

# Leader Age, Regime Type, and Violent International Relations

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In this article, the authors investigate the relationship between states' political leaders' ages, their regime type, and the likelihood of militarized dispute initiation and escalation. They examine more than 100,000 interstate dyads between 1875 and 2002 to systematically test the relationship between leader age and militarized disputes. The results show that, in general, as the age of leaders increases, they become more likely to both initiate and escalate militarized disputes. In addition, the interaction of age and regime type is significant. In personalist regimes, the general effect reverses; as age increases, the relative risk of conflict declines in comparison to other types of regimes. Increasing leader age in democracies increases the relative risk propensity for conflict initiation at a higher level than for personalist regimes, while the impact of increasing leader age is most substantial in intermediate regimes.

***Keywords:*** *leaders; age; war; psychology; quantitative*

Is there a relationship between the age of a nation-state's leader and his or her propensity to adopt a violent foreign policy or to initiate war? Conventional wisdom holds that younger men tend to be brash and bold, while older men tend toward caution and judiciousness. Yet many wars in history are the result of the policy choices of older men. Are callow youth relatively more belligerent, or do men become more risk acceptant once they are old enough to no longer have to face the physical risks of combat themselves? If these differences exist, what drives them?

In this article, we investigate the interrelationships between the age of state leaders, regime type, and the likelihood of militarized dispute initiation and escalation. We

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examine more than 100,000 interstate dyads between 1875 and 2002 in an attempt to test systematically for a possible relationship between leaders' age and the likelihood of observing militarized interstate disputes. Our results show that as the age of leaders increases, they generally become more likely to both initiate and escalate militarized disputes. In addition, the interaction of age and regime type is also significant, leading to different results for certain types of dictators. In personalist autocratic regimes, the general result reverses. In these cases, as the leader's age increases, the relative risk of conflict declines relative to the rising risk of conflict associated with aging leaders in other types of regimes, including democracies. The associated increases in violence with increasing leader age are smaller in democracies than in intermediate or oligarchic regimes.

## INDIVIDUAL LEADERSHIP AND MILITARIZED DISPUTES

For decades, international relations theorists have focused much of their analytic efforts on the systemic and state-level factors that influence the probability of interstate conflict. Waltz's (1959) *Man, the State, and War* split the presumed factors that influence international politics into three images: the individual, the state, and the international system levels. In Waltz's view, the first image is that of the statesperson, whose decisions are the proximate cause of the events that drive international politics. The second image is that of the nation-state, with factors internal to the state, such as regime type and ideology affecting international interactions. The third image, the one privileged by Waltz and neorealists or structuralists, portrays systemic factors such as the international balance of power and economic interactions as the most important explanatory attributes of the international system. In this article, we examine the influence of one facet of the first image, the political leader's age, and another facet of the second image, regime type, on the initiation and escalation of interstate conflict.

There has been a long discussion in the personality and social psychology literature documenting the difficulty of both determining and predicting personality characteristics or traits and their associated effects on public policy. Most of this research demonstrates that most people display remarkable inconsistency in behavior across varied situations. Few significant associations stand out in the quantitative literature on the cross-sectional relationship between personality types and policy formation. Studies that focus on the behavior of individuals over time seem to demonstrate somewhat more consistent results but only within relatively restricted characterizations of prosocial, aggressive, or withdrawn personality types (Allen and Bem 1974; Bem and Funder 1978; Epstein 1979; Mischel and Peake 1982; Funder and Colvin 1991). Perhaps the greatest challenge this line of research faces is the inherently wide variation in personality types within the human population. As a result, in part, it is difficult to predict successfully behavior based on personality type. Nevertheless, the enterprise continues (Byman and Pollack 2001, 112).

Actually testing first-image variables to determine if they have a systematic influence in international affairs serves an important role within the international relations literature for two reasons. First, given the relative paucity of individual-level variables

in much of the mainstream quantitative international relations research, conducting systematic tests of individual-level variables will make an important contribution to international relations theory. Second, advances in neuron-psychology research point to relatively predictable biological mechanisms influencing human behavior (Rosen 2005). While recent studies do not claim that behavior is biologically determined, they do demonstrate that variation in individual neural characteristics plays an important role in influencing the way individuals respond to various environmental stimuli. There is no reason to believe that national leaders are excluded from the psychological insights applied to individuals in general (Ridley 2003; Over 2003).

In the political psychology literature, there is a well-developed body of research on the ways that individual leaders influence international politics. Hermann et al. (2001) review some of this work, arguing that leadership style is one of the fundamental determinates of a state's foreign policy (see also Hermann and Hagan 1998; Hermann and Kegley 1995; Hermann 1984, 1988). According to Hermann and others, variance in leaders' personality structure is likely to affect how leaders use their political influence in distinct ways, especially in the realm of foreign policy. This generation of political psychology research typically provides typologies, or ideal types, within which leaders fit. One common category used to separate leaders is whether they seem to be more ideological or more pragmatic in their approach to challenges. Another way to divide leaders is to compare those who are goal driven with those who seem more responsive or reactive to the events around them.[1] Hermann et al. (2001) view several factors as critical when cataloging individual leaders: responsiveness to constraints, openness to new information, and solving problems versus developing relationships (p. 95). Examples of situations in which the personality of individual leaders may have played a decisive role in driving international conflict include President Lyndon Johnson's actions concerning the U.S. escalation of the war in Vietnam in 1965 and President George H. W. Bush's response to the Iraqi invasion of Kuwait in 1990 (Herman et al. 2001).

