins play (at decision node 1) by deciding whether to initiate a crisis. If it makes no demand, the game ends before it begins, a non-event occurs, and the outcome is *Status Quo*. But a demand for a change in the status quo presents Target with a difficult decision (at node 2): whether to Comply or Resist the demand.

It is not necessary to be specific about the nature of Manipulator's demand. It could be a call either to stop or reverse a course of action currently under way, as George suggests, or it could simply be a seemingly polite request to modify a long-established policy. Theoretically, there is no difference between the defensive demand that George focuses on and the more offensive demand he ascribes to compellent threats, at least within the confines of the Carrot and Stick model of crisis bargaining.

Target's decision at node 2 is difficult for two reasons. Not only are the consequences of either choice starkly different, but they are also uncertain. In other words, the outcome of the game depends not only on Target's choice, but on Manipulator's choice at nodes 3 or 4. To make resistance less likely, Manipulator promises to reward compliance (at node 3); and to make compliance

[2] One reason may be that in the coercive bargaining literature, threats and promises are generally treated as mutually exclusive. As Dorussen (2001: 251) notes, in this area 'the leading research question is the effectiveness and efficiency of incentives relative to (economic) sanctions'.

Table I. Initial preference assumptions for Carrot and Stick Game

Manipulator	*Target*
Manipulator Wins or *Both Win*	*Status Quo*
Status Quo	*Target Wins* or *Both Win*
Conflict or *Target Wins*	*Conflict* or *Manipulator Wins*

more likely, it threatens to punish non-compliance (at node 4). Manipulator, however, may or may not honor its promise or execute its threat.

If Target complies and Manipulator honors its promise at node 3, the outcome is *Both Win*.[3] But *Manipulator Wins* (and Target loses) if it does not. On the other hand, if Target resists the demand, *Conflict* occurs if Manipulator presses on and executes its threat. But if Manipulator backs down, *Target Wins* while Manipulator suffers a serious diplomatic defeat. Note that *Both Win* is the carrot, while *Conflict* is the stick.

Preferences

The game tree of Figure 1 succinctly captures the rules of the game. What remains to be specified are the players' preferences, and what the players know about each other's preferences. Different preference and information assumptions imply different games.

Not all of the preference combinations, or distinct games, that can be associated with the Carrot and Stick Game model are strategically or theoretically interesting. The preference assumptions arrayed in Table I, however, are both. They are theoretically interesting because they make salient a common context of crisis bargaining; and they are strategically interesting because different combinations of Manipulator's and Target's preferences have significant implications for the way the game plays out.

The columns of Table I provide what is common knowledge about the players' preferences over the five outcomes, ranked from best to worst. For example, Target most prefers the *Status Quo*, next-most prefers either *Target Wins* or *Both Win*, and so on. Since either of these two outcomes may be preferred to the other, they are listed in the same cell of Table I. In other words, no fixed assumption is made about Target's relative preference between *Target Wins* and *Both Win*, and similarly for any outcomes contained in the same cell of Table I for either player. The players' relative preferences for these paired outcomes are the crucial explanatory variables of the model. Next, we justify these preference assumptions, beginning with Manipulator's.

Manipulator's preferences. The Carrot and Stick Game is both theoretically and strategically trivial unless Manipulator's goal is to change Target's behavior or to alter its policy orientation. By definition, then, it prefers *Manipulator Wins* and *Both Win* to the *Status Quo.*

Less clear, however is Manipulator's preference between *Manipulator Wins* and *Both Win.* If Manipulator reneges on its promise at node 3, it may develop a reputation for being unreliable and thereby incur a cost (Sartori, 2002, 2005). If the reputational cost is seen as low, it prefers *Manipulator Wins* to *Both Win*. If it is high, it prefers *Both Win* to *Manipulator Wins.* Thus there are two logical possibilities for the top three outcomes in Manipulator's preference ranking:

$$\textit{Manipulator Wins} \succ \textit{Both Win} \succ \textit{Status Quo}$$

$$\textit{Both Win} \succ \textit{Manipulator Wins} \succ \textit{Status Quo}$$

A Manipulator that prefers *Manipulator Wins* to *Both Win* is called *Perfidious*. A Manipulator that prefers *Both Win* to *Manipulator Wins* is called *Honorable*.

In what follows, *Target Wins* and *Conflict* are assumed to be Manipulator's two least-preferred outcomes.[4] The fact that it prefers the *Status Quo* to either of these two outcomes means that Target's implied threat to resist at node 2 is capable (Zagare, 1987); that is, if executed, the threat will hurt (Schelling, 1966: 7). Were this not the case, Manipulator would always make a demand at node 1 and Target's ability to deter a challenge would be nonexistent. Clearly the Carrot and Stick Game provides a much richer theoretical environment when the deck is not stacked against one of the players.

Manipulator's node 4 decision, which occurs only if Target resists its demand, is not necessarily straightforward. One option is to press on and precipitate a *Conflict*. Obviously, participation in a *Conflict* is not generally costless. On the other hand, there is also a reputational cost attached to backing down and inducing the outcome *Target Wins*. Depending on these relative

[3] This does not mean that Target necessarily prefers this outcome to the *Status Quo*. But as Schelling (1966: 4) notes 'Coercion by threat of damage [. . .] requires that our interests and our opponent's not be absolutely opposed [. . .] Coercion requires finding a bargain, arranging for [the opponent] to be better off doing what we want – worse off not doing what we want'. It is in this sense that *Both Win* when a promise is kept.

[4] This, of course, does not mean that either is precluded under rational play. As we note later in this article, one of our goals is to specify the conditions under which they occur in equilibrium.

Table II. Manipulator's preference and type designations

Manipulator's preferences	*Type*
Manipulator Wins ≻ *Both Win* ≻ *Status Quo* ≻ *Conflict* ≻ *Target Wins*	*Perfidious/Determined*
Both Win ≻ *Manipulator Wins* ≻ *Status Quo* ≻ *Target Wins* ≻ *Conflict*	*Honorable/Reluctant*

costs and the utility it attaches to either outcome, Manipulator may prefer *Conflict* to *Target Wins* or the other way around. A Manipulator that prefers *Conflict* to *Target Wins* is called *Determined.* A Manipulator that prefers *Target Wins* to *Conflict* is called *Reluctant.*

Under complete information, the *Status Quo* is the only rational strategic possibility when Manipulator is both Perfidious and Reluctant (Zagare, 2020). There is, in other words, no possibility that a Manipulator with neither a credible threat nor a credible promise will demand a change in the status quo. Although it is difficult to say how often such cases arise in the real world it may well be the modal category. Nonetheless, because it is strategically transparent, we ignore the possibility that Manipulator is of this type.

