

A Behavioral Approach to International Cooperation

Emilie M. Hafner-Burton, Brad L. LeVeck, David G. Victor, and James H. Fowler

Abstract: International relations theories have largely ignored the role of individual people who play key roles in treaty design and participation; instead, that scholarship assumes that other factors, such as treaty enforcement, matter most. We use experiments drawn from behavioral economics and cognitive psychology—along with a substantive survey focused on international trade treaties—to illustrate how two traits (patience and strategic skills) could influence treaty outcomes. More patient and strategic players favor treaties with larger numbers of countries (and thus larger long-term benefits). These behavioral traits had much larger impacts on simulated treaty outcomes than treaty enforcement mechanisms. This study is based on a sample of 509 university students yet provides a baseline for future experimental and survey research on actual policy elites who design and implement treaties; a preliminary sample of 73 policy elites displays the same main patterns described in this paper.

For years the scholarship on international institutions—whether focused on transaction costs, domestic politics or forces such as structure and culture—has largely assumed that the behavioral traits of individual decision makers didn't much matter because the larger interests and ethos of states, the flow of information and the international structures within which state governments attempted to cooperate largely determined preferences for cooperation. That scholarship assumed, often implicitly, that individual decision makers in the same situation tend to think alike about cooperation, and specifically, about the design and appeal of international institutions.

Here we suggest that behavioral traits also shape how people approach the tasks—such as treaty design and ratification—that are central to international cooperation. Variation in the behavioral traits of individual decision makers and the contexts in which decisions are made shapes their preferences for the design and appeal of international institutions. Their preferences, in turn, may have consequences for cooperation. Indeed, people of similar backgrounds, political affiliations and training often espouse radically different strategies when faced with similar challenges in international cooperation. Carla Hills, the US Trade Representative under President George H.W. Bush, said that the failure of the Doha round was due, in part, to lack of awareness by the US public of what is at stake for the country (Hills 2005). Susan Schwab, working in the same job for a president of the same party (the elder Bush's son, George W. Bush) suggested that Doha's troubles lay chiefly with the challenge of negotiating with 152 countries (at the time) across so many issues (USTR 2008). For Hills, a strategy for crafting more effective trade agreements required a more active public relations effort at home; for Schwab, it required reducing the complexity in the structure and content of international bargaining. Two elites—each able to have substantial influence over what their government did in international

relations—espoused radically different policy designs when faced with the same challenge. Perhaps their behavioral traits shaped their policy strategies.

This paper is about how different behavioral traits shape the preferences of individuals, not the ultimate outcomes of international cooperation such as the level of international trade. Nonetheless, individual preferences and their determinants are important to study for at least three reasons. First, scholars long ago noted that the people sitting at the negotiation table and those that make decisions to join agreements have substantial autonomy on their own—they are not merely perfect agents for underlying interests and structures (see Putnam 1988; Evans, Jacobson, and Putnam 1993; Shamir and Shikaki 2005). They have personal styles, opinions, and predilections, as well as formal and informal permissions and job flexibility, which give them degrees of independence from their principals (Hawkins et al. 2006). Second, while it is likely that the path between individual preferences and international cooperation outcomes are strongly mediated by the institutions and interactions inherent in collective decision-making, it is also useful to scrutinize the factors that shape individual preferences apart from these processes. To understand how international and domestic institutions ultimately mute or magnify the impact of behavioral traits it is necessary to know what individuals with these traits would prefer in the first place.

Third, and most importantly, key decisions in the design and implementation of international agreements often take place in small groups where a few decision-makers have inordinate influence. In crafting a round of trade talks, a small group of decision makers—usually drawn from the most powerful countries and the secretariat of the WTO—make the final decision about topics to place on the agenda. The successful resolution of trade talks usually hinges on the efforts of a few negotiators—often the Director General of the WTO himself—to

craft a final negotiating text from many different competing proposals. That text reflects political and perhaps also behavioral decisions about which elements of a trade agreement are most and least important. And decisions about ratification in important countries like the United States require a deal that is crafted with the authority of a few leaders in the executive and legislative branches. Such decisions often take place in the context of a crisis or with a looming deadline that concentrates minds and, for efficiency, shrinks the number of people in the room.¹ This pattern is hardly unique to trade. In most other areas of complex international cooperation the final deals reached are the work of a few people—for example, brokering the main agreement at the 2009 Copenhagen Conference were the heads of state from just 5 countries with few other individuals sitting around the table (e.g., Broder 2009). To be sure, decision-making institutions such as bureaucracies matter for international affairs, but at pivotal moments perhaps the role of individuals has been under-appreciated because it has been hard to study and describe individuals systematically.

This article is hardly the first to suggest that behavioral traits are important. It is well understood that people's attitudes, preferences, emotions, and even biology shape decisions that are typical of foreign policy (see Tomz 2004 and 2008; Fowler and Schreiber 2008; Putnam and Shapiro 2009; Hafner-Burton, Hughes, and Victor 2011; Byman and Pollack 2001; McDermott 2007; Hatemi and McDermott 2011). People are the originators and conduits for ideas, which figure prominently in some international relations scholarship (for example, see Goldstein and Keohane 1993). Indeed, for years scholars of foreign policy focused on individual elites, but they

¹ These points are regularly emphasized by “insider” accounts of international negotiations. For example, on the 1992 Rio Conference see Brenton (1994); on the US-Canada free trade talks that were precursors to NAFTA see Hart (1994).

tended to treat each elite in an idiosyncratic manner—for example, President John F. Kennedy’s and Barak Obama’s inexperience was thought to make each of them initially unable to form opinions independent of military advisers (on Kennedy see Schlesinger 1965, chapter 10; on Obama see Woodward 2010). Other studies have explored how illness might influence leadership and policy preferences—such as how Kennedy’s medication for Addison’s disease may have also influenced his policy decision-making (on illness and leadership, see notably McDermott 2007; on Kennedy, in particular, see Gilbert 1998, 165). The list of studies focused on idiosyncratic, individual decision-making is long and includes the whole broad field of political biography (see Halberstam 1972; Isaacson and Thomas 1986). Certain behavioral traits may make elite decision makers prone to error, leading to misperceptions, accidental wars and other foreign policy outcomes (see Jervis 1968 and 1976; Johnson 2004). Yet, the suggestion that decision makers’ behavioral traits shape their policy preferences has not made much headway into the accepted cannon of research on international institutions, which remains largely focused on the interests of core state institutions as well as the interest groups, structures and political and cultural forces that shape them.

Our central claim is that certain behavioral traits of the people tasked with making international cooperation decisions help to explain their preferences when negotiating and joining international agreements such as treaties. We do not dismiss the importance of other factors—such as structure, interest groups, function or culture—which can all generate the demand for an institution and constrain and inform choices such as design. We simply draw attention to the roles that individual traits also may play in shaping decision makers’ preferences for international cooperation. One implication of our claim is that different types of people in the same situation may prefer to approach professional policy tasks and adopt different goals in

materially different ways. Future research may uncover ways in which national governmental and international institutions interact with the linkages we find between behavioral traits and preferences. For example, it may turn out that states select negotiators who are more patient or strategic, or, that they try to train individuals to become more patient or strategic.²

It is also important to be clear that by “behavioral trait” we are simply referring to a behavioral tendency that, at a given point in time, is stable across similar types of decisions (in contrast to “state” which often refers to emotional or other fleeting responses to a situation). For example people who are patient are more willing to wait for greater rewards across a number of scenarios. Our argument is not that behavioral traits are immutable. While studies have shown that some of the traits we explore in this paper, such as patience, can be quite stable over a person’s life (Mischel, Shoda, and Peake 1988; Funder, Block, and Block 1983) (and may even have a partially genetic basis (Anokhin et al. 2011)), there is also evidence that people can be trained to make fewer impulsive choices, which have been linked to the measures of impatience we use (Muraven 2010).

Our starting point is the burgeoning research in experimental psychology and behavioral economics, which shows that people have many distinct behavioral traits, some of which can drive their social and strategic performance (for a review see Hafner-Burton, Hughes, and Victor 2011; in particular, see Neale and Bazerman 1985; Knetsch 1989; Chen and Chaiken 1999, 73–96; Costa-Gomes and Zauner 2001; Camerer, Ho, and Chong 2003; Fehr and List 2004; Fowler and Schreiber 2008; Tingley and Wang 2010; Tingley 2011). We focus on two such traits—

² We thank Robert Jervis for (in a personal correspondence) pointing out that the State Department does try to train its personnel to think more strategically, and consider how others will react to their own decisions.

patience and strategic skill—that are particularly likely to be important in the bargaining situations that pervade international cooperation.³ First, international relations theorists have long known that one of the key functions international institutions perform is to lengthen the shadow of the future (see Koremenos, Lipson, and Snidal 2001; Koremenos 2001)—that is, to convince participants that the promises they make inside an institution will be ongoing for some period of time to come. Longer shadows are thought to facilitate more cooperation (Axelrod 1984). Indeed, while international relations theorists disagree about a lot, this cooperation-enhancing role of the shadow of the future is one theory that commands widespread acceptance. A behavioral trait that shapes a person’s shadow is *patience*. Patient people have lower discount rates; they are more willing to wait for larger benefits that accrue in the distant future rather than seize smaller but more immediate gains. Patience, thus, may affect a decision maker’s willingness to support international cooperation through institutions such as treaties, especially when participation within these institutions entails proximate costs but yields the possibility of large yet more remote benefits (see Koremenos, Lipson, and Snidal 2001; Fowler and Kam 2006).