Other literature focuses on cognitive belief systems and their influence on politics. Post (2003) recently edited a volume focusing on individual leaders, including a psychological profile of Saddam Hussein. Tetlock (Tetlock 1991, 1992, 1999; Levi and Tetlock 1980) has written extensively about cognitive belief systems and their impact on politics. He argues that the literature on errors in judgment and cognitive bias demonstrates that, once formed, belief systems are very difficult to change (Tetlock 1999, 363-4). A variety of psychological defensive mechanisms prevents people from updating their beliefs in consistent fashion. This can happen when they adopt new theoretical prior beliefs, enabling them to generate explanations designed to ensure cognitive consistency rather than a coherent set of posterior beliefs given their earlier priors and events that would otherwise create cognitive dissonance. This argument is in some ways similar to the analogical reasoning claims made by Khong (1992), who states that key historical events form paths of logical reasoning in the minds of deci-

1. This characteristic can be seen as similar to Barber's (1992) notion of active versus passive forms of leadership.

sion makers, causing them to view future events through the lens of past formative experiences.

Goldstein (2001) provides an important challenge to the idea that human biology accounts for much of the variation across an individual decision maker's policy choices. Goldstein studies the relationship between gender and war, reviewing available historical literature on women warriors, academic literature on biological differences between the sexes, and group psychology, as well as recent examples of the interaction of gender and beliefs about armed conflict. He concludes that biologically deterministic theories undervalue the strong role of society in socially constructing gender roles from a very young age. Instead of gendered differences displayed in warfare resulting from built-in neural "hardwiring," Goldstein argues that "the socialization of children into gender roles helps reproduce the war system" (Goldstein 2001, 6).

In contrast to Goldstein's (2001) work, Rosen's (2005) recent discussion of the relationship between neurobiology and strategic decision making by national leaders highlights the importance of genetic factors without explaining them in a deterministic fashion. Rosen argues that advances in evolutionary biology, verified by laboratory experiments, allow scholars who study individual behavior to understand with greater accuracy the inputs that drive decision making. Rosen uses a series of illustrative case studies to demonstrate how variance in various psychological factors interacts with traditional state- and system-level variables to influence international politics. For example, while many decision makers claim ex post to have evaluated all relevant information before making decisions (and may even have attempted to do so), cognitive pattern recognition based on historical experience makes such an effort difficult to accomplish. Neurobiology research suggests that a person's emotional response is often more important than the "rational" or cognitive response (Rosen 2005). While Rosen's work is largely descriptive, it suggests that future quantitative tests of dispute behavior should include operational indicators of individual leaders' psychological characteristics to advance the more general debates about the causes of war and peace.

One place to begin such a theory-building and testing exercise of first-image variables is by studying the effects of leader age on state behavior. The importance of age as a factor influencing the behavior of leaders is a commonly held belief among nonacademic audiences. For example, descriptions of the younger Bill Clinton as "dashing" versus the older George H. W. Bush as "experienced" in the 1992 U.S. presidential campaign, as well as the way the media played up the so-called generation gap between them, illustrate the way in which the importance of age has filtered into the popular consciousness. The popular media tend to portray younger leaders as energetic and older leaders as experienced. One important historical example related to international conflict involves Louis XIV of France. Louis XIV is an example of a leader who, at the presumably impetuous age of twenty-nine, made a questionable decision to use complicated succession claims as the legal basis for France's attacks on Spanish assets in the War of Devolution in 1667-1668. Alexander the Great, another young, bold, and risk-acceptant leader, assembled the then world's largest empire before his unexpected death at age thirty-three.

A review of the literature on age and behavior demonstrates how factors such as testosterone and individual time horizons may interact with the age of leaders to produce

behavioral traits amenable to statistical testing. While we do not mean to claim that age is the only, or even the most important, individual-level variable that influences the behavior of leaders, it is clearly a meaningful variable in that all leaders age, while not all states experience democracy, for example. Examining this factor further may also provide a baseline for future systematic studies of leadership attributes and foreign policy decisions.

## AGE AND TESTOSTERONE

One important biological factor affecting human behavior that varies with age is the hormone testosterone. Testosterone is present in both men and women, although levels in men generally exceed those in women by a factor of about ten. Commonly thought of as exclusively a sex-related hormone, testosterone affects the entire body, exerting its influence on functions as diverse as the musculoskeletal system, brain, blood, and skin (Dabbs 2000). Testosterone produces several distinct effects on the human body. As a result of higher levels of testosterone than found in women, men build more lean muscle mass, more body mass (especially in their upper bodies), and more red blood cells to carry oxygen than women have. Testosterone also predisposes men toward building fat around their stomach, the so-called apple shape, a form of energy storage more easily burned off in the case of threats to subsistence. In contrast, women's higher estrogen levels give them stronger immune systems. Women tend to gain weight around the hips, producing a pear shape that resists usage unless necessary during pregnancy and breastfeeding (Daly and Wilson 1978).

More than 40 percent of the variance in individual levels of testosterone is hereditary (Meikle et al. 1988). This finding is consistent with the adage "like father, like son." Testosterone also tends to be relatively stable over time in individuals. However, it does vary with a predictable circadian rhythm, such that individuals' hormone levels are highest in the mornings in both men and women (Dai et al. 1981). There are also predictable seasonal variations in testosterone levels. It appears to be highest in late fall and early winter and lowest in late spring and early summer (Dabbs 1990). This influences the timing of the seasonal peak for births in August and September—nine months after testosterone levels in men reach their seasonal apex (Randall 1987).