For many of the same reasons, we also assume that there is zero probability that Manipulator is both honorable *and* determined, that is, that both its promise and its threat is perfectly credible. It is certainly no surprise that, under complete information, coercive diplomacy is *always* employed, the status quo *never* survives rational play, and that a mutually agreed bargain is *always* achieved. There is, therefore, little to be gained by examining this most uninteresting case.

To put all this in a slightly different way, we analyze the Carrot and Stick Game with incomplete information when there is uncertainty about the credibility of Manipulator's threat *and* of its promise, leaving open the possibility that Manipulator is either perfidious or honorable as well as the possibility that it is either determined or reluctant (see Table II). These possibilities, and the associated uncertainty, are not only the most interesting theoretically, but are also likely characteristic of most salient real-world diplomatic disputes.

For example, during the run-up to the Munich crisis, there was considerable debate among British policy makers about the credibility of Hitler's threat and of his promise. British Prime Minister Neville Chamberlain and his inner cabinet believed Hitler to be trustworthy (i.e. honorable) yet determined. But there was considerable dissent. The most prominent dissenters inside the government were the Foreign Secretary Anthony Eden (until he resigned in protest), and Duff Cooper, the First Lord of the Admiralty. Outside the government, of course, stood Winston Churchill, who not only claimed that Hitler was not to be trusted (i.e. was perfidious), but also argued that he would back down if put to the test (i.e. was reluctant). But since Chamberlain's was the prevailing opinion, our subsequent analysis of this crisis will take as a given his continuing belief that Hitler was most unlikely to be perfidious.

Target's preferences. Target's three most preferred outcomes are *Status Quo*, *Target Wins*, and *Both Win*. Whether it prefers *Status Quo* to *Target Wins* or *Both Win* is strategically unimportant. Target never has a choice between *Status Quo* and any other outcome. So, to simplify the analysis, the assumption will be that for Target, *Status Quo* is preferred to both *Target Wins* and *Both Win.*

Less clear, however, is Target's preference between *Both Win* and *Target Wins*. Some state actors may prefer to humiliate an adversary and force it to back down in a standoff. For example, in 1908, Germany's goal when it precipitated the first Moroccan crisis by demanding an international conference was to expose Great Britain's unreliability as an ally and, thereby, break the Entente Cordiale (Massie, 1991: 363). Other Targets, however, may have the opposite preference, preferring not to embarrass a rival because doing so might make matters worse. For example, neither Britain nor France was interested in pursuing what Snyder (1997: 337–338) calls a 'divide and rule' policy in the years leading up to World War I. Both Sir Edward Grey, Britain's Foreign Secretary, and President Raymond Poincaré of France believed that separating Austria-Hungary from Germany would only provoke Germany, making it more belligerent in the future. Thus, for Target, either:

Target Wins ≻ *Both Win, or*

Both Win ≻ *Target Wins*

are logical possibilities. A Target that prefers *Target Wins* to *Both Win* is called *Disruptive.* A Target that prefers *Both Win* to *Target Wins* is called *Circumspect.*

Conflict and *Manipulator Wins* are clearly Target's two-least preferred outcomes. But, again, its actual preference between these two outcomes may depend on circumstances. If the cost of *Conflict* is low, Target may prefer to risk the uncertainty of a confrontation and resist

Manipulator's demand. But when the cost of *Conflict* is high, so that *Manipulator Wins* ≻ *Conflict*, Target may prefer to avoid the risk.

Whether it does, however, will depend not only on its preference between these two outcomes but also on its estimates of the credibility of both Manipulator's threat and promise, as will be discussed later. Thus, either:

Conflict ≻ *Manipulator Wins, or*
Manipulator Wins ≻ *Conflict*

are logically defensible as rational strategic preference possibilities. A Target that prefers *Conflict* to *Manipulator Wins* is called *Steadfast.* A Target that prefers *Manipulator Wins* to *Conflict* is called *Irresolute*.

In our analysis of the Carrot and Stick Game with incomplete information, we consider only two types of Target: Disruptive/Irresolute types and Circumspect/Steadfast types. Our reasoning is straightforward: a demand for an alteration of the status quo is a low probability event when Target is likely to be both steadfast and disruptive, while the status quo will not often survive when Manipulator believes that Target is both circumspect and irresolute. In other words, we restrict our analysis to the two types of Target that are most problematic for a dissatisfied Manipulator.

Again, the run-up to the Munich crisis is a case in point. All along, Hitler believed, despite numerous warnings, that the British and French would back down regardless of his demands. But as Faber (2008: 163) points out, 'at the back of his mind there still lurked sufficient uncertainty for him to feel the need for additional insurance'.[5] Evidence of this uncertainty was his visit to Rome in early May to secure the support of the Italian leader, Benito Mussolini. And, as will be seen, his sudden reversal at the Munich conference itself is an indication that he was not fully convinced of his opponent's type. Nonetheless, since Hitler thought it more likely than not that the British and French would capitulate, our analysis of the crisis assumes that the probability that the two democracies were circumspect and steadfast was much smaller than the probability that they were disruptive and irresolute.

When information is complete, neither *Conflict* nor *Target Wins* can possibly occur in equilibrium, a direct consequence of Manipulator's presumed preferences for the *Status Quo* over either of these outcomes. Clearly, it would not rationally make a demand if it anticipates that, in doing so, Target will resist and force it to either back off or fight. Instead, like Kaiser Wilhelm early in the 20th century, it will choose to bide its time.

We know, however, that in the real world, conflicts occur – although not as often as generally thought. It is also the case that an attempted *fait accompli* sometimes fails, and a player is forced to retreat. Clearly, under the most theoretically interesting conditions, these outcomes can occur only when information about preferences is not common knowledge. Thus, to gain further insight into the role played by the interplay of threats and promises in crisis bargaining situations, we turn to the special case analysis of the Carrot and Stick Game with only two types of Manipulator and the two types of Target whose preferences as summarized in Table III.[6] Our goal is to specify, precisely, the conditions under which a carrot and stick approach to coercive diplomacy is not only most likely to occur, but also the circumstances under which such an approach is most likely to succeed (or fail). But to provide empirical context we next briefly outline the run-up to the Munich crisis, the broad parameters of which conform to those of the special case analysis.