Second, the design and implementation of international institutions also reflects the strategic situation (Stein 1982). How a state behaves depends on what it expects other countries

³ We are mindful that scholars in American politics have looked at a somewhat different battery of behavioral traits—the “big 5,” which decompose personality into five main traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. For a review see Gerber et al. 2010. See also Mondak and Halperin 2008; Vecchione and Caprara 2009; and Mondak et al. 2010. The two traits we examine map partially on to the “big 5,” but for international relations scholarship, where the tasks of decision makers are a bit different, the traits we study are a reasonable place to begin exploring whether and how personality actually matters.

to do and on the vulnerability that each state has to others defecting—in other words, cooperation depends on the game type.⁴ Just as strategic situations vary, people also vary in what we will call *strategic skills*—the ability to anticipate how their counterparts will respond in a bargaining situation and adjust their own response accordingly. Some people are like good chess players, able to anticipate many moves in advance. Others behave as if they are islands—unaware of or uninterested in what other people know or how they are likely to behave strategically. When confronted with the same problem of international cooperation, decision makers with varied strategic skills may very well respond differently—they may favor different types of agreements and perform differently when tasked with varied strategic challenges.

We explore how these two behavioral traits might affect preferences for different types of policy choices with a series of experiments and surveys on a convenience sample of 509 people. In doing so, we join a promising literature that uses survey experiments to probe how individuals make decisions related to international relations (see Tomz 2004 and 2008; Putnam and Shapiro 2009; Hainmuller and Hiscox 2010; Gartner 2011; Grieco et al. 2011; McDermott 2011; Mintz, Yang, and Mc Dermott 2011; Tingley and Walter 2011a, 2011b; Tingley and Wang 2010; Tingley 2011; Trager and Vavreck 2011). Using standard “games” drawn from behavioral economics, we measure traits for each subject. We also pose more real-world scenarios in which subjects face tasks that are typical of major decisions that arise during the formation of international economic institutions. Those decisions correspond to two different phases of international cooperation—namely, the negotiation of a treaty to liberalize trade and the decision whether to join a treaty through ratification. We have chosen to focus on these two phases

⁴ For a recent review of political science research on international legal institutions, including empirical work drawn from game theory, see Hafner-Burton, Victor, and Lupu 2012.

because they have generated abundant research and are central to all theories of treaty cooperation (on design, see: Kahler 1992; Smith 2000; Raustiala 2005; on ratification, see: Mansfield and Pevehouse 2008; Hug and König 2002). Policy makers also behave as if these actions are important—something revealed by the huge literatures on matters such as treaty design and mechanisms such as Trade Promotion Authority that are intended to shape the ratification process (for example, Card and Daschle 2011). Through experimental treatment we explore how people with different measured behavioral traits respond to standard challenges at each phase, such as whether a treaty should be designed to allow broad participation or whether expectations of enforcement and compliance influence preferences for ratification.

As with nearly all experimental research that explores behavioral traits, our study sample consists of college undergraduate and master's students. *We do not claim that this sample is perfectly representative of the population of elites who make real-world decisions about international cooperation.* In fact, we would be very surprised if elites behaved exactly the same way as college and master's students, and for this reason we are currently engaging in a related project to measure elite traits and behavior. But starting with a convenience sample is important because, at present, scholars know very little about the effect of behavioral traits on preferences for international cooperation in *any* population, elite or otherwise. While college students may be different from elites—a subject we return to at the end of this article—their behavior may still be relevant. For example, elites have been selected into their jobs and they acquire on-the-job experience, both of which may affect the distribution of traits (for example, they may be more patient or more strategic on average than college students). However, the relationship between behavioral traits and decision-making in the population from which decision-makers are drawn is likely to be informative, regardless of differences in the distribution. Taking an example from

American politics, consider the well-known relationship between age and voter turnout (Powell 1986). Elites will be older than college students, but the relationship between age and turnout is the same for both groups – older elites are more likely to vote than younger elites, just as older college students are more likely to vote than younger students.

There have been some studies comparing the personal attributes of non-elite populations such as college undergraduates with highly trained and experienced elites (Mintz, Redd, and Vedlitz 2006. Notably, see List 2003 and List and Mason 2009 regarding loss aversion; Hedinger and Götte 2006 regarding Trust; Cooper et al. 1999 regarding frames of reasoning; Ackerman and Schneider 1985 regarding systematic vs. automatic cognitive processing), but few have focused on the two behavioral traits we examine here.⁵ Our work thus offers a benchmark for explaining how individual behavioral traits might influence preferences for treaty design and participation, and it also offers a frame for comparing how real policy elites might differ from non-elites.

The results of this benchmark analysis suggest that preferences regarding treaties depend—in part and possibly a lot—on the traits of the decision-makers, quite apart from the functional problems they are charged with solving. This analysis also suggests that behavioral traits may have an effect on preferences that is of the same magnitude as some of the factors that have dominated international relations theory such as formal enforcement mechanisms—an institutional design feature that has been dominant in scholarly debates over the function and effect of international agreements.

⁵ For an exception see Palacios-Huerta and Volij (2009). Also see Camerer (2003, 217) for previously unpublished data on the beauty contest games played among different sets of individuals (from highly experienced traders to economic Ph.D. students to CEO's).

Study Design

Our aim in this study is to link behavioral traits to choices about international treaty cooperation in different situations. We thus asked our subjects to participate in a survey experiment in two parts. One part asked them to self-report how they would respond to different scenarios and choices about an international trade agreement.⁶ The other part asked subjects to play a battery of behavioral economic games from which we have elicited information about behavioral traits. In addition, we also asked a standard set of demographic questions that collect information about age, sex, and political party identifiers.

Both the survey questions and behavioral games in our study were administered as part of a larger omnibus study where subjects participated in a number of short surveys and experimental tasks contributed by different researchers. The order in which subjects participated in each task was randomized so as to avoid any potential order effects. While we only report the questions and games relevant to the current paper, a full list of the tasks subjects participated in is available upon request.

We conducted our study during the Fall of 2010 and Winter of 2011 at the Rady School of Business's behavioral computer lab, located on the University of California San Diego's campus. A total of 509 participants were recruited from undergraduate classes in the Political Science department, as well as two first-year masters courses at UCSD's school of International Relations and Pacific Studies. Students were compensated for participating in the study by receiving extra-credit in the class from which they were recruited; all participants also had the chance to win monetary rewards from a lottery, whose value depended on how they and other

⁶ We randomized the order in which our subjects took each part of the survey.

respondents played the experimental games used in the study. Instructions for both the games and the survey were presented to subjects on computers in the lab using Qualtrics survey software. The entire enterprise was approved and overseen by UC San Diego's Human Research Protections Program.

Measuring Preferred Choices about Institutional Design

Much of formal international cooperation starts with the creation of international treaties and states' buy-in through membership. Designing and joining an international treaty depends on a large number of choices. In our survey we focus on two that correspond with topics that have attracted special attention by scholars: complexity and enforcement. Scholars have explored how different choices in the design of agreements depend on the complexity of cooperation (Alter and Meunier 2009). And a long-standing, central concern is whether and how international cooperation requires formal enforcement mechanisms such as dispute resolution procedures (see Fearon 1998; Gilligan 2006; Donno 2010). These are not the only choices that influence international cooperation, but they are among the most important and investigated.

To measure how subjects managed tradeoffs involving complexity, we asked them to choose how many countries should be involved in the negotiation of a trade agreement. The survey included explicit instructions noting that while adding more countries to the negotiations would further their country's aim of having the agreement cover the largest fraction of world trade, the extra voices would make bargaining more complicated and introduce additional risks that the content of the agreement would be diluted. Responses were in a category from 1 to 4, with each category increasing the number of countries invited to negotiate the treaty.⁷ We

⁷ Full information is provided in Section B of the SI.

expected that subjects who found strategically complex and lengthier negotiations less burdensome would invite more countries in this scenario, and thus pick a higher category.