Testosterone levels also slowly, but predictably, decline over time, especially in men. Testosterone increases greatly around the time of puberty. In men, such levels peak in the mid-twenties and then begin a slow, steady decline over the rest of their lives. For example, in one large study of 526 men, the average serum testosterone level for men between the ages of twenty and twenty-nine was 3.1 ng/ml, while the average level for men older than age seventy was 1.7 ng/ml. Testosterone levels declined twice as fast in men who were relatively less healthy (Schatzl et al. 2003). Other studies indicate that the mean level of plasma testosterone in men older than age seventy-five is about 35 percent less than that found in younger men (Seidman 2003). Total testosterone levels appear to drop at a maximal rate of 1.6 percent per year, starting in the mid-twenties (Juul and Skakkebaek 2002). However, there do appear to be some differences in average testosterone levels among different populations. Peter Ellison and

colleagues (1998) tested relative levels over the life span in men from the United States, Congo, Nepal, and Paraguay. The men in the United States (Boston) began with the highest levels of all four groups and demonstrated the most precipitous drop over time, leaving these men with the lowest mean levels by old age. The one notable exception to these findings is that male testosterone drops significantly in the years surrounding marriage and fatherhood and increases sharply in the years surrounding divorce, perhaps accounting for variation in domestic abuse around this time (Booth and Dabbs 1993; Mazur and Michalek 1998; Wilson and Daly 1993). It is noteworthy that around middle age, men and women become more alike. Women become menopausal, thereby raising their relative testosterone levels as their estrogen plummets.

Why should an age-related drop in testosterone matter? In addition to testosterone's well-understood effects on men's physical characteristics, it is also implicated in studies of human aggression. As men age and their testosterone drops, they tend to become less aggressive, less likely to engage in dominance behaviors, and less likely to favor risky choices.

However, the causal links between the association among age, testosterone, and behavior are not well understood however. Many studies have found that the relationship between testosterone levels and aggression for humans is far from clear. Archer's (1991) review of the work on testosterone and aggression concluded that the evidence demonstrating the importance of testosterone was far from decisive. A more recent meta-analysis of previous work on the relationship between testosterone and aggression finds that difficulties in the measurement of testosterone have seriously complicated previous research. Moreover, adaptation to particular environments, sex, and other factors may constrain the relative importance of testosterone levels (Book, Starzyk, and Quinsey 2001, 579-84).

Goldstein (2001) presents an important counterargument that challenges the standard view linking testosterone and aggressive behaviors. Goldstein argues that blaming testosterone for the aggressive behavior of males ignores the way gender roles are socially constructed in society from birth, producing cues that cause status seekers of both genders to behave in particular ways. He believes that the substantial variation in an individual's testosterone levels during the day, in response to particular situations, and over time suggests that testosterone is not a significant explanatory factor in comparison with the context in which decisions are made (Goldstein 2001, 156-7).

Goldstein's (2001) work is consistent with Alice Eagly's (1987) meta-analysis of psychological studies of sex differences in social behavior. She argues that boys and girls are socialized into different roles from birth and that social expectations and parenting reinforce these roles in ways that lead to a sex-based division of labor. She argues that such socialization results in sex-specific skills and beliefs, which in turn lead to divergent behavior. She suggests that social role theory offers a better explanation for sex differences in social behavior than explanations grounded in human physiology.

Goldstein's (2001) work provides an important jumping-off point for our research for a few reasons. First, although his main argument focuses on the powerful role of socialization, he notes that testosterone likely plays some role in influencing aggres-

sive behavior. Second, while he views behaviors strongly linked to testosterone, such as status-seeking and dominance behavior, as potentially irrelevant to the study of international politics, those are precisely the personality characteristics likely to be found in more aggressive leaders or to trigger aggressive behavior in leaders. In international politics, status-seeking and dominating behavior may be as important as raw aggression in affecting the likelihood of international conflict. Third, while Goldstein and others have generally conducted more descriptive and qualitative tests of biological factors such as testosterone, the analysis in this study can begin the task of systematically testing the insights of scholars such as Goldstein by using a leader's age as a proxy.

Given that younger men have more testosterone than older men do, we can begin to test a theory relating testosterone levels to aggression by generalizing to the behavior of national leaders. Traditional international relations theory, as explained above, predicts that the impact of testosterone and aging is likely irrelevant in light of the overwhelming importance of systemic factors such as the international balance of power. In addition, the meta-analyses cited above suggest that the role of testosterone is far from conclusive. Thus, the null hypothesis is that these traditional theories are correct and/or testosterone does not matter in expressing aggression, meaning that there should be no relationship between the age of leaders and the probability of dispute initiation and escalation.

*Hypothesis 1:* Age is unrelated to the outbreak and escalation of militarized disputes.

In contrast, given the large body of literature demonstrating the relationship between testosterone and aggression, we hypothesize the following:

*Hypothesis 2:* Younger leaders will be more likely to initiate and escalate militarized disputes than older men.

## AGE AND TIME HORIZONS

It is also possible, however, that the relationship between a leader's age and the state's foreign policy works in quite the opposite manner, focusing on both a decision maker's ability as well as his or her willingness to use force against other states. If one approaches the question of dispute initiation from the perspective of leaders' abilities to put their preferred policies into action, the political power and influence of individual leaders is obviously an important factor. Older leaders may be more capable of initiating militarized disputes than younger leaders due to more fully consolidated political influence over time. Younger leaders are potentially more likely to owe their place in office to political patrons and be more likely to be constrained by the institutions in which they govern. Older leaders, with more experience and more personal credibility with relevant power brokers, may have more freedom of action than younger leaders, especially concerning foreign policy. One example of this is the presidency of George H. W. Bush in comparison to the presidency of Bill Clinton. Bush, as

a former director of the Central Intelligence Agency, an ambassador, and a vice president, had amassed an enormous amount of institutional credibility in foreign policy that gave him greater latitude to direct U.S. military policy. In contrast, Clinton, who was perceived as a youthful outsider without much experience and an evader of the Vietnam-era draft, faced a relatively narrow set of foreign policy options during his first administration, constrained further by the almost immediate debacle in Somalia.