The Munich (or Sudeten) crisis of 1938

Snyder & Diesing (1977: 550) point out that 'the precipitant-challenge-confrontation scheme is inappropriate and misleading' if one seeks to understand the Munich (or Sudeten) crisis of 1938, at least until its resolution in late September. The crisis arose as the three relevant powers pursued independent foreign policies: British policy sought the carrot, that is *accommodation* with Germany that would preserve the existing European order. It was important to Chamberlain that any accommodation with Hitler be made through negotiations rather than at the point of a gun. The particulars of his attempt to appease the German Chancellor were less important (Bouverie, 2019: 148, 251). France's policy goal, in contrast, was to avoid the stick, that is, a land war with Germany for which it believed it was ill prepared. In the denouement of the crisis, British

[5] The ambiguous nature of the warnings may also have contributed to his uncertainty about British intentions. For example, during the May crisis, the Germans were told that 'if France were to become involved in war, then "His majesty's Government could not guarantee that they would not be forced by circumstances to become involved also"' (Bouverie, 2019: 207). According to Britain's Foreign Secretary, the Earl of Halifax, this and other less than straightforward warnings were designed to keep Hitler guessing (Faber, 2008: 232).

[6] Our conjecture is that equilibrium behavior will be interesting only when our simplifying assumptions are satisfied.

Table III. Target's preference and type designations

Target's preferences	*Type*
Status Quo ≻ Target Wins ≻ Both Win ≻ Manipulator Wins ≻ Conflict	*Disruptive/Irresolute*
Status Quo ≻ Both Win ≻ Target Wins ≻ Conflict ≻ Manipulator Wins	*Circumspect/Steadfast*

and French interests converged (Snyder & Diesing, 1977: 551). Obtaining the carrot implied avoiding the stick. In 1938 German policy was directed at overturning the status quo in Europe by absorbing most of Czechoslovakia and partitioning what remained of the rest (Faber, 2008: 10–19). Moreover, Hitler preferred to achieve these ends by force.

German policy objectives were well known, but came into clearer focus after the so-called May crisis when rumors of German military activity near the Czechoslovakian border led the French to warn that they were committed to Czechoslovakia's defense. Although the rumors were unfounded, they were plausible given Germany's annexation of Austria only two months before. During the crisis, the British warned that they *might* support France should war break out (see fn. 5). Facing what Snyder & Diesing (1977: 438) call the 'deterrence vs. restraint dilemma', they told the French exactly the opposite.[7] Hitler, however, believed the British and French were bluffing (Kagan, 1995: 393). In any case, after these events, British and French efforts to mollify Hitler intensified.

The crisis itself was precipitated by an incendiary speech given by Hitler at a rally in Nuremberg on 12 September. In the terms of the model, Hitler's less than subtle demand for an alteration of the status quo clearly caught the attention of policy makers in London and Paris. The French immediately recognized that they would shortly 'have to decide whether or not to come to the aid of the Czechs if Hitler mobilized his troops in support of the Sudeten Germans' (Faber, 2008: 275). The French decision, however, depended on British support, or the lack thereof. In consequence, France's Prime Minister, Edouard Daladier, delegated France's node 2 choice to Chamberlain who, three days later, flew to Hitler's retreat in Berchtesgaden hoping to fend off what appeared to be an imminent German attack (Bouverie, 2019: xiii).

Hitler initially believed that Chamberlain had traveled to his Bavarian retreat to deliver a warning that the British and French were prepared to resist any attempts to dismember Czechoslovakia. But he soon learned otherwise. Chamberlain quickly agreed to Hitler's demand to annex all regions of Czechoslovakia where Germans constituted a simple majority, that is, the Sudetenland. Hitler managed to hold out the carrot, claiming that the Sudetenland would be his last territorial demand, but at the same time he brandished the stick, making clear that one way or another he intended to settle the Sudetenland problem.

Chamberlain 'was convinced that Hitler's goals were strictly limited, [. . .] that Hitler "meant what he said" and was telling the truth' (Kagan, 1995: 397), that is, that he was 'honorable'. By contrast, Hitler continued to believe that the British and French would stand aside should he invade the Bohemian republic, that is, that they were irresolute.[8]

After Chamberlain promised to guarantee the integrity of what would remain of the Czech state, the French agreed to jointly pressure Czechoslovakian President Eduard Beneš to agree to a plebiscite that would inevitably lead to Germany's absorption of the Sudetenland. After putting it to the Czechs in the starkest of terms, Chamberlain returned to Germany on 22 September at Bad Godesberg to conclude the agreement he had previously reached, only to discover that Hitler had increased his demands to include not only the *immediate* occupation of the Sudetenland, but also plebiscites in areas dominated by ethnic Poles and Hungarians. It was bad enough that satisfying Hitler now implied the dissolution of Czechoslovakia. What was worse for Chamberlain was being asked to accede to a military rather than a political settlement. The carrot that had been dangled had been pulled back.

Hitler's perfidy, however, backfired. In response to the Bad Godesberg demands, public opinion in Britain shifted and Cabinet support of Chamberlain's policy objectives eroded. Consequently, the British finally mobilized their navy and warned the Germans that they would stand with France should a war break out. The Czechs and French mobilized as well (Shirer, 1960: 540–543).

[7] For a game-theoretic analysis, see Zagare & Kilgour (2003).

[8] Winston Churchill held the same opinion (Bouverie, 2019: 239–240).

At the same time, opposition to an invasion of Czechoslovakia grew within the German military command, and Italian support seemed less certain. For whatever reason, Hitler backed down (Smith, n.d.: 114–124; Faber, 2008: 380–381). He agreed, eventually, to a four-power conference (that included the Italians but not the Czechs) at Munich where a *negotiated* agreement was reached which, at least in Chamberlain's mind, was consistent with British policy objectives. In the terms of the model, Chamberlain and his supporters viewed the outcome as *Both Win*. Hitler saw it differently, but the British thought that they had acquired the carrot and the French hoped and believed that they had avoided the stick. Events, of course, would prove otherwise.

The Carrot and Stick Game with incomplete information

Perfect Bayesian equilibrium is the accepted standard of rational play in a dynamic (or extensive-form) game with incomplete information. Since a perfect Bayesian equilibrium specifies an action choice for every type of every player at every decision node or information set belonging to the player, it must specify the action choice for both types of Manipulators at node 1 and for both types of Target at node 2.