To measure how the presence of enforcement affected subjects' willingness to join a trade agreement, we randomly assigned subjects to one of two experimental conditions. In each condition the description of the trade agreement was the same except for one sentence that indicated whether the treaty included a formal enforcement mechanism.⁸

Measuring Behavioral Traits

To measure behavioral traits we rely on behavioral games rather than traditional survey based measures for two reasons. First, unlike traditional surveys that ask subjects to categorize their own traits—say, by rating their own level of patience—behavioral games are based on a mathematical model of economic behavior, giving researchers a common baseline against which to compare subjects' behavior.⁹

Second, unlike traditional surveys, the games used in this survey force subjects to make decisions that are linked to tangible outcomes (real monetary stakes) and thus are probably a more accurate elicitation of underlying traits. This is especially important when studying factors like patience that are perceived to be socially desirable and thus may be prone to biased self-

⁸ Subjects in the enforcement condition were told:

“An independent enforcement mechanism promptly and credibly punishes any country that does not comply by taking away some of the benefits of the treaty from the country that breaks the rules.”

Subjects in the non-enforcement condition were told:

“The treaty does not provide any formal mechanism to punish countries that fail to comply.”

⁹ See Camerer 2003.

reporting (see Mischel 1974; Kagan 1988; Schwarz 1999; Berinsky 2004; Webb et al. 2000). The average monetary stakes that subjects faced in our experiments were quite small because a lottery (for \$100) paid only a small number of subjects. However, other studies have shown that similarly small incentives are adequate for eliciting accurate responses (see Camerer and Hogarth 1999; Palfrey and Wang 2009), even when decisions were elicited with a single prize (Coller and Williams 1999). Furthermore, a number of studies have reliably found a link between behavior in lottery-incentivized games and real world political behavior (see Fowler 2006; Fowler and Kam 2006 and 2007; Dawes, Loewen, and Fowler 2011).

Patience

As we argued above, one behavioral trait that we expect to influence a person's preferences for cooperation is their level of *patience*. International cooperation frequently involves sacrificing pay-offs that are immediate for benefits that are delayed. Patience should affect a person's preferences related to international cooperation in at least two ways in our study.

First, when tasked with negotiating a treaty, patience should affect how a decision maker decides to pursue treaty negotiations. Different bargaining strategies can substantially influence the length of negotiations and their prospects for success. For instance, including more countries in negotiations could potentially bring greater benefits in the long run because agreements would engage a larger share of the world economy but risk that negotiations might drag on, delaying the benefits of cooperation (Martin 1995). Thus, our first hypothesis is that patient people in our study will be more willing to pursue complex negotiations, involving more countries, even though doing so may delay the completion of negotiations.

Second, when tasked with the decision whether to join an international treaty, patience should affect whether a decision maker views the commitment favorably. We thus also anticipate that the type of person who is generally willing to wait for higher payoffs – a patient person – will be more willing to engage in international cooperation, and join the treaty, than the impatient type who seeks more immediate gratification.

Our arguments about patience, applied here for the first time (to our knowledge) to international treaty cooperation, have a strong counterpart in formal models of international bargaining. Powell (1999) noted that many bargaining models are sensitive to assumptions about how much states value future payments. More patient states are more willing to bargain for longer periods of time in order to secure peace rather than immediately secure a less valuable outside option. Leventoğlu and Tarar (2008) formalized this argument, showing that whether or not a negotiated settlement is attainable in many models of bargaining under incomplete information depends on the patience of bargainers. These insights could also inform decision makers' preferences for cooperation where the rewards are more favorable trade agreements instead of the peaceful division of a prize.

To measure how much subjects value the future – that is, their level of *patience* – we adapted a “choice game” introduced by Coller and Williams (1999). Here we refer to this game as a time-discounting task in order to more intuitively evoke the game's purpose. Past studies have linked behavior in this task to real world behavior, such as savings rates (Harrison, Lau, and Williams 2002). The game has also been used in political science to explain why some individuals are willing to vote when the benefits from voting almost always occur in the distant future (Fowler and Kam 2006).

In our study (and in others using this task), our subjects were asked to make 20 different choices between a prize that would be paid to them within 30 days after taking the study and a larger prize that would be paid within 60 days. Following Fowler and Kam (2006), in each choice, the 30-day prize was \$100, while the 60-day prize varied from \$100.17 to \$123.07. Subjects were told that at the end of each academic quarter we would randomly draw one winner, and then randomly select one of the 20 choices and pay the winner according to their choice. (Full instructions can be found in the SI). This promise was credible, as all sessions of our study were held within 30 days of the quarter ending, and the subjects in our study knew this.

For each subject, the point at which they switched from taking the 30-day prize to the 60-day prize is a measure of the subject's discount rate. If subjects made no mistakes, and discounted future payments at a constant rate, then this implied an equality $p > df$ over the time period in question, where p is the value of a prize in the present time period, f is the value of the prize in the future time period and d is the factor by which a subject discounts future payments. In practice it has proved difficult to interpret discount rates measured this way.¹⁰ Thus we adopt a simpler approach of measuring a subject's patience as the total number of 60-day choices they made rather than calculating a falsely precise discount factor.¹¹

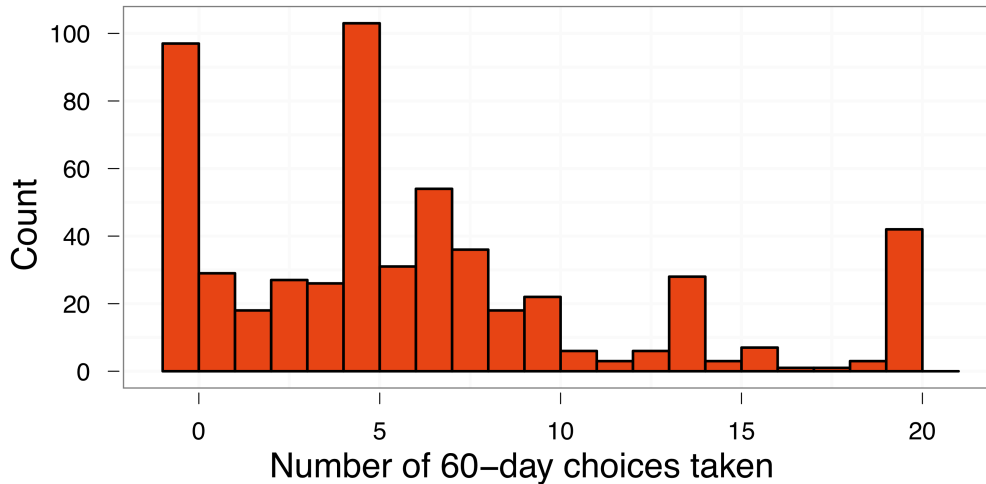
Figure 1 shows the distribution of time discounting choices made by subjects in our study, which is similar to choices found in many other studies (Coller and Williams 1999; Fowler and Kam 2006). The modes at the extremes indicate that many subjects either always choose one

¹⁰ Many studies have found evidence for hyperbolic discounting, meaning that subjects value the near future much more than the distant future (Laibson 1997; Frederick, Loewenstein, and O'Donoghue 2002).

¹¹ A similar approach was used by Holt and Laury (2005) to get around the problem of multiple switch points in a "multiple price list" risk aversion task, whose format is similar to the task used here.

option or always chose the other. Heuristics also generated some modes—for instance, the large spike at 5 corresponds to subjects switching when the 60-day choice moves above \$110—a result similar to that in other studies (notably see Harrison et al. 2002; Fowler and Kam 2006).

Figure 1. Distribution of Patience



Strategic Reasoning

Economic theory distinguishes between choices that are game-theoretic (that is, “strategic”) versus those that are simply decision theoretic. Strategic decisions are characterized by multiple decision makers, each faced with choices whose consequences depend also on the choices made by others. By contrast, decision-theoretic problems may depend on variables that are uncertain but they do not depend on the choices of other decision makers. Obviously, this distinction refers to ideal types, as many decisions combine game-theoretic and decision-theoretic elements. Here we focus on game theoretic choices because they usually require actors to form a clear and accurate picture of other people’s incentives and choices and because many aspects of international cooperation have game theoretic attributes.

Research in behavioral game theory suggests that there is wide variation in how people respond to strategic problems (see Nagel 1995; Stahl and Wilson 1995; Bosch-Domenech et al. 2002; Camerer, Ho, and Chong 2004; Costa-Gomes and Crawford 2006). Some people are unwilling or unable to calculate many moves ahead in a game situation. Others do the opposite—calculating the likely choices by other decision makers and reasoning, move by move, to the fully iterated equilibrium of the game. Previous research in experimental games has found that especially when people initially respond to novel games they do not reason fully to equilibrium (Crawford, Costa-Gomes, and Iriberry 2010). In such novel situations, individuals have not had time to form clear expectations for how others will play the game; instead, they make decisions on their own best move using simple non-equilibrium models of other players (Stahl and Wilson 1995). In such settings most players do not fully model every response and counter-response until they find an equilibrium strategy. Usually they stop after one or two iterations.