Coinciding with a greater ability to put their preferred policies into action, relatively older leaders may also be more likely to prefer to start and escalate militarized disputes than younger leaders because the older leaders have shorter time horizons. There is an extensive literature on the importance of time horizons and decision making. Much of this literature builds on research done in psychology and economics regarding the way that people make choices under various time pressures. The anticipated passage of time serves to discount the benefits received from a given action. If pleasure is delayed, it is perceived as less valuable, causing people to choose systematically less preferable options that have more immediate benefits (Loewenstein and Prelec 1992; Prelec and Loewenstein 1991). This notion that people discount potential benefits in the future, instead preferring benefits in the short term, is central to many psychological and economic theories (even Freud argued that people discounted future benefits).

Younger leaders may have relatively longer time horizons and hence be willing to delay taking risky decisions than older leaders for a few reasons. First, younger leaders have the possibility of staying in power for longer periods than older leaders (subject to whether there are term limits on tenure in office). Second, older leaders, concerned about the creation of a legacy and uncertain how long they will remain in power due to health reasons, may be more likely to think in the short term. This time horizon bias may make the initiation and escalation of militarized disputes by older leaders relatively more likely since they will have to attempt to build their legacies faster and therefore be forced to accept riskier choices than they might otherwise.

As historians' annual reviews of American presidential "greatness" demonstrate, those presidents popularly thought of as "great" usually served in times of great political crisis or strife. A leader attempting to build a long-term legacy and needing to consolidate such immortality quickly may implicitly view victory in militarized contests as a way to gain a lasting reputation (C-SPAN 2003). The time horizon argument is also consistent with Downs and Rocke's (1994) gambling for resurrection observation (see also Goemans 2000). This will especially apply to the original initiation of a dispute since it represents a more fundamental choice about the direction of policy, rather than the way a state responds to a threat by another state.

Two additional theoretical perspectives potentially bolster the argument that conflict is more likely when older leaders are in power. First, older leaders are, all things being equal, more likely to have been in office for a long time. As leaders age and gain greater experience, they may also develop a greater sense of hubris regarding their ability to control the events occurring during an international crisis. Older and more experienced leaders may believe that their experience means they can exert more complete control over the initiation and escalation of international conflict, causing them to discount the risk associated with the use of military force. Second, older leaders are

much more likely to experience medical problems. While this may seem unrelated to the probability of international conflict, once leaders undergo serious medical procedures, evidence from Post and Robins (1993) suggests that their time horizons shorten, and they attempt to solidify their legacies and get more done quickly, in anticipation of being forced out of office.[2] One example of this phenomenon is Menachem Begin of Israel. "Facing death and impelled by his dream of creating a secure Israel within biblical boundaries," Begin "made several provocative decisions from his hospital bed, damaging Israel's reputation and international position" (Post and Robins 1993, 202). These arguments imply our third hypothesis:

*Hypothesis 3:* Older men will be more likely to initiate and escalate militarized disputes than younger men.

## THE INTERACTION OF AGE AND REGIME TYPE

Leaders, even those of authoritarian regimes, do not operate in a completely unconstrained environment (Moore 1966; Geddes 1999; Bueno de Mesquita et al. 2003). Leaders are dependent to varying degrees on the opinions and information provided to them by their advisers. Leaders can be relatively free to make decisions on their own or be relatively constrained, depending on the institutional arrangements of the regime in question. In an authoritarian regime, one would expect leaders to be relatively free to make decisions on their own, yet at any time, they would also have access to a relatively more limited range of information when making decisions. Thus, in an authoritarian regime, the importance of age as a factor influencing the decision-making process of a leader is likely to be more important than in a democracy. In a democracy, the institutional constraints due to electoral politics, interest group pressures, and so on, described by Schultz (1999), Bueno de Mesquita et al. (2003), and Reiter and Stam (2002), make it harder for individual leaders to rule by fiat and to consolidate control over the information on which they base their decisions. The greater the institutional constraints on behavior, the less likely it will be that an individual characteristic, such as age, might influence the decision-making process. Thus, the importance of age is likely to diminish in a democracy.

In contrast, we expect that in specific types of nondemocratic regimes, the effects of age should be accentuated. Geddes (1999) describes several different types of nondemocratic regimes, including personalist dictatorships, single-party regimes, and military regimes. The regime type most salient for our work on age and militarized disputes is the personalist dictatorship. Personalist regimes are likely the regimes in which policy is most likely to vary on the basis of an individual leader's preferences or characteristics, meaning the effects of age should be the clearest. As defined by Geddes, "Personalist regimes differ from both military and single-party regimes in

2. Illness type matters as well. If a full recovery is not expected, it increases the relative importance of other leading decision makers and/or can cause succession struggles and so forth (Post and Robins 1993).

that access to office and the fruits of office depend much more on the discretion of an individual leader. The leader may be an officer and may have created a party to support himself, but neither the military nor the party exercises independent decision-making power insulated from the whims of the ruler."

Finally, we hypothesize the following:

*Hypothesis 4:* The more autocratic a state, the more important the age of a leader will be in determining the likelihood of militarized disputes. This should specifically be true for personalist regimes. As democratization increases, the importance of the age of a leader for influencing the likelihood of militarized disputes declines.

In the analysis that follows, we examine whether individual- and group-level findings concerning the relationship between age and the propensity for violence extends to leaders in times of conflict and war. We seek to explore these questions by conducting an analysis of several hundred leaders across several hundred thousand state dyad-years between 1875 and 1999, investigating the impact of age on the propensity for violence.