A perfect Bayesian equilibrium must also indicate how each player updates its beliefs rationally (i.e. according to Bayes's Rule) about the other players' type in the light of new information obtained as the game is played out. In this instance, should Manipulator demand a change in the *Status Quo* at node 1, Target will have an opportunity to re-evaluate its initial beliefs about Manipulator's type before it makes a choice at node 2. The assumption is that Target will rationally reassess its beliefs about Manipulator's type and, therefore, Manipulator's likely response at nodes 3 and 4, based on that observation.

The information that Target obtains as a result of its observation of Manipulator's node 1 choice will be useful. But information that Manipulator obtains by observing Target's choice at node 2 is beside the point. Because it will end the game, Manipulator's choice at either node 3 or 4 is strictly determined by its type (preferences). At node 3, a perfidious Manipulator always reneges on its promise while an honorable Manipulator never does. Similarly, at node 4, reluctant Manipulators always back down while determined Manipulators always press on.

Initially, it is common knowledge that Manipulator is of type PD – that is, perfidious and determined – with probability p_{PD}, and of type HR (honorable and reluctant) with probability $p_{HR} = 1 - p_{PD}$. As well, it is common knowledge that Target is of type DI (disruptive and irresolute) with probability p_{DI}, and of type CS (circumspect and steadfast) with probability $p_{CS} = 1 - p_{DI}$. These initial type probabilities, as well as the utilities specified in the Online appendix, are (fixed) parameters of the game. A perfect Bayesian equilibrium of this special case of the Carrot and Stick Game then consists of a 5-tuple of probabilities $(x; y; q) = (x_{PD}; x_{HR}; y_{DI}; y_{CS}; q_{PD})$ where:

x_{PD} = the probability that a *p*erfidious/*d*etermined Manipulator demands at node 1

x_{HR} = the probability that an *h*onorable/*r*eluctant Manipulator demands at node 1

y_{DI} = the probability that a *d*isruptive/*i*rresolute Target resists at node 2

y_{CS} = the probability that a *c*ircumspect/*s*teadfast Target resists at node 2

q_{PD} = Target's updated probability that Manipulator is *p*erfidious/*d*etermined, given that Manipulator issues a demand at node 1

The first four probabilities are strategic variables describing Manipulator's and Target's choices, contingent on their type. The last probability is the *a posteriori* probability, updated by Target once Manipulator's choice to demand a change in the status quo at node 1 has been observed, that Manipulator is perfidious and determined – that is, that it plans to renege on its promise should Target comply with Manipulator's demand, and press on should Target resist the demand.

The precise conditions under which the various types of perfect Bayesian equilibria in the Carrot and Stick Game exist depends on four decision thresholds, one for each of the two types of each player, and the relationship of these thresholds to one another: Target's *Resist Threshold* and Manipulator's *Demand Threshold*.

Target's resist thresholds. As noted previously, Target's decision at Node 2 is difficult. In equilibrium, its choice depends on both its type and its updated belief about Manipulator's type. If Manipulator is perfidious and determined, Disruptive/Irresolute Targets prefer to comply while Circumspect/Steadfast Targets prefer to resist. But if Manipulator is honorable and reluctant, Target's preferences run the other way: Disruptive/Irresolute Targets prefer to resist while Circumspect/Steadfast Targets prefer to comply (see Table IV).

These conflicting behavioral tendencies give rise to two distinct thresholds, one for each type of Target.

Table IV. Target's conflicting behavioral tendencies

	Manipulator		
	Types	*Perfidious/Determined*	*Honorable/Reluctant*
Target	Disruptive/Irresolute	Comply	Resist
	Circumspect/Steadfast	Resist	Comply

We denote the resist threshold for a Disruptive/Irresolute Target by n_{DI}, while the resist threshold for a Circumspect/Steadfast Target is denoted n_{CS}. Since Disruptive/Irresolute Targets prefer to comply if Manipulator is perfidious and determined, it should be no surprise that Target will rationally resist if and only if the updated belief that Manipulator is perfidious and determined falls below its threshold (i.e. $q_{PD} < n_{DI}$). Similarly, since Circumspect/Steadfast Targets prefer to resist if Manipulator is perfidious and determined, it will resist if and only if its updated belief that that Manipulator is perfidious and determined exceeds its threshold (i.e. $q_{PD} > n_{CS}$).

The relative magnitude of Target's two decision thresholds is not without strategic import. For example, when the cost of conflict is seen to be relatively high, the resist threshold of a Disruptive/Irresolute Target (n_{DI}) may be lower than that of a Circumspect/Steadfast Target (n_{CS}), that is, $n_{DI} < n_{CS}$. If and when this occurs, a Disruptive/Irresolute Target will be more prone to comply, and therefore less likely to resist, Manipulator's demand than a Circumspect/Steadfast Target. Hitler clearly saw it this way during the run up to the conference in 1938. He began with a strong belief that the British and French would accept his demand for a disruption of the status quo. Nonetheless, for two reasons, we assume the opposite. First, not only was he wrong, but also he realized as much by 28 September, the day he agreed to the conference at Munich. And second, our assumption that $n_{CS} < n_{DI}$ reflects the view the carrot was much more important to the British than avoiding the stick (Smith, n.d.: 47).

Manipulator's demand thresholds. Like Target, each type of Manipulator has a threshold that governs its equilibrium behavior. The demand threshold for a perfidious and determined Manipulator is denoted u_{PD} while the threshold for an honorable and reluctant Manipulator is denoted u_{HR}. Since both types of Manipulator prefer that Target concedes, it is evident that a Manipulator's equilibrium behavior is determined by the unconditional probability (denoted r) that Target will resist. Perfidious/Determined Manipulators issue a demand if and only if $r \leq u_{PD}$ (i.e. that probability is low enough). Similarly, Honorable/Reluctant Manipulators demand a change of the status quo if and only if $r \leq u_{HR}$.

Like Target's, the relative magnitude of Manipulator's two thresholds is strategically salient. Specifically, when $u_{PD} > u_{HR}$, Honorable/Reluctant Manipulators will be more likely to *concede* at node 1 than Perfidious/Determined Manipulators, while Honorable/Reluctant Manipulators will be more likely to issue a *demand* than Perfidious/Determined Manipulators whenever $u_{PD} < u_{HR}$. Since Chamberlain had confidence that Hitler's claim that the Sudetenland was his last territorial claim in Europe, our analysis of the Carrot and Stick Game assumes a very low value of u_{PD}, that is we assume that despite his demand Hitler was seen to be almost certainly honorable. Specifically, we assume $u_{PD} < u_{HR} < 1 - u_{PD}$.