This heterogeneity in strategic reasoning could have substantial implications for international cooperation. Many elements thought to be important to the design and operation of international law—such as reciprocity—rely on high levels of iterated, strategic thinking. The decision to ratify and thus be bound by an agreement may depend heavily on whether other states will also join and comply; and whether others will ratify may, in turn, depend on signals they discern from one's own decisions. Nonstrategic decision-makers, who treat the decisions of others as independent, may be less likely to risk joining an agreement because they do not fully consider the benefits from cooperation due to reciprocity. By contrast, those who realize that their own decision to join an agreement will amplify the incentives for other countries to do the same will be more favorable towards joining. In fact, Jervis has pointed out that a key factor underlying uncooperative behavior during the cold war may have stemmed from individual

decision-makers failing to anticipate how others would respond to their own actions (Jervis 1998, 258-60). Thus, our third hypothesis is that we expect people whose behavioral traits include higher levels of strategic reasoning will be more favorable towards joining a treaty.

More strategic actors also may be willing to engage in more complex negotiations because they are better able to fathom the benefits of agreements that involve large numbers of countries and issues. Thus, we also expect subjects whose behavioral traits include deeper levels of strategic reasoning will be inclined toward more complex treaty negotiations—willing to negotiate with more countries whose interests must be represented and whose actions must be predicted.

The game most frequently used to study a subject's depth of reasoning in games is the beauty contest, originally implemented by Nagel (1995). In this game, N players are asked to pick a whole number between 0 and 100 (0 and 100 included). The winner of the game is the player who picks a number closest to the population average multiplied by a number M . If M is less than 1, the unique equilibrium strategy is for all players to guess 0; when M exceeds 1, the unique equilibrium is for all players to guess 100. For example, imagine a version of the game where the multiplier is $2/3$. A player starts with a conjecture that other players choose numbers such that the average is 50. The player should then select 33 as his own choice since this is the closest number to $2/3$'s the group average. Other rational players know this; they, too, choose 33. But if everyone chooses 33, then the original player's best pick is 22 ($2/3$ of 33). At infinite iteration the best choice is zero. To characterizing the number of rounds of strategic reasoning used by subjects we rely on Stahl and Wilson's "Level-K" model. In this model Level-0 players are non strategic; they play a random strategy. Level-1 players are subjects who best respond to average Level-0 play by picking $50 * M$ —a choice that reflects one round of iteration. Level-2

players best respond to Level-1 players by picking $50 \cdot M^2$ —two rounds of iteration—and so forth. While it is possible for players to iterate to an infinite number of levels, most strategies are found to correspond to 1 or 2 steps of iterated reasoning at most (see Nagel 1995; Bosch-Domenech et al. 2002; Camerer 2003; Costa-Gomes and Crawford 2006).

It should be noted that Level-K measurements are not just an assessment of the player's own skill at iteration but also their expectation of what others will do when facing the same choices. If Henry Kissinger thought all other players were mere randomizers then his best choices would be Level-1. Thus, we measure how strategically individuals tend to act, not necessarily their strategic capability. In general, our claims (about the link between level-k traits and international decision-making) do not hinge on whether people behave strategically in light of beliefs or due to individual ability. This is especially true in the two most likely scenarios, where beliefs are either uncorrelated with ability or positively correlated with ability (people think others will play about as strategically as they themselves would).¹²

In order to identify the level of reasoning typically employed by a subject in our study, we followed Corricelli and Nagel (2009) by having each subject play multiple beauty-contest games, each with a different multiplier.¹³ Unlike single games, this approach creates a fingerprint

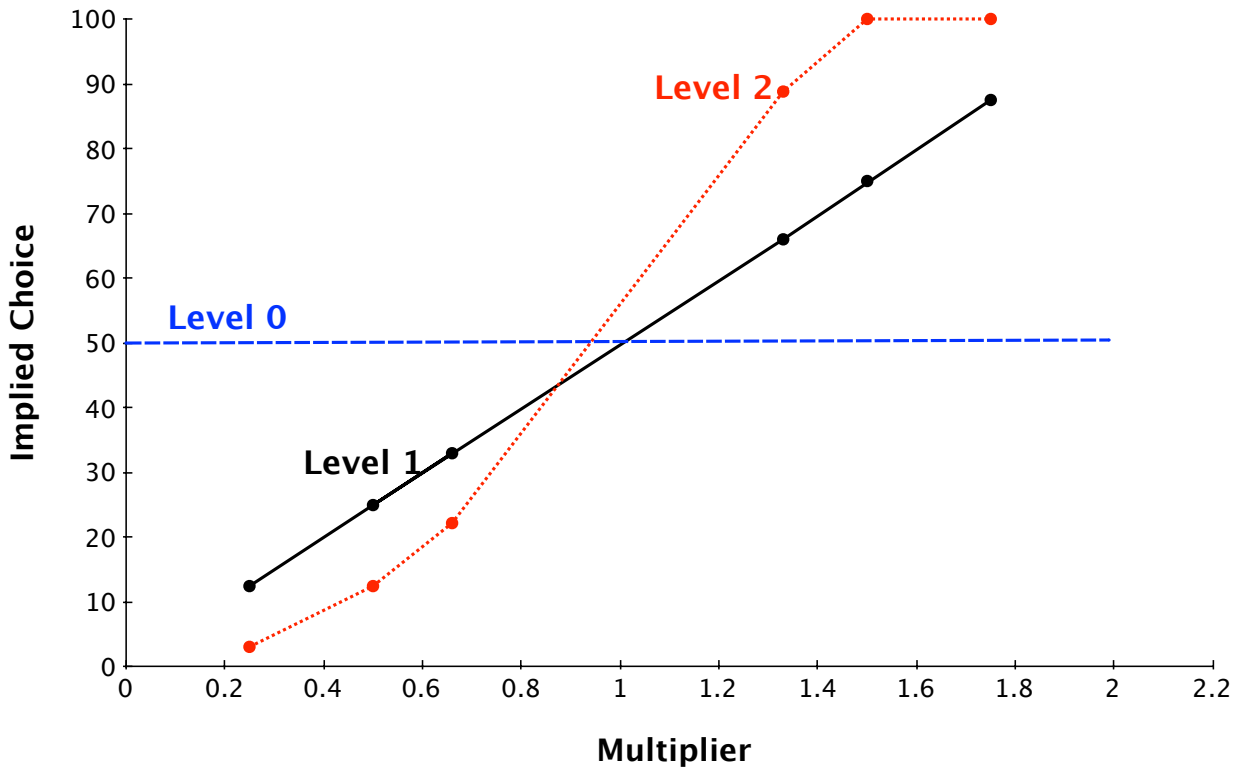
¹² One way our results could be affected is if subjects acted less strategically in our games because they were playing other students, but more strategically in the negotiation decisions because they thought they were (hypothetically) facing more strategic actors. If this were true it would weaken the link between strategic behavior in the beauty contest game and responses to negotiating decisions. Thus, we risk underestimating the link between strategic ability and international decision-making.

¹³ The multipliers we used were $1/4$, $2/3$, $1/2$, $3/2$, $3/4$, $7/4$. The unique equilibrium strategy for all multipliers less than or equal to $1/2$ is 0. For all multipliers greater than $1/2$, the equilibrium strategy is 100.

that better identifies a player's typical depth of reasoning in the game. That is, players with different depths of reasoning create a qualitatively different pattern of choices across the 6 games. Figure 2 shows the patterns of choices that Levels 0, 1 and 2 would make across each of the 6 games. The x-axis is the multiplier used in a game. The y-axis corresponds to the implied choice for each strategic Level of player. As one can see, Level-0 players should consistently play a random strategy across all games, on average choosing 50. Level 1 players best respond to this by multiplying 50 by the game's multiplier, creating a linear strategy profile across games. Level-2 and higher players will exhibit a more s-shaped curve.

Subjects were told that we would pick one game at the end of the academic quarter, and pay the winner of that game \$100.