## RESEARCH DESIGN

The data used for this project is the set of all militarized disputes from 1875 to 2002. We drew the dependent variables from the Militarized Interstate Disputes (MIDS) data set, version 3.0 (Ghosn and Palmer 2003). We generated the dependent variables using EUGene (Bennett and Stam 2000b).We use a directed dyad setup, meaning that in pairs of states, or dyads, where a dispute is initiated or escalated, side A is always the initiator. Directed dyads allow us to most easily track the side of a dispute that initiates the conflict as well as accounting for characteristics of both the initiator and the target in the dispute at the same time. We follow Bennett and Stam's (2000a) recommendations regarding the treatment of dispute joiners and disputes ongoing over multiple years. To increase the efficiency of our analysis while controlling for the relative scarcity of international conflict in the international system, we follow the procedures recommended by King and Zeng (2001a, 2001b) and sample 100 percent of the dispute dyads and 10 percent of the nondispute dyads, yielding more than 100,000 total observations. While it would be possible to speed our data processing by limiting our analysis to politically relevant dyads (contiguous states and major power dyads), since roughly 20 percent of militarized disputes occur between states excluded by the politically relevant designation, using the set of all directed dyads yields eliminates a potential source of bias (Bennett and Stam 2000a, 456-7).

We assembled the dependent variable following the procedures in Bennett and Stam (2004). It is a scale of hostility levels reached during a directed dyad-year, measuring a pair of the state's highest level of hostility on a 1 to 4 scale (Bennett and Stam 2000a, 459). A 1 represents a threat to use force by state A but not the use of force itself, a 2 represents a use of force by either state A or state B, a 3 depicts a use of force

by both parties, and a 4 signifies a war as traditionally defined by the Correlates of War project (1,000 battle deaths).

Given the categorical but unordered nature of the dependent variable and expected nonmonotonic effect of the independent variables, multinomial logit is an appropriate statistical technique (Bennett and Stam 2000a, 460-1). As Bennett and Stam (2000a) describe, multinomial logit allows us to estimate the association of each independent variable at each level of the dependent variable without the constraints imposed by other estimators.[3] The results are more nuanced than those generated with ordered logit because they allow for the possibility that the direction of the independent variables' associated effects may change depending on the value of the dependent variable.[4]

To generate the variables of interest, we used an updated data set on the age of leaders (Chiozza and Goemans 2003, 2004).[5] We used a combination of these two sources to create several variables. Age1 is the age of the leader of the first state in an interstate dyad, and Age2 is the age of the leader of the second state. Age*Initial$^1$ is the age of the leader of side A when he took power, and Age*Initial$^2$ is the age of the leader of side B when he took power. We code the age of the leader at the time of the initiation of the militarized dispute.

The second new variable tested in this study is the interaction of age with regime type. To generate a score for each regime, a state was coded as democratic if it scored at or above a 6 on the Polity IV regime-type scale and a 0 if it was not. The resulting binary variable was multiplied by the age of the leader to create the outcome variable Age*Democracy. We also created an interaction term for the personalist regimes using Geddes's (1999) coding rules, recording a 1 if it is a personalist regime and a 0 if it is not. We multiplied the age of the leader by the personalist regime variable to produce the interaction term Age*Dictator.

One necessary control to isolate the impact of age is the length of time a leader has spent in office. If the logic of hypothesis 3 is correct and institutional constraints on leaders vary with an individual leader's tenure within the overall domestic political system, the length of time leaders are in office will be an accurate proxy for their political power and freedom of action. Research by Gelpi and Grieco (2001, 797) finds that inexperienced leaders are more likely to be the target of international challenges. Potential competitors appear to perceive inexperienced leaders as relatively weak and

3. An alternative would be to employ an even less constrained estimation approach such as neural nets. Given that we have a specific set of hypotheses to test, we choose a somewhat more constrained modeling approach (King and Zeng 2002a).

4. This method is also more appropriate than ordinary least squares regression because the dependent variable is not continuous (King 1989).

5. See Goemans et al. (2004). Since their data set is organized as an annual measure, in which some countries have more than one entry per year, representing periods of leadership turnover, we had to edit the data set to make it amenable to dyadic analysis. During years in which turnover occurred, the leader who was in power for the longest period of time in that year was coded as the leader for that year. For example, although William Clinton was briefly the president of the United States in 2001, George W. Bush is coded as the leader of the United States in 2001 because he was president for the large balance of the year.

6. For a detailed discussion of the problems of selection bias and audience costs, see Schultz (forthcoming).

more likely to have relatively weaker domestic coalitions and hence will be more easily coerced. This makes them the likely targets of challenges.[6] According to Gelpi and Grieco, more experienced leaders are perceived as stronger and are empirically more likely to resist challenges. While this may make the escalation of challenges more likely, it makes the initiation less likely as leaders become more experienced. Therefore, we created and tested an additional variable measuring the length of time an individual leader has been in office at the time that a dyadic observation begins. Leaders' success in military affairs and foreign policy likely also affects their future time in office (Goemans 2000; Reiter and Stam 2002; Bueno de Mesquita et al. 2003).[7]

To isolate the influence of age on the likelihood of militarized disputes, we include additional control variables to account for factors that influence the initiation and escalation of militarized disputes. While the purpose of this article is to isolate the relative importance of political leaders' age in influencing the probability that a militarized dispute is initiated and escalated, including other variables as controls is necessary to avoid omitted variable bias. In addition, although testosterone levels may have an important relationship to the probability of militarized disputes, it is unlikely that they are the most important factor triggering an armed conflict. The effects of an individual leader's varying levels of serum testosterone are most likely relatively weak compared to other factors such as the balance of military capabilities in shaping the way that leaders perceive their potential adversaries' actions and reactions during crises.