Perfect Bayesian equilibria. As shown in the Online appendix, there are ten distinct perfect Bayesian equilibria in this special case of the Carrot and Stick Game with incomplete information. These equilibria should be viewed as an exhaustive list of rational strategic possibilities. Prior to the play of a game, the equilibria serve as the foundation for contingent predictions. After the fact, they constitute the basis of a rational choice explanation. In the latter case, however, it is simply not sufficient to point to action choices that are consistent with those of a real-world actor. Also necessary for a plausible explanation is a mapping between the action choices and the conditions necessary to bring them about (Zagare, 2019). In a game of incomplete information, the specific beliefs that give rise to the equilibria constitute the set of necessary conditions.

Five of the perfect Bayesian equilibria are Deterrence equilibria,[9] one of which *always* exists. Under a Deterrence equilibrium, neither type of Manipulator ever issues a demand. The ubiquity of deterrence equilibria is counter-intuitive. Nonetheless, our analysis strongly

[9] The Deterrence equilibria are also Sequential equilibria (Kreps & Wilson, 1982).

Table V. Non-deterrence perfect Bayesian equilibria of the Carrot and Stick Game with incomplete information when $n_{CS} < n_{DI}$ and $u_{PD} < u_{HR} < 1 - u_{PD}$

	Manipulator		*Target*			
#	x_{PD}	x_{HR}	y_{DI}	y_{CS}	q_{PD}	*Existence conditions*
E1a	1	1	1	0	p_{PD}	$0 \leq p_{PD} \leq n_{CS}$ and $0 \leq p_{DI} \leq u_{PD}$
E1b	1	1	0	1	p_{PD}	$n_{DI} \leq p_{PD} \leq 1$ and $1 - u_{PD} \leq p_{DI} \leq 1$
E2	0	1	1	0	0	$u_{PD} \leq p_{DI} \leq u_{HR}$
E3a	x^a_{PD}	1	1	y^a_{CS}	n_{CS}	$n_{CS} < p_{PD} < 1$ and $0 \leq p_{DI} < u_{PD}$
E3b	X^b_{PD}	1	y^b_{DI}	1	n_{DI}	$n_{DI} < p_{PD} < 1$ and $1 - u_{PD} < p_{DI} \leq 1$

suggests that certain types of interstate conflicts are highly dependent on the beliefs of political elites. In our model there is always some belief that motivates a potential manipulator to do nothing. As will be discussed later, there are also certain conditions under which the only equilibrium is a deterrence equilibrium.

The remaining five perfect Bayesian equilibria can conveniently be grouped into three families according to Manipulator's (type-dependent) strategy (see Table V): the Carrot and Stick equilibria, a Separating equilibrium, and the Mixed Strategy Carrot and Stick equilibria. Under each equilibrium, an Honorable/Reluctant Manipulator *always* issues a demand. The various equilibria, then, are distinguished by the behavior of a Perfidious/Determined Manipulator and the two types of Targets.

1. *The Carrot and Stick Equilibria (E1a and E1b)*. We call the first family of perfect Bayesian equilibria the Carrot and Stick Equilibria. Under each member of this family, both types of Manipulators issue a demand at node 1 with certainty. In consequence, Target never gains additional insight into Manipulator's type once a demand is made. In equilibrium, therefore, its choice depends on its initial estimate that it is facing a perfidious and determined Manipulator (p_{PD}). Conversely, Manipulator's equilibrium choice depends on its belief about the type of Target it is facing.

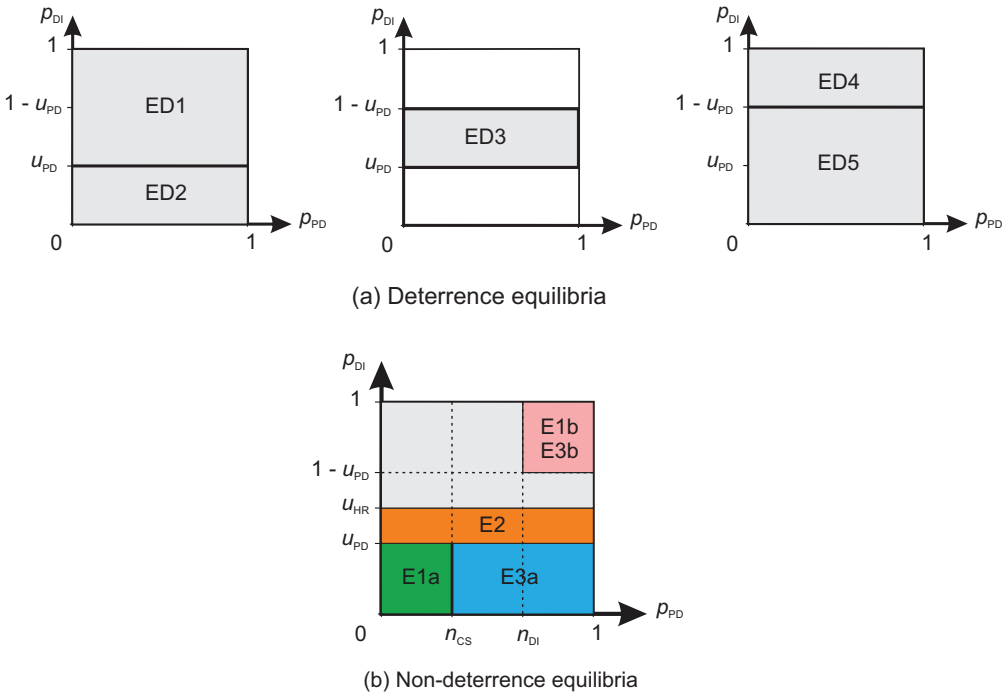
In contrast to Manipulator's action choices, Target's differ under each of the Carrot and Stick equilibria. Under the E1a perfect Bayesian equilibrium, only Disruptive/Irresolute Targets resist, while under E1b only Circumspect/Steadfast Targets resist. As discussed later, these two equilibria exist under unique parameter conditions, that is, they do not co-exist.

Conflict is possible under either member of this equilibrium family, but is more likely under E1b than under E1a. As one might well expect, Manipulator's propensity to issue a demand increases as the likelihood that Target will resist decreases, while the likelihood that Target accedes to the demand increases as the probability it is facing a Perfidious/Determined Manipulator increases.