Figure 2. Strategic Thinkers



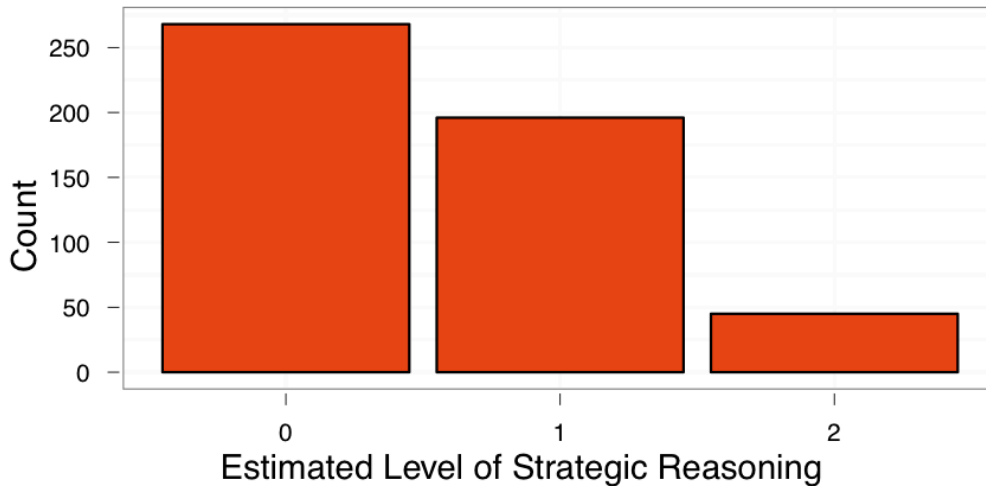
Following Corricelli and Nagel, for every choice in every game we calculated which Level had the lowest squared error. We labeled a player as Level 2 if that player had 4 or more of their 6 choices that were closest to the choice played by an archetypical Level 2 player such as in figure 2.¹⁴ Like Corricelli and Nagel, we do not calculate Levels higher than 2. Thus Level 2 players in our data actually represent “Level 2 or higher”. We labeled a player as a Level 1 if 4 or more of their choices were closest to a Level 1 or greater. We labeled remaining players as a Level-0.

Figure 3 shows the frequency of subjects estimated to be in each category. Most subjects in our study are either categorized as Level-0 players or Level-1 players who engage in one step

¹⁴ Corricelli and Nagel had subjects play 12 games and categorized subjects as Level-2 if more than half of the subjects decision (7 out of the 12) corresponded to a Level-2 or greater player.

of iterated reasoning. A small fraction is categorized as being Level 2 or higher. The relative size of each group is consistent with what Bosch-Domenech et al. (2002) found for experiments in class-rooms and laboratory settings.

Figure 3. Distribution of Level-K Reasoning



While a number of studies have used the Beauty contest game to study strategic reasoning, we believe we are the first to try and connect results in this game to behavior in a separate decision making domain, such as the design and joining of international agreements.

Results

We have suggested that patience and strategic thinking are likely to correspond to preferences for more complexity during the negotiation of an international treaty as well as support for joining a treaty. In the following section, we test these claims, which are summarized in Table 1.

Table 1. Hypotheses

<i>Traits</i>	<i>Preferences For Outcomes</i>	
	Complexity in Bargaining	Joining
Patience	More patient decision makers are more willing to endure complex negotiations in order to reap higher gains.	More patient states will be more willing to join treaties with delayed benefits.
Strategic Skills (Level-K)	More strategic decision-makers are more confident about their ability to successfully navigate complex negotiations, and thus are more willing to engage in them.	More strategic decision-makers are more willing to join cooperative agreements because they understand that their joining affects whether other states will reciprocate.

Negotiation Complexity

In this section we look at how subjects' patience and strategic thinking are related to their preference for negotiating with more countries.

Table 2. Behavioral Traits and Tolerance for Complexity in Negotiations

	<i>Dep. Variable: No. of Countries in Negotiation (4 categories)</i>		
	<i>Patience</i>	<i>Level-K</i>	<i>Both measures + Controls</i>
<i>Patience</i>	0.016*** (0.004)		0.017*** (0.004)
<i>Level 1 Reasoner</i>		0.072 (0.048)	0.043 (0.051)
<i>Level 2 Reasoner</i>		0.281*** (0.099)	0.297*** (0.105)
<i>Female</i>			0.127*** (0.048)
<i>Income</i>			0.006 (0.012)
<i>Year in School</i>			-0.019 (0.019)
<i>Graduate Student</i>			-0.088 (0.091)
<i>Intercept</i>	1.974*** (0.034)	2.030*** (0.035)	1.904*** (0.082)
<i>N</i>	509	509	487†

Standard errors reported beneath each coefficient are White's robust standard errors.

* p<0.1 ** p<0.05 *** p<0.01

†This regression has fewer observations due to some subjects not reporting their family's income.

In Table 2 we report three linear models, each regressing subjects' responses (1-4) onto our measures of behavioral traits.¹⁵ The first set of results regresses subjects' choices on their measured level of patience.¹⁶ The second set regresses subjects' choices on their measured level of strategic thinking, with Level-0 thinkers as the omitted category. The third set reports a regression that includes both measures, plus a number of standard demographic controls

¹⁵ For all regressions reported, we also ran ordered probit models, which relax the assumption that each of the four categories are equally spaced. These models yield substantively similar results and are available from the authors upon request.

¹⁶ This is the number of 60-day choices subjects made in our time discounting task. See the Measurement section for further details.

including the subject's years of post-secondary education (ranging from 1-7), gender (coded 1 for female), family income in the year before they entered college (coded on a scale from 1-9, with each number representing an interval of income¹⁷), and a dummy variable indicating subjects who were in graduate school. The third regression includes fewer subjects because some subjects did not report their family's income.

As expected, both patience and strategic thinking are positively and significantly related to the number of countries a subject decides to invite to the negotiations. Subjects who made more 60-day choices in our time discounting task invited more countries to the negotiations. The most patient subjects chose an average category number that was 0.32 categories higher than the least patient subjects.

Level-2 thinkers, who are particularly strategic, were also more likely to invite more countries compared to both Level-0 thinkers (who act randomly in the beauty-contest game) and Level-1 thinkers (who also act unstrategically, essentially treating other players as essentially a random variable). Level 2 thinkers, by contrast, chose an average category number that was .28 categories higher than Level-0 subjects, and .21 categories higher than Level-1 subjects.

The Decision to Join a Treaty

In this section we report how subjects' willingness to join a negotiated trade agreement depended on an enforcement mechanism as well as subjects' patience and strategic reasoning. The first model in Table 3 reports the effect of enforcement by itself. Subjects randomly assigned

¹⁷ See Section C of the SI for full details.

to the treatment in which the treaty included an enforcement mechanism were about 5% more likely to prefer to join the treaty.¹⁸

Table 3. Decision to Join Trade Agreement

	<i>Dependent Variable: Would Subject Join Treaty?</i>			
	Enforcement	Patience	Level-K	Interactions + Controls
<i>Enforcement</i>	0.244*** (0.089)	0.240** (0.090)	0.239** (0.087)	0.402** (0.164)
<i>Patience</i>		0.008 (0.008)		0.002 (0.013)
<i>Level 1 Reasoner</i>			0.048 (0.092)	0.190 (0.150)
<i>Level 2 Reasoner</i>			0.546*** (0.147)	0.610** (0.247)
<i>Female</i>				-0.016 (0.101)
<i>Income</i>				0.003 (0.021)
<i>Year in School</i>				0.025 (0.031)
<i>Graduate Student</i>				0.268* (0.157)
<i>Enforcement *</i>				-0.340 (0.208)
<i>Patience *</i>				-0.254 (0.323)
<i>Level 1 Enforcement *</i>				2.892 (0.171)
<i>Level 2</i>				
<i>Intercept</i>	3.141*** (0.068)	3.089*** (0.088)	3.077*** (0.074)	2.892*** (0.171)
<i>N</i>	507	507	507	485†

Standard errors reported beneath each coefficient are White's robust standard errors.

* p<0.1 ** p<0.05 *** p<0.01

†This regression has fewer observations due to some subjects not reporting their family's income.

¹⁸ Technically subjects picked 1 of 5 categories for how likely they were to sign the treaty. Each category was stated to represent a 20 point probability interval (0-20%, 21-30% etc). Our regression assumes that movement across the 5 categories is linear. So .244 represents 20*.244 ≈ 5%

The second model reports that patience had no appreciable effect on subject's propensity to join. This result, contrary to our hypothesis, may reflect that joining decisions arise at a single moment in time for which the attributes of the treaty (its costs and benefits as well as its design, such as enforcement) play a much larger role in determining whether individuals favor membership. It may also be, that though the question specified that some benefits would only be realized later in time, it did not specify it for all of the treaties benefits. Thus, while we would expect patience to play a role, the effect may have been diluted by other considerations.

The third model reports that more strategic subjects (those measured to be Level-2 reasoners) were, on average, 11% more likely to join the trade agreement. This is about 2-times the effect of adding enforcement to a trade agreement, and thus suggests that behavioral traits such as strategic thinking can exert a substantial influence on decision-makers' preferences for cooperation relative to the presence of enforcement deemed important by much of the literature. We cannot guarantee that this relative effect size would hold outside the lab. A host of factors (discussed in more detail below) may change it. However, we interpret this effect as evidence that behavioral traits *can* have a relatively large impact on such decisions relative to variables more commonly considered by international relations scholars. It provides a baseline for future research, which might consider how other factors make behavioral traits more or less relevant to actual elite decision-making.