We added variables to control for the relative balance of forces between the two sides, the relative satisfaction of a state within a dyad, whether the two states were involved in an arms race, and whether the two states had a defensive alliance. The balance-of-forces variable continuously ranges from .5 to 1, with a 1 indicating an enormous asymmetry of capabilities and .5 representing relative parity. The satisfaction variable varies from 0 to 1, with 0 representing deep dissatisfaction and 1 representing satisfaction with the status quo, while the arms race and defensive alliance variables are 0 when the phenomenon in question is not present and a 1 when it is present. We generated the control variables using EUGene (Bennett and Stam 2004).[8]

## RESULTS

### AGE, TENURE IN OFFICE, AND MILITARIZED DISPUTES

The initial data run estimates a multinomial logit regression model that includes the control variables, the length of time in office variables, and the age variables. Due to limitations in the available data for personalist regimes, to ensure comparability across data runs, the results are limited to the 1946-1999 time period, although they are robust

7. For interesting recent work on this question, see Chiozza and Goemans (2004).

8. All the data for the control variables and for the dyadic setup in general were generated using EUGene, the software program created by D. Scott Bennett and Allan Stam (see Bennett and Stam 2000b).

9. Replication instructions for that data run are included in the instructions on the *Journal of Conflict Resolution* (*JCR*) Web page or are available by contacting the authors.

TABLE 1
Multinomial Logit Equations for the Impact of Leader Age and Length of Time in Office on the Initiation and Escalation of Militarized Disputes, 1946-1999

| | *Conflict Initiation* | | *One Side Uses Force* | | *Both Sides Use Force* | | *War* | |
|---|---|---|---|---|---|---|---|---|
| Balance of forces | −1.326** | (0.299) | −1.170** | (0.263) | −1.755** | (0.278) | −3.300** | (0.792) |
| Arms race | 0.0744 | (0.130) | 0.175** | (0.103) | 0.380** | (0.115) | 0.686** | (0.349) |
| Dyadic satisfaction | −1.058 | (0.736) | −2.989** | (0.511) | 0.191** | (0.769) | −4.312** | (1.216) |
| Defense alliance | 2.326** | (0.403) | 3.137** | (0.286) | 1.622** | (0.428) | 3.057** | (0.759) |
| Peace years 1 | 0.003** | (0) | 0.004** | (0) | 0.005** | (0.001) | 0.010** | (0.004) |
| Peace years 2 | −0.002** | (0) | −0.003** | (0) | −0.004** | (0) | −0.008** | (0.004) |
| Peace years 3 | 0.001** | (0) | 0.001** | (0) | 0.001** | (0) | 0.002** | (0.001) |
| State A leader age | 0.0402** | (0.005) | 0.0457** | (0.004) | 0.014** | (0.004) | 0.0137 | (0.015) |
| State B leader age | 0.0247** | (0.005) | 0.025** | (0.004) | 0.022** | (0.005) | 0.076** | (0.015) |
| State A length in office | 0 | (0) | 0 | (0) | 0** | (0) | −0 | (0) |
| State B length in office | 0 | (0) | 0 | (0) | 0 | (0) | −0 | (0) |
| Constant | −6.705** | (0.555) | −5.668** | (0.456) | −4.911** | (0.535) | −6.736** | (1.487) |

NOTE: Observations = 92,467. Wald $\chi^2(44) = 2002.24$. Prob > $\chi^2 = 0$. Pseudo-$R^2 = .1543$. Log pseudo-likelihood = −7896.2115. Results produced using STATA 8.0. The dependent variables are the columns on top, and the independent variables are the variables along the rows.
*$p < .10$. **$p < .05$.

for the 1875-2002 time period as well.[9] The results, shown in Table 1, demonstrate a consistently statistically significant relationship between the age of the leader of state A and international conflict. As the age of the leader of state A increases, the initiation and use of force against state B becomes more likely. The result is not statistically significant for the escalation to war, although the sign on the coefficient is still positive.

These results provide support for hypothesis 3 regarding the importance of time horizons and the possibility that older leaders will discount the present more than younger leaders, contradicting the declining levels of testosterone hypothesis (hypothesis 2). The result is quite robust. Both the sign of the parameter estimates and the statistical significance levels are stable regardless of the control variables included in the model. These results support the proposition that older leaders are more likely to initiate militarized disputes than younger leaders. These results are consistent with, but do not test directly, our causal logic: first, older leaders have more institutional credibility than younger leaders, allowing them more freedom of action and presumably a greater ability to threaten the use of force and initiate the use of force. Second, older leaders are more likely to engage in short-term legacy building possibly due to shortened time horizons, making the initiation of military force more likely. We also find that as the age of state B's leader increases, state B is increasingly likely to become a target in a dispute initiated by state A. This somewhat contradicts Gelpi and Grieco's (2001) argument that younger, less experienced leaders will be more likely to find themselves the target of international aggression.

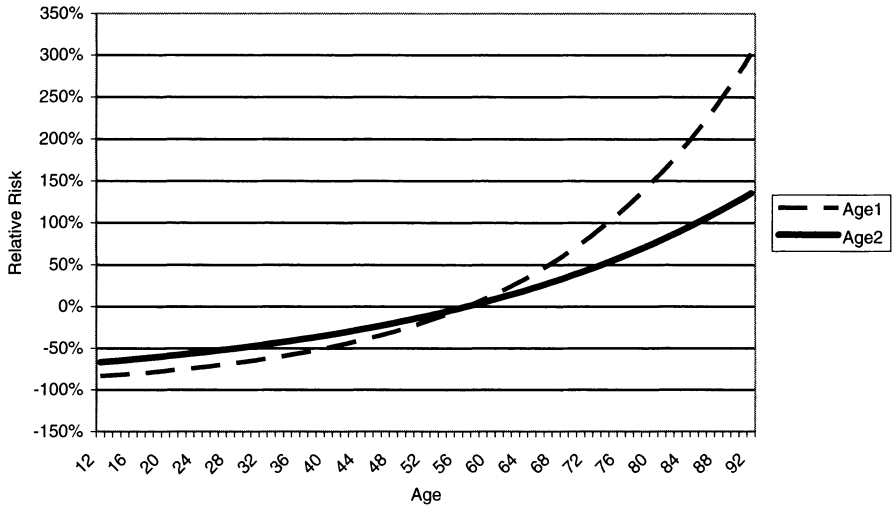


**Figure 1: The Impact of Leader Age on the Relative Risk of Militarized Interstate Dispute Initiation**

NOTE: The figure was produced using the postgr3 command in STATA 8.0. The relative risks were calculated by dividing the risk at a given age from the baseline risk, the median leader age in a baseline regime.