2. *The Mixed Strategy Carrot and Stick Equilibria (E3a and E3b)*. When either Mixed Strategy Carrot and Stick equilibrium is in play, Honorable/Reluctant Manipulators always make a demand while Perfidious/Determined Manipulators sometimes do. Under E3a, which can be thought of as a mixed strategy variant of E1a, Disruptive/Irresolute Targets always resist while Circumspect/Steadfast Targets sometimes resist. The action choices of the two types of Targets are reversed under E3b which loosely tracks the behavioral characteristics of E1b. E3b and E1b always co-exist in our special case analysis. Since the Mixed Strategy Carrot and Stick Equilibria so closely resemble their pure strategy counterparts, we can safely group them together without losing theoretical traction.

3. *The Separating Equilibrium (E2)*. In contrast to both the pure and mixed strategy Carrot and Stick equilibrium families, only Manipulators who are both honorable and reluctant make a demand under the Separating equilibrium (E2). Similarly, only Disruptive/Steadfast Targets fail to comply. In consequence, *Conflict* is not a remote possibility. Of course, if Manipulator is perfidious and determined, the *Status Quo* will hold. But if it does not, the most likely outcome is *Both Win*.

Figure 2 (a and b) summarizes the existence conditions for each of the perfect Bayesian equilibria of the special case: (a) All Deterrence Equilibria – in three parts, because there is overlap, and (b) All Non-Deterrence Equilibria. Along the horizontal and vertical axes of these figures, respectively, are graphed the belief variables, p_{PD} (the probability that Manipulator is Perfidious/Determined) and p_{DI} (the probability that Target is Disruptive/Irresolute). In Figure 2b the demand thresholds of both types of Manipulator and the resist thresholds of both types of Target are also indicated.



Figures 2a and 2b. Existence regions for equilibria of the Carrot and Stick Game, assuming $n_{CS} < n_{DI}$ and $u_{PD} < u_{HR} < 1 - u_{PD}$

As Figure 2b shows, and as one might very well expect, E1b – and its mixed strategy analogue E3b – are rational strategic possibilities if and only if Manipulator believes it highly likely that Target is irresolute, while Target believes that Manipulator is most likely determined. This set of initial beliefs *may* lead a Perfidious/Determined Manipulator to always (under E1b) or sometimes (under E3b) demand a change in the status quo, and an irresolute Target, the most likely type, to comply with its demands.[10] Of course, in the unlikely event that Target is steadfast, Manipulator faces unanticipated resistance.

By contrast, both the Carrot and Stick equilibrium E1a and its mixed strategy extension E3a exist if and only if Manipulator believes it highly likely that Target is circumspect. When Manipulator is likely honorable, both types of Manipulators issue a demand with certainty (under E1a). But as the likelihood rises that Manipulator is perfidious, prompting circumspect Targets to sometimes resist (under E3a), perfidious Manipulators sometimes compensate by issuing a demand.

The Separating equilibrium E2 exists in an intermediate zone where the probability that Target is steadfast is not so low that perfidious Manipulators will press for a change in the status quo, but not so high as to dissuade an honorable Manipulator from issuing one. Under these conditions, circumspect Targets always comply.

Finally, as mentioned previously, in our special case analysis, a Deterrence equilibrium will always exist. In the gray regions of Figure 2b, they uniquely exist. More specifically, ED1, ED3 and ED5 uniquely exist in the region just above that of the Separating equilibrium, and E1 and E4 are the only rational strategic possibilities in the area to the left of the area in which E1b and E3b exist. The specific beliefs that give rise to these and the other Deterrence equilibria are detailed in the Online appendix.

Explaining the Munich Agreement

The course of the negotiations and the final agreement reached at Munich is best understood in the context of the equilibrium structure of the Carrot and Stick Game.[11] We begin with what we know.

In the wake of likely British, French, and Czech resistance after Bad Godesberg, Hitler backed down from his most extreme demands. In the process he revealed his preference for a negotiated settlement over either of the two

[10] It may lead to a demand because two different deterrence equilibria, ED1 and ED4, also exist under these conditions. See the Online appendix for details.

[11] Harrington (2015: 359–364) also analyzes the Munich crisis as a game of incomplete information. His analysis, however, does not take account of Hitler's initial decision to foment a crisis or explain why he eventually backed down and agreed to a conference.

outcomes possible whenever Target resists. In the terms of our model, because he wished to avoid an all-out conflict with the Western powers, he revealed his preference to honor his pledge not to immediately annex the Sudetenland militarily, that is, either he was honorable and reluctant, or he acted as if he were. But since Honorable/Reluctant Manipulators always issue a demand under any of the five perfect Bayesian Equilibria that exist under our assumptions on the parameter values, none can be eliminated logically or empirically. For that, we need to examine Hitler's beliefs about Great Britain's type.

We also know that until Munich Hitler believed, despite numerous half-hearted warnings, that the British were most likely bluffing, that is, were likely irresolute (Bouverie, 2019: 235). Hitler's strong belief is inconsistent with all but the Carrot and Stick equilibria E1b/E3b. Under each of the remaining perfect Bayesian equilibria, irresolute Targets always resist. The argument here is up to and immediately after the meeting at Bad Godesberg, Hitler expected play to follow the strictures of E1b/E3b. Note, however, that under either E1b/E3b, Circumspect/Steadfast Targets always resist. Given the unexpected reaction to his demand for an immediate occupation of Sudetenland, play under E1b/E3b was no longer attractive. So he suddenly changed his tune.

It is, of course, impossible to know whether Hitler was honorable all along[12] or whether his preferences simply 'deteriorated' once he sensed that the British and French would take a stand (Faber, 2008: 389).[13] Either way, play under E1a suddenly became much more attractive. To understand how (and why) he might attempt to shift play to E1a/E3a under which Circumspect/Steadfast Targets always (or generally) comply, it will be instructive to refer again to Figure 2b.

E1b/E3b exist if and only if two conditions are satisfied. The first, of course, is that Target's updated probability that Manipulator is both perfidious and determined (q_{PD}) exceeds n_{DI}, the resist threshold of a disruptive yet irresolute Target. The key, however, is Manipulator's belief that Target is likely irresolute and therefore certain to comply. The unexpected resistance of the British-led coalition after Bad Godesberg clearly undermined that belief.

To induce compliance (and avoid a war that Hitler had been warned would not end well), he was forced to signal that he was in fact honorable (and also reluctant.) This he did at the last hour (28 September), first by agreeing to postpone mobilization by 24 hours and, shortly thereafter, by agreeing to the conference at Munich where an outcome was attained that was consistent with the existence conditions of E1a/E3a.[14] The British, French, and Germans then agreed, amongst themselves, precisely how Czechoslovakia would be carved up.[15]

Summary and conclusion

In this essay we explore the strategic characteristics of the carrot and stick approach to coercive diplomacy. Under complete information there are certain conditions under which a credible promise or a credible threat, used in isolation, is not adequate as a crisis bargaining

[12] It is possible that Hitler was reluctant all along. In a directive issued in June he stated that he would move against Czechoslovakia only if he were convinced that the French and British would not intervene (Churchill, 1948: 260).