The fourth model in Table 3 shows that these findings are robust to the addition of demographic controls (discussed above). It also shows that behavioral traits do not reliably interact with the presence or absence of an enforcement mechanism. That is, the behavioral traits that we measure have an effect on the decision to join that is largely independent of whether the agreement includes a credible enforcement mechanism.

In addition to collecting quantitative evidence, we also asked subjects to comment on their decisions and reasoning processes, and in Section D of the supplemental information we reproduce some of those comments. Subjects who were classified as nonstrategic (measured as a Level-1 reasoner) typically focused on how their country individually benefited from the treaty's provisions, or acted as though other country's decisions were exogenous. Meanwhile, strategic (Level-2) reasoners were more likely to comment on how their own decision might influence the decisions of other countries.

External Validity

Because laboratory experiments in political science, psychology, and economics often use convenience samples of university students, there is always a question of external validity. This is especially true when we want to make inferences about elite decision makers that are hard to engage in survey and experimental research (Hafner-Burton, Hughes, and Victor 2011). We are thus presented with the question whether we can generalize findings from college students to the individuals who lead nations or who negotiate treaties for a living (for examples of studies that rely on undergraduate populations and seek to make inferences about the behavior of elites, see: Ensley, Marchi, and Munger 2007; Tingley and Walter 2011a, 2011b; Tingley 2011). Of course, college students probably differ from elites in a variety of ways but that their behavior will still be informative. And the findings of the present analysis offer a benchmark for work on different samples and behavioral traits.

To our knowledge, there are no experimental studies of elite political decision makers that measure the behavioral traits of patience; moreover, the literature on elite strategic behavior

is only suggestive.¹⁹ One study has surveyed the existing literature comparing college students to people in the general population across a number of laboratory games (Belot, Duch, and Miller 2010). That study finds that differences tend to be minor and quantitative, not qualitative. That is, the same player traits exist in each population, and are simply distributed differently. The few studies that have focused on behavioral traits in depth find similar results.²⁰ Nonetheless, it is possible that there will be some differences. For example, there may be selection effects that influence which individuals ultimately occupy elite roles. Careers in international law and business typically have long trajectories, and patient people who highly value future success may be disproportionately represented in these careers. And, we might hope, elites that have become leaders charged with the responsibility of brokering and managing international cooperation should be more advanced strategic thinkers.²¹ Similarly, elites gain practical experience on the job, and that experience might affect their choice of heuristics and other mechanisms for decision-making even if they don't affect underlying behavioral traits. Through such mechanisms there may arise differences in the distribution of behavioral traits and related decision-making skills across elite and non-elite populations.

¹⁹ To our knowledge, only three studies have looked at this—none directly focused on elite decision makers relevant for international relations. Camerer (2003, 217), citing an unpublished 1998 Camerer manuscript looks at how undergraduates, trustees at a leading university and CEOs score on level-K studies. See also Plott 1996 and Bosch-Domènech et al. (2002, 1694).

²⁰ For example, Camerer, Ho, and Chong's (2003) data on the beauty contest game played among different sets of individuals (from highly experienced traders to economic Ph.D. students to CEO's) show some differences as well as stable patterns. Even though economic Ph.D. students play strategies that are closer to the equilibrium strategy than general student populations, they also play non-equilibrium strategies, and the pattern of non-equilibrium strategies played is similar to undergrads.

²¹ There is some suggestive evidence that political systems with high levels of accountability—democracies—tend to select leaders with more advanced training (and thus presumably higher levels of patience and possibly greater strategic skills). See Besley and Reynal-Querol 2011; but see also Galasso and Nannicini 2011; and Besley 2005. There is also a growing body of work that looks at characteristics of agents, such as international judges, in international relations and whether they are selected strategically by principles. See Voeten 2008.

To test whether actual policy elites with experience in the field of international trade cooperation (such as the people who have actually negotiated major trade agreements) are differently affected by our treatment or the traits measured in this article, we have developed a sample of elites (n=73). They participated in the identical time-discounting task and beauty-contest game and answered the identical question about whether or not they wanted to join a treaty. The elite sample is comprised of individuals with an average age of 51 and who have an average of 20 years experience in business or government strategy. Like our undergraduate sample, this population is a convenience sample recruited through professional networks. Therefore, we cannot say that this sample's measured traits or question responses are representative of all professionals in the area of international trade and negotiation. However, we can examine how sensitive our findings are to whether individuals come from a convenience sample of undergraduates or from a convenience sample of individuals with relevant experience. Our elite sample is necessarily much smaller than our undergraduate sample because these professionals are much busier than undergraduates, as well as harder to contact. It is therefore more difficult to recruit these individuals in large numbers.

The measured patience and Level-K reasoning of elites in our sample are shown below in figures 4 and 5. As one might expect, elites differ from undergraduates. Figure 4 shows a distribution that is, on average, more patient than undergraduates. This difference is statistically significant (Wilcoxon rank sum test p-value = 1.8×10^{-6}). Figure 5 shows that elites in our sample also display a higher level of strategic reasoning, with more individuals categorized as Level 1 and 2, and many fewer categorized as Level-0 reasoners (Wilcoxon rank sum test p-value = 4.94×10^{-6}). However, it is important to note that despite these differences there is still substantial overlap in both distributions. Furthermore, as we show below, differences in the

distribution of traits may not substantially change the relationship between those traits and the preferences that individuals have for treaties.

Figure 4. Distribution of Elite Patience

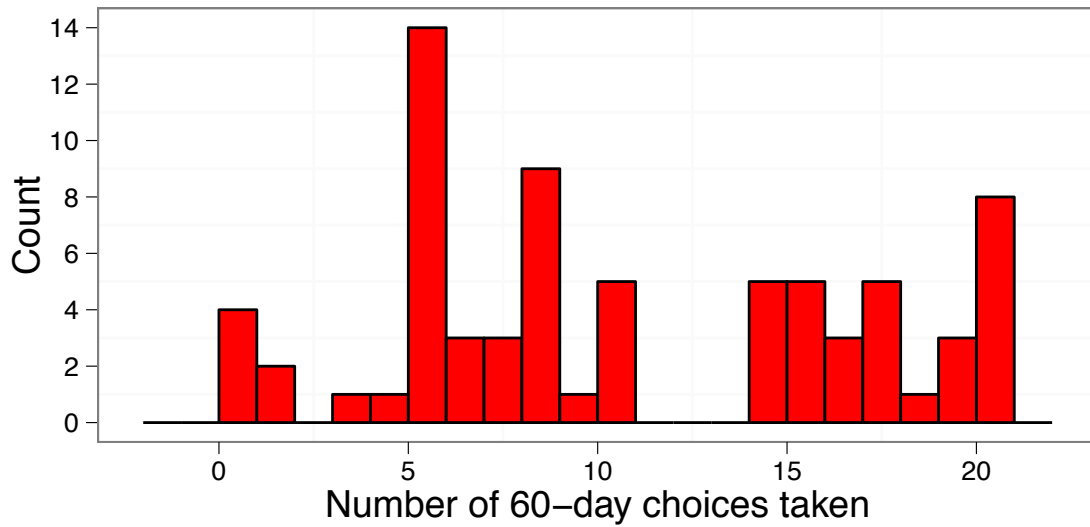


Figure 5. Distribution of Elite Level-K Reasoning

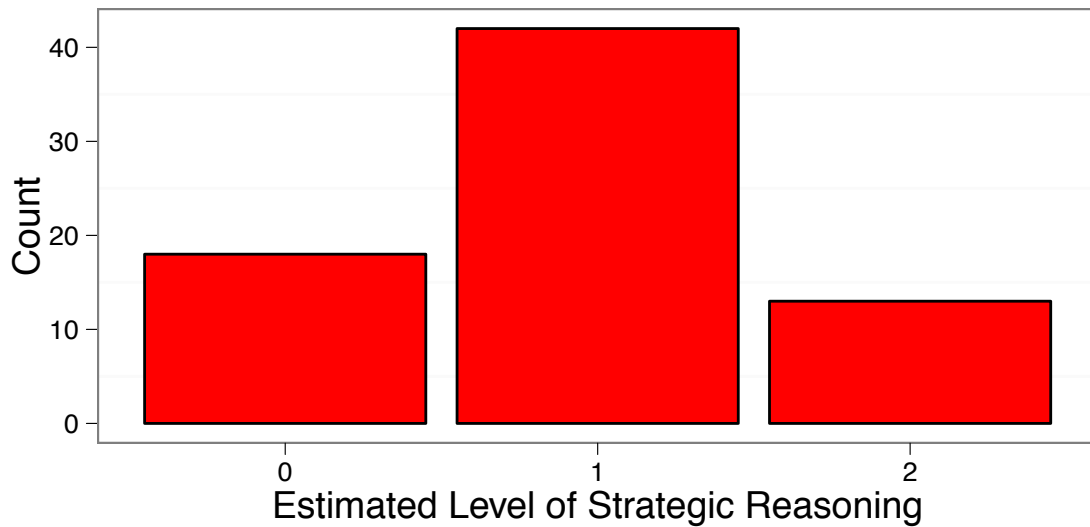


Table 4 displays results similar to that of Table 3, pooling both undergraduate and elite responses to our question of whether or not to join a trade agreement. In the first 3 columns we

look for whether there is an interaction between an individual's elite status and our treatment (column 1), their level of patience (column2), or their Level-K reasoning (column3). Column 4 includes all three interaction terms.