Figures 1 through 4 demonstrate the substantive effects associated with varying leader age.[10] At every level of the dependent variable, increasing the age of the leader of state A from the minimum to the maximum while holding the other variables constant increases the relative risk of conflict by more than 100 percent. The figures also show that similar results hold for state B. The older the leader of state B, the more likely that state B will be challenged by state A. State B is significantly more likely to use force and to escalate the use of force to an all-out war as the age of its leader increases. The decision by state B, the state originally the defender in the militarized dispute, to escalate the dispute to a war is especially important for our results. Older leaders may be especially likely to escalate those disputes in which they can be perceived as a defender since it will create the perception that they are embattled, helping bolster their domestic support.[11]

10. To generate the baseline risk of conflict used to derive the relative risk scores, we calculated the odds of observing each level of the dependent variable with leader age set to its median and the other variables held at their means following procedures outlined in Bennett and Stam (2004).

11. This is not meant to suggest that these results serve as a test of something like diversionary war theory. For more on diversionary war theory, see Bueno de Mesquita and Siverson (1995), Chiozza and Goemans (2003), Downs and Rocke (1994), and Smith (1998).

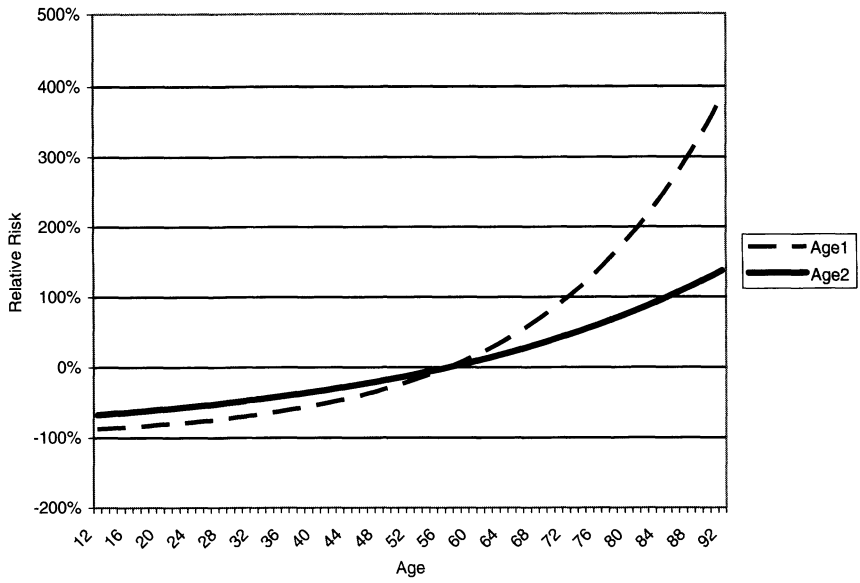


**Figure 2: The Impact of Leader Age on the Relative Risk That One Side Uses Force**
NOTE: The figure was produced using the postgr3 command in STATA 8.0. The relative risks were calculated by dividing the risk at a given age from the baseline risk, the median leader age in a baseline regime.

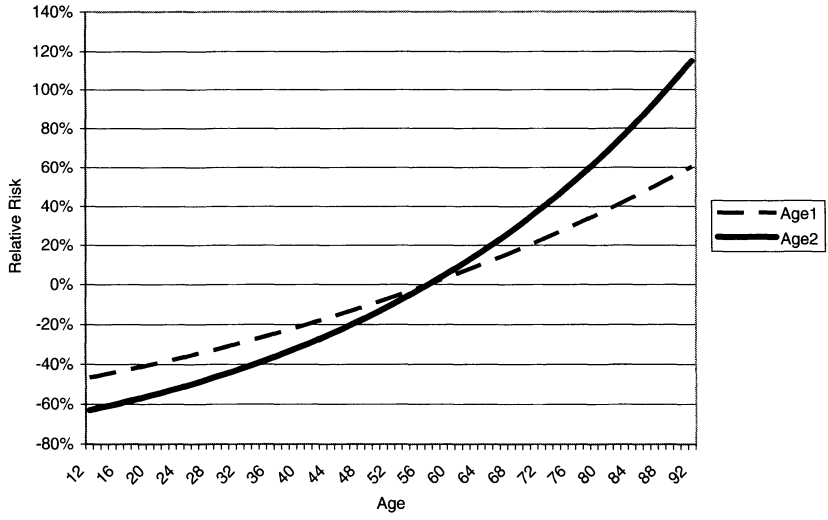


**Figure 3: The Impact of Leader Age on the Relative Risk That Both Sides Use Force**
NOTE: The figure was produced using the postgr3 command in STATA 8.0. The relative risks were calculated by dividing the risk at a given age from the baseline risk, the median leader age in a baseline regime.