[13] Howard (1971: 199–200) defines preference 'deterioration' as a 'strategically motivated' change of preferences. Hitler's about face could also be interpreted as an instance of 'tacit deception' where for strategic reasons a player makes a false announcement of its preferences and acts consistently with its announcement, or, if the time-line of the crisis is extended by six months, of 'revealed deception' wherein it acts consistently with its actual preference. For the details, see Brams & Zagare (1977).

[14] Manipulator must be seen as likely honorable. One might argue that the behavioral dynamics at Munich could also have taken place under E2 since only honorable Manipulators issue a demand and only circumspect and steadfast Targets comply. The underlying argument, however, would not significantly change.

[15] To be clear, we do not claim to have described the many twists and turns that the negotiation process took in the latter part of September 1938. No simple game-theoretic model could possibly capture the specifics of all of them. Rather than describe these details, which a number of diplomatic historians have already done in great detail, we tried to explain the results of what we consider to be an ongoing search for an equilibrium by real-world players. This equilibrium, of course, had to be consistent with both the beliefs and the expectations of the players at the crisis's denouement when the leaders of Germany, Italy, Great Britain and France reached what, unfortunately, turned out to be a temporary agreement. Specifically, Chamberlain's initial belief was that Hitler was honorable, which is to say he believed that Hitler's demands were limited. In consequence, he was prepared to comply with Hitler's demand for a nonviolent revision of the status quo. If the negotiations had ended at this point, there would have been no crisis. But they did not. To Chamberlain's surprise and chagrin, Hitler raised the stakes, but then quickly backed down in the face of unexpected internal and external resistance. In essence, wanting to avoid a great power conflict or a humiliating diplomatic defeat, a counterfactual that cannot be established with certitude, he either reverted to, or revealed his type. The endgame equilibrium reached at Munich reflected both the players' action choices and the beliefs required to support them. Our assertion, therefore, is that our model helps to *explain*, but does not necessarily *describe* or track what is on its face a rich and complex empirical 'event' that played out in real time over a period of more than two weeks.

mechanism. As George (1991) recognizes, coercive diplomacy does not always work. But when used in tandem, credible promises and credible threats are *always* successful, at least from the manipulating actor's point of view. To put this in a slightly different way, there is no sure-fire way for a state to ward off a challenge (Zagare, 2020). Deterrence, therefore, may fail even when a target is Steadfast and prefers *Conflict* to *Manipulator Wins*, suggesting, once again, that contentious interstate relationships are complex and at the same time extremely sensitive to the underlying strategic milieu (Zagare & Kilgour, 2000).

The situation is less straightforward when information is incomplete. The dynamics of the Carrot and Stick approach to coercive diplomacy are considerably more nuanced than George's (1991) discussion of the Cuban missile crisis or Leng's (1993: 41) analysis of the 1973 alert crisis in the Middle East suggests. Neither George nor Leng are specific about the details of a carrot and stick approach to coercive diplomacy, other than to say that the stratagem involves both a threat and a promise. As we have discovered, there are many variants of the Carrot and Stick Game, and these variants can be complex and exhibit a range of strategic characteristics.[16] We anticipate that these differences will only become more apparent when, in a follow-up study, we relax some of our simplifying assumptions about the players' types.

Perhaps our most unexpected finding concerns the ubiquity of deterrence equilibria, which runs counter to a result from a complete information analysis of the Carrot and Stick Game: there is *always* some condition under which the status quo may prevail.[17] Surprisingly, perhaps, even though we have assumed away the conditions most conducive to successful deterrence, there are some conditions under which the status quo is the only possible outcome. But this is not to say that peace is always at hand. As when information is complete, irresolute targets constitute a tempting target for potential manipulators, honorable or not. In other words, it is frequently the case that a deterrence equilibrium co-exists with another equilibrium under which the status quo will be challenged (see the Online appendix for details).

In the Carrot and Stick Game all-out conflicts are possible only when information is incomplete. Of course, for a conflict to occur, a potential manipulator must be determined. But while necessary, it is not sufficient. Target must also plan to resist. Conflict, then, is a distinct possibility under all but the Separating equilibrium wherein only Honorable/Reluctant Manipulators attempt to alter the status quo. On the other hand, intense interstate disputes are most likely under precisely the conditions that existed just prior to the conference at Munich when a risk-taking manipulator attempted to face down a suddenly steadfast target.

The invasion of Poland in 1939 is a case in point. Just prior to the German attack, Hitler tried the same ploy he had used at Bad Godesberg: he increased his demands at the very last moment. In his meeting with the British Ambassador to Germany, he unexpectedly raised the stakes, demanding not only the return of Danzig and the Polish Corridor but also safeguards for German minorities living in Poland (Overy, 2009: 58). But, this time, the British were unable to convince him that they were steadfast. As he reportedly remarked about the British and French at the time, 'I saw them at Munich. They are little worms' (Kagan, 1995: 412). Even after the 1 September invasion, Germany's Chancellor continued to believe that 'they'll chicken out again' (Overy, 2009: 76). As our model suggests, the results were predictable.

Incomplete information, then, is a double-edged sword. Sometimes it enhances the prospects for peace and, at other times, increases the risk of conflict.[18] It should be clear, then, that the beliefs of political elites, rather than some objective national interest or systematic characteristic, will oftentimes be the difference between a crisis or a war and the absence of a manipulative bargaining attempt. Although this is not surprising, it seems safe to say that in some real sense the Munich crisis was manufactured, that is, that it was in no way inevitable. Indeed, some members of the German military establishment had very sound strategic reasons for wanting to get rid of Hitler in the run-up to the conference (Shirer, 1960: 497–521) and afterward.

Fortunately, in 1938, before a war could break out, Hitler realized that the British and French, not to mention the Czechs, were no longer ready to comply with his

[16] Depending on specific parameter values, one of four strategic environments, each with a similar, albeit distinct, equilibrium structure, will exist. Space considerations preclude a discussion of these subtle differences. A more comprehensive Online appendix in which these details are made explicit is available on request.

[17] The existence of a deterrence equilibrium itself is not surprising. What was unexpected is the fact that there is always such an equilibrium, at least in the version of the Carrot and Stick game we examine.