The results in Table 4 point in the same direction as the undergraduate-only sample in Table 3. Patience does not affect an individuals' decision to join the treaty, and there is not a significant interaction between patience and being an elite. Likewise, Level- 2 reasoners are still more likely to join the treaty, and there is not a significant interaction between this effect and elite status. Thus, at least within our sample, we cannot reject the hypothesis that traits affect elites' preferences for treaties in the same manner as undergraduates.

Table 4. Decision to Join Trade Agreement Pooling Elite and Undergraduate Samples

	<i>Dependent Variable: Would Subject Join Treaty?</i>			
	Enforcement	Patience	Level-K	All interactions
<i>Enforcement</i>	0.244** (0.090)	0.240** (0.084)	0.226** (0.083)	0.236** (0.089)
<i>Patience</i>		0.008 (0.008)		0.004 (0.008)
<i>Level 1 Reasoner</i>			0.047 (0.094)	0.040 (0.095)
<i>Level 2 Reasoner</i>			0.546*** (0.161)	0.533** (0.162)
<i>Elite</i>	0.375** (0.126)	0.367 (0.24)	0.304 (0.243)	0.409 (0.320)
<i>Elite × Enforcement</i>	-0.15 (0.23)			-0.104 (0.258)
<i>Elite × Patience</i>		-0.002 (0.022)		-0.008 (0.022)
<i>Elite × Level 1</i>			0.051 (0.296)	0.061 (0.309)
<i>Elite × Level 2</i>			-0.090 (0.397)	-0.033 (0.428)
<i>Intercept</i>	3.140*** (0.068)	3.092*** (0.088)	3.083*** (0.074)	3.050*** (0.090)
<i>N</i>	580	580	580	580

Standard errors reported beneath each coefficient are White's robust standard errors.

* p<0.1 ** p<0.05 *** p<0.01

Implications

Facing the same situation and placed in the same decision making role, people's behavioral traits reliably correspond to differences in their views on international cooperation, specifically their willingness to take on complex bargaining and seek participation in treaties. If these characteristics hold in actual policy decision-making forums then there could be large implications for the study of international relations. We close by looking at three.

First, and most centrally, the content of international agreements may have a lot to do with the people involved—who negotiates a treaty, for example, could have an impact on which countries are included, and who votes on membership could affect participation. These effects are distinct from the situations decision makers face, their professional roles and the structure of the bargaining situation. Already, studies in international relations reflect on what happens if states are more or less patient.²² Our study builds on this literature by suggesting that whether or not a state acts patiently might depend in part on the patience of the individuals making the key decisions about cooperation. On the other hand, no studies that we are aware of allow decision makers in international relations to be heterogeneous in their ability to reason strategically. We've shown that this ability does in fact vary among undergraduates and that these variations correlate to different preferences for particular kinds of international cooperation.

²² This interest in patience is anchored in the insight that the length of future shadows matters and that one key function of international institutions is to lengthen that shadow. See, for example, Axelrod and Keohane 1985; and Martin 1995.

If this holds then the core theories in international relations—which have focused on international structure and institutional attributes such as enforcement—are indeed missing a key part of the explanation for preferences for international cooperation, which may be especially valuable in identifying why cooperation processes are, in reality, often far from rationally optimal or functional to the strategic problem at hand. We have suggested in this article that these behavioral traits could have an influence on preferences that is equal to or larger than other factors that have attracted intense scholarly attention, such as enforcement of agreements.

Second, work of this type might help shed light on principal-agent (P-A) relationships in international relations. In the tradition of P-A frameworks, it is assumed that when there is slack between the underlying principal and the agent that the latter pursues his own interests—seeking to gain privately at the expense of serving the principal’s goals (see chapter 12 by David Lake and Mathew McCubbins in Hawkins et al. 2006). While that behavior may be important in some settings, the work here suggests agency slack might operate in other ways as well. If agents are free (within the constraints of their negotiating instructions, for example) to make strategic choices then those choices might reflect behavioral traits (along with other factors like experience) that guide how the agent thinks policy decisions might best be addressed. At critical junctions in negotiations—when there are a few agents in the room and where the outcomes reflect in large measure their judgment—these factors could prove to be very important and also amenable to systematic study.

Third, this work suggests an agenda for research that links the revolution in methods and insights from behavioral economics and cognitive psychology to the study of international relations, including institutions. A full description of that agenda is beyond this article, but one promising direction suggested by our research is the potential for using convenience samples to

study at least some of these phenomena. More work is needed to understand when convenience samples will adequately reflect real-world decision-making—our article suggests that the traits and substantive questions we have studied are one area where convenience samples may be appropriate. But where those convenience samples are appropriate this could be a boon to IR scholars seeking to marry the methods of experimental research, the insights from the cognitive revolution in the social sciences, and the practical questions that govern the international behavior of nations.

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Supporting Information

In Section A of the Supporting information we present the instructions given to subjects for the Time Discounting Task, used to measure patience, as well as the instructions for the Beauty-Contest games used to measure strategic reasoning.

In Section B we present the two survey questions used to measure subjects willingness to negotiate under greater levels of complexity, as well as their willingness to join a cooperative trade agreement.

In Section C we present the demographic survey questions used in the article's regressions.

In Section D we present some of the comments subjects made with regards to whether or not they wanted to join the treaty.

Section A: Game Instructions

A1. Time Discounting Task

For this next section of the study, we will draw a monetary prize. If you are chosen to win the prize your choices below will determine the amount of the prize and the date of payment.

You will be asked to choose the payment option that you would prefer in each of 20 different payoff alternatives.

Note that for each of the 20 payoff alternatives Option A will pay \$100 in 30 days and Option B will pay \$100 + \$x in 60 days.

For each payoff alternative you will select the payment option (A or B) that you would prefer if you are chosen to receive the prize.

When the study is completed a random drawing will be held to choose which one of the 20 payoff alternatives will determine the prize, and another random drawing will be held to determine the one person who will receive the prize.

When and how much the winner will be paid will be based on the payment option he or she chooses under the payoff alternative selected.

Please make a choice for each payoff alternative below.

	A (1)	B (2)
Option A (\$100.00 in 30 days) or Option B (\$100.17 in 60 days)? (1)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$100.25 in 60 days)? (2)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$100.33 in 60 days)? (3)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$100.42 in 60 days)? (4)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$100.63 in 60 days)? (5)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$100.84 in 60 days)? (6)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$101.05 in 60 days)? (7)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$101.26 in 60 days)? (8)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$101.47 in 60 days)? (9)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$101.68 in 60 days)? (10)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$102.10 in 60 days)? (11)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$102.96 in 60 days)? (12)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$104.25 in 60 days)? (13)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$106.44 in 60 days)? (14)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30	<input type="radio"/>	<input type="radio"/>

days) or Option B (\$108.68 in 60 days)? (15)		
Option A (\$100.00 in 30 days) or Option B (\$110.96 in 60 days)? (16)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$113.29 in 60 days)? (17)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$115.66 in 60 days)? (18)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$118.08 in 60 days)? (19)	<input type="radio"/>	<input type="radio"/>
Option A (\$100.00 in 30 days) or Option B (\$123.07 in 60 days)? (20)	<input type="radio"/>	<input type="radio"/>

A2.Beauty Contest Game

For the next section we will draw a \$100 prize at the end of the study. Whether or not you win this prize will depend both on your choices and the choices of other study participants.

You have been paired randomly with 5 other anonymous participants in the study. You will never know their identity, and they will never know yours.

In this section, you will play 6 games. In each game you and each of the participants that you have been paired with will guess a whole number (integer) between 0 and 100 (0 and 100 included).

The winner of this game will be the participant in the group whose guess is closest to the group’s average guess, multiplied by a number M. We tell you what M is at the beginning of each game.

If more than one participant picks the same winning number, we will split the prize among those participants.

At the end of the study we will choose 1 group via a random drawing. We will then, via another random drawing, pick 1 of the group's games. For the chosen game and group, the winner will be awarded \$100 and notified by email.

What is the average?

The average is the sum of each participant's guess divided by the number of participants. So if the 5 participants in a group each guess numbers a, b, c, d, e. The average is $(a+b+c+d+e)/5$.

Calculator

This game isn't supposed to be a math test. Feel free to use a calculator. We've provided a link to one below each game.

Examples

Example1:

Say the multiplier M is 3/5. The winner of this game is the participant whose guess is closest to the group's average guess multiplied by 3/5. Below is a table showing 3 possible average guesses for a group, and the optimal guess given that average guess. The winner of the game would be the participant whose guess was closest to the optimal number.

For $M=3/5$

If the group's average guess is	75	50	25
The winner is the participant in the group who guessed the number closest to	45	30	15

Example2:

Say the multiplier M is 6/5. Below is a table showing 3 possible average numbers for a group, and the optimal guess.

For $M=6/5$

If the group's average guess is	75	50	25
The winner is the participant in the group who guessed the number closest to	90	60	30

Notice how when the Multiplier M is less than 1 (Example 1) a player always wants to guess lower than the group average, and when the Multiplier M is greater than 1 (Example 2) a player always want to guess above the group average.

<After reading the instructions above, subjects played each of the following 6 games in random order. For each game they had access to a calculator.>

Game M=1/4

Please use the slider to pick a number between 0 and 100 (0 and 100 included). The winner of this game will be the participant whose guess is closest to the group's average guess, multiplied by 1/4.

Game M=1/2

Please use the slider to pick a number between 0 and 100 (0 and 100 included). The winner of this game will be the participant whose guess is closest to the group's average guess, multiplied by 1/2.

Game M=2/3

Please use the slider to pick a number between 0 and 100 (0 and 100 included). The winner of this game will be the participant whose guess is closest to the group's average guess, multiplied by 2/3.

Game M=4/3

Please use the slider to pick a number between 0 and 100 (0 and 100 included). The winner of this game will be the participant whose guess is closest to the group's average guess, multiplied by 4/3.

Game M=3/2

Please use the slider to pick a number between 0 and 100 (0 and 100 included). The winner of this game will be the participant whose guess is closest to the group's average guess, multiplied by 3/2.

Game M=7/4

Please use the slider to pick a number between 0 and 100 (0 and 100 included). The winner of this game will be the participant whose guess is closest to the group's average guess, multiplied by 7/4.

Section B***B1. Question on Negotiation complexity***

You are the lead negotiator on behalf of your government for a major new treaty on international trade. The treaty would contain obligations that require signatories to lower tariffs and other barriers against trade with other countries that join the treaty. If you succeed in negotiating the treaty, your country's economic output could increase by a few percent in a decade, creating new jobs. Furthermore, in the future, the larger international markets created by the treaty may also create opportunities for local companies to sell profitable new products and services around the world. However, in the immediate term not everyone in your country will benefit if you join the treaty; some existing jobs could be lost, leaving some people unemployed.

Currently you are deciding how many countries should be invited to the first round of negotiations. Ideally, the treaty would include a large number of countries that all adhere to the treaty obligations. However, there is a trade off. At one extreme, you can start negotiations with all of the 160 countries that could be treaty members, but the risk is that such a negotiation would be extremely complicated and reaching agreement would require watering down the obligations for each country. Possibly

over time those obligations could be strengthened through future negotiations. At the other extreme, you can start negotiations with just a few countries, accounting for a substantial fraction of international trade, and guarantee the treaty contains essentially all of the obligations you want. However, the risk is that you will reach an agreement that will anger countries left out of the negotiations, and those countries' markets will become less accessible to trade now and in the future. While these countries comprise a small share of the market now, many of these country's markets are likely to grow over time. Possibly over time through future negotiations some of these other countries could be included.

Indicate your top preference for your negotiating strategy.

- Start with a very small number of countries that account for 1/3rd of world trade and are likely to accept 100% of the treaty obligations, but only for that very small group (1)
- Start with a couple dozen countries that account for 1/2 of world trade and are likely to accept 75% of the treaty obligations that you are seeking, but only for those couple dozen countries (2)
- Start with about 100 countries that account for the majority of world trade and accept 50% of the treaty obligations that you are seeking, but only for those 100 countries (3)
- Start with all 160 countries that account for essentially all world trade are likely to accept perhaps 25% of the treaty obligations that you are seeking (4)

B2.Question on Joining: No Enforcement condition

You are deciding on behalf of the government whether to join a major new treaty on international trade. The treaty contains obligations that require signatories to lower tariffs and other barriers against trade with other countries that also join the treaty. If you join the treaty, your country's economic output could increase by a few percent in a decade, creating new jobs. Furthermore, in the future, the larger international markets created by the treaty may also create opportunities for local companies to sell profitable new products and services around the world. However, in the immediate term not everyone in your country will benefit if you join the treaty; some existing jobs could be lost, leaving some people unemployed. You will benefit more if many other countries join the treaty than if only a few join the treaty, as long as most countries comply with the agreement. **The treaty does not provide any formal mechanism to punish countries that fail to comply.**

What is the percent chance that you will join this treaty?

- 0-20% Highly unlikely (1)
- 21-40% Fairly unlikely (2)
- 41- 60% Could go either way (3)
- 61-80% Fairly likely (4)
- 81-100% Almost certain (5)

B3.Question on Joining: Enforcement condition

You are deciding on behalf of the government whether to join a major new treaty on international trade. The treaty contains obligations that require signatories to lower tariffs and other barriers against trade with other countries that also join the treaty. If you join the treaty, your country's economic output could increase by a few percent in a decade, creating new jobs. Furthermore, in the future, the larger international markets created by the treaty may also create opportunities for local companies to sell profitable new products and services around the world. However, in the immediate term not everyone in your country will benefit if you join the treaty; some existing jobs could be lost, leaving some people unemployed. You will benefit more if many other countries join the treaty than if only a few join the treaty, as long as most countries comply with the agreement. **An independent enforcement mechanism promptly and credibly punishes any country that does not comply by taking away some of the benefits of the treaty from the country that breaks the rules.**

What is the percent chance that you will join this treaty?

- 0-20% Highly unlikely (1)
- 21-40% Fairly unlikely (2)
- 41- 60% Could go either way (3)
- 61-80% Fairly likely (4)
- 81-100% Almost certain (5)

Section C: Demographics

C1.Gender

Are you male or female?

- Male (0)
- Female (1)

C2.Income

For this question, please take your best guess even if you do not know the exact answer. Please choose the total income earned by the adults in your household in the year before you entered college.

- \$0-\$24,000 (1)
- \$25,000-40,000 (2)
- \$41,000-54,000 (3)
- \$55,000 - \$69,000 (4)
- \$70,000 - \$84,000 (5)
- \$85,000 - \$99,000 (6)
- \$100,000 - \$149,000 (7)
- \$150,000 - \$199,000 (8)
- \$200,000 or more (9)
- Don't know (10)

C3.Year in school

What is your year in at UCSD?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- Graduate Student (7)
- Other (8) _____

In addition to the demographics listed above we also looked at partisanship and ideology. An early reader of this paper suggested including a control for subjects' general preference for free trade or the intensity of their trade preferences.

Unfortunately we do not have such a control. Furthermore, including such a control could be problematic because general trade preferences could easily be the product of the two traits we are measuring and effectively constitute a "post-treatment" variable. For a brief explanation of why post-treatment variables are a problem for regression inference see King and Langche 2005. Though we cannot control for such a factor, we believe this is unlikely to affect our results for two main reasons.

Theoretically, it seems unlikely that a preference for free trade causes an individual to be more patient or strategic. Empirically, there is little correlation between the games we use and proxies for trade preferences such as ideology (which we measured using a standard 7 point Likert scale where 1 represents "extremely liberal" and 7 represents "extremely conservative"). The Pearson correlation between this measure and a subject's Level-K is -.06. The correlation between ideology and patience is even lower at 0.02.

Section D: Subject Comments on the Question of Joining a Trade Treaty.

As noted in the main text of our article, we also invited subjects to comment on their decisions and reasoning processes regarding their decision about whether or not to join a trade agreement. Subjects who were classified as nonstrategic (measured as a Level-1 reasoner) typically focused on how their country individually benefited from the treaty's provisions, or acted as though other country's decisions were exogenous:

“By lowering tariffs and other barriers against trade with other countries my country's economic output could increase. Although not everyone will benefit, there is a 50/50 chance of benefiting depending on the amount of countries joining the treaty, therefore I could go either way.”

“The long-term effects do not seem promising - the success of your country is based on others' decisions.”

Meanwhile, strategic (Level-2) reasoners were more likely to comment on how their own decision might influence the decisions of other countries:

“The long term gain outweighs the short term pain. The assumption is that I'm making a decision for the US government. Because we will benefit more by more people joining and the US is looked to as an example in many regards.”

“The more countries that join the better it is for all of them. So by joining, you encourage others to do the same, presumably.”