[18] We say this for two reasons. Given our assumptions, conflict is not possible when information is complete, but it can occur in equilibrium under incomplete information. Conversely, the fact that a deterrence equilibrium will always co-exist with all other non-deterrence equilibria under which the status quo does not survive rational play suggests that the opportunity for a non-event (i.e. peace) is enhanced when information about preferences is not common knowledge.

increasingly exorbitant demands, that is, that they were likely both circumspect and staunch (Overy, 2009: 28–32), a preference, it should be noted, that is consistent with a tit-for-tat approach to coercive diplomacy. Collectively, the two democracies signaled, much to Hitler's chagrin, that they would cooperate, but only if he did too.

In closing we also should point out that the Carrot and Stick Game models, simultaneously, what is oftentimes thought of as two distinctive manipulative bargaining milieux: compellence and deterrence (Schelling, 1960, 1966).[19] Our claim, however, is that these two ostensibly distinct conflict situations are but one, that is, a situation in which a manipulator considers compelling a target's behavior with both a carrot and a stick, while a target prefers that no such attempt be made. Clearly, attempts to compel imply *immediate* deterrence failures, as at Munich in 1938.

Acknowledgments

An earlier version of this article was presented at the Scientific Study of Interstate Conflict conference at The University at Buffalo, SUNY, 22–23 October 2021. We thank the participants at the conference, Steven J Brams, Bruce Bueno de Mesquita, Joe Clare, Ray Dacey, Vesna Danilovic, Jacek Kugler, Stephen Quackenbush, John Vasquez and, especially, Lisa Carlson for their thoughtful comments and suggestions.

Funding

D Marc Kilgour acknowledges the support of a Discovery Grant from NSERC, the Natural Sciences and Engineering Research Council of Canada.

ORCID iD

Frank C Zagare https://orcid.org/0000-0002-9672-9263

Supplementary material

The Online appendix is available at https://www.prio.org/jpr/datasets.

References

Bouverie, Tim (2019) *Appeasement: Chamberlain, Hitler, Churchill, and the Road to War*. New York: Tim Duggan.

Brams, Steven J & Frank C Zagare (1977) Deception in simple voting games. *Social Science Research* 6(3): 257–272.

Churchill, Winston S (1948) *The Gathering Storm*. Boston, MA: Houghton Mifflin.

Davis, James W Jr (2000) *Threats and Promises: The Pursuit of International Influence*. Baltimore, MD: Johns Hopkins University Press.

Dorussen, Han (2001) Mixing carrots with sticks: Evaluating the effectiveness of positive incentives. *Journal of Peace Research* 38(2): 251–262.

Faber, David (2008) *Munich, 1938: Appeasement and World War II*. New York: Simon and Schuster.

George, Alexander L (1991) *Forceful Persuasion*. Washington, DC: United States Institute of Peace.

Greffenius, Steven & Jungil Gill (1992) Pure coercion vs. carrot and stick offers in crisis bargaining. *Journal of Peace Research* 29(1): 39–52.

Harrington, James E Jr (2015) *Games, Strategies, and Decision Making*. New York: Worth.

Howard, Nigel (1971) *Paradoxes of Rationality: Theory of Metagames and Political Behavior*. Cambridge, MA: MIT Press.

Kagan, Donald (1995) *On the Origins of War and the Preservation of Peace*. New York: Doubleday.

Kreps, David M & Robert Wilson (1982) Sequential equilibria. *Econometrica* 50(4): 863–879.

Leng, Russell J (1993) *Interstate Crisis Behavior, 1816–1990: Realism Versus Reciprocity*. New York: Cambridge University Press.

Massie, Robert K (1991) *Dreadnought: Britain, Germany, and the Coming of the Great War*. New York: Ballantine.

Overy, Richard (2009) *1939: Countdown to War*. New York: Penguin.

Rock, Stephen R (2000) *Appeasement in International Politics*. Lexington, KY: University of Kentucky Press.

Sartori, Anne E (2002) The might of the pen: A reputational theory of communication in international disputes. *International Organization* 56(1): 121–149.

Sartori, Anne E (2005) *Deterrence by Diplomacy*. Princeton, NJ: Princeton University Press.

Schelling, Thomas C (1960) *The Strategy of Conflict*. Cambridge, MA: Harvard University Press.

Schelling, Thomas C (1966) *Arms and Influence*. New Haven, CT: Yale University Press.

Shirer, William R (1960) *The Rise and Fall of the Third Reich*. New York: Simon and Schuster.

Smith, James (n.d.) The Munich crisis. Unpublished manuscript, University at Buffalo (http://www.acsu.buffalo.edu/~fczagare/Conflict%20Among%20Nations/6.%20Munich%201938%20Smih.pdf).

Snyder, Glenn H (1997) *Alliance Politics*. Ithaca, NY: Cornell University Press.

Snyder, Glenn H & Paul Diesing (1977) *Conflict Among Nations: Bargaining, Decision Making and System Structure in International Crises*. Princeton, NJ: Princeton University Press.

[19] For example, Greffenius & Gill (1992) draw a sharp distinction between a deterrence and a carrot and stick bargaining approach. This is most evident in their discussion of the 1967 war in the Middle East and the 1991 Gulf War. In so doing they implicitly assume that Manipulator is both perfidious and determined. By contrast, our integrated model takes account of this possibility, but of other possibilities as well.

Zagare, Frank C (1987) *The Dynamics of Deterrence*. Chicago, IL: University of Chicago Press.
Zagare, Frank C (2019) Game Theory, Diplomatic History and Security Studies. Oxford: Oxford University Press.
Zagare, Frank C (2020) The carrot and stick approach to coercive diplomacy. *International Journal of Development and Conflict* 10(1): 105–115.
Zagare, Frank C & D Marc Kilgour (2000) *Perfect Deterrence*. Cambridge: Cambridge University Press.
Zagare, Frank C & D Marc Kilgour (2003) Alignment patterns, crisis bargaining, and extended deterrence: A game-theoretic analysis. *International Studies Quarterly* 47(4): 587–615.

FRANK C ZAGARE, PhD in Political Science (New York University, 1977); UB Distinguished Professor, University at Buffalo (1987–); current research interest: interstate conflict. Most recent book: *Game Theory, Diplomatic History and Security Studies* (Oxford, 2019).

D MARC KILGOUR, PhD in Mathematics (University of Toronto, 1973); Professor of Mathematics, Wilfrid Laurier University (1973–). Most recent book (co-edited with Colin Eden): *Handbook of Group Decision and Negotiation*, 2nd edn (Springer Nature, 2021).