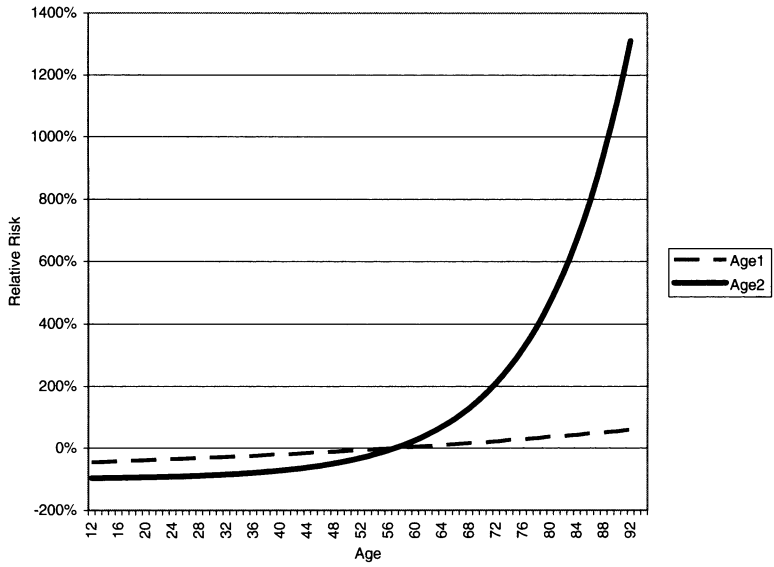


**Figure 4: The Impact of Leader Age on the Relative Risk of War**
NOTE: The figure was produced using the postgr3 command in STATA 8.0. The relative risks were calculated by dividing the risk at a given age from the baseline risk, the median leader age in a baseline regime.

### INTERACTION WITH REGIME TYPE

Next, we estimated a model interacting the tests above with regime-type variables while controlling for democratic and personalist regimes. Unfortunately, due to the limitations in the data, we were able to generate stable results for the personalist interaction terms only for the 1946-1999 period. To be consistent, we therefore restricted our analysis of the democratic regime and baseline regime variables to the 1946-1999 period as well.

Interacting the age variables with the democracy scores converted into dummies reveals a statistically significant relationship for the leader of state A when only one side uses force. In democracies, as leader age increases, the probability that the leader of state A will use force declines relative to nondemocracies (although the term is still slightly positive). None of the other interaction term coefficients is statistically significant. These results provide limited support for our argument since we expect that due to the institutional constraints of democracy, factors such as leader age will matter less than in other types of regimes.[12]

12. To get a better sense of the way democracy interacts with leader age, especially in comparison with other regimes, we plotted the relative risks for the Democracy*Age interaction for side A and compared it to the relative risks for personalist regimes and baseline regimes. Space constraints prevent depicting these figures, but replication information is available on the *JCR* Web page along with the replication information for the rest of the article. The results show that there are substantial increases in relative risk associated with aging leaders in democracies relative to nondemocracies. This effect is relatively constant across the various levels of the dependent variable, although at the highest level of violence, war, the relative impact of increasing leader age in a democracy declines.

TABLE 2

Multinomial Logit Equations for the Impact of Leader Age, Length of Time in Office, and Regime Type on the Initiation and Escalation of Militarized Disputes, 1946-1999

| | *Conflict Initiation* | | *One Side Uses Force* | | *Both Sides Use Force* | | *War* | |
|---|---|---|---|---|---|---|---|---|
| Democratic regimes[a] | | | | | | | | |
| Balance of forces | −1.242** | (0.303) | −1.173** | (0.264) | −1.683** | (0.283) | −3.307** | (0.838) |
| Arms race | 0.037 | (0.132) | 0.196* | (0.106) | 0.342** | (0.119) | 0.638* | (0.358) |
| Dyadic satisfaction | −1.118 | (0.739) | −3.122** | (0.517) | 0.158 | (0.761) | −4.050** | (1.214) |
| Defense alliance | 2.366** | (0.406) | 3.273** | (0.289) | 1.655** | (0.424) | 2.979** | (0.782) |
| Peace years 1 | 0.003** | (0) | 0.004** | (0) | 0.005** | (0.001) | 0.010** | (0.004) |
| Peace years 2 | −0.002** | (0) | −0.003** | (0) | −0.004** | (0) | −0.008** | (0.004) |
| Peace years 3 | 0.001** | (0) | 0.001** | (0) | 0.001** | (0) | 0.002** | (0.001) |
| State A democratic | 0.0407 | (0.557) | 2.910** | (0.487) | −0.980* | (0.536) | −0.621 | (1.797) |
| State A leader age | 0.042** | (0.006) | 0.066** | (0.005) | 0.011** | (0.005) | 0.016 | (0.018) |
| State A Democratic × State A Leader Age | −0.003 | (0.009) | −0.054** | (0.008) | 0.012 | (0.009) | 0.001 | (0.031) |
| State B democratic | −1.178** | (0.588) | 0.171 | (0.429) | 0.613 | (0.529) | 0.147 | (1.673) |
| State B leader age | 0.019** | (0.007) | 0.024** | (0.005) | 0.028** | (0.006) | 0.074** | (0.020) |
| State B Democratic × State B Leader Age | 0.016 | (0.010) | −0 | (0.007) | −0.012 | (0.009) | 0.002 | (0.026) |
| State A length in office | 0 | (0) | −0 | (0) | 0** | (0) | −0 | (0) |
| State B length in office | 0 | (0) | −0 | (0) | −0 | (0) | −0 | (0) |
| Constant | −6.363** | (0.636) | −6.740** | (0.513) | −4.899** | (0.611) | −6.746** | (1.850) |
| Personalist regimes[b] | | | | | | | | |
| Balance of forces | −1.626** | (0.784) | −0.255 | (0.697) | −2.487** | (0.596) | 1.635 | (1.735) |
| Arms race | 0.302 | (0.288) | −0.023 | (0.242) | 0.002 | (0.228) | 0.003 | (0.678) |
| Dyadic satisfaction | 3.261** | (1.026) | −0.155 | (1.208) | 2.230** | (0.719) | 3.539** | (0.695) |
| Defense alliance | 0.281 | (0.589) | 1.784** | (0.673) | −0.016 | (0.472) | −0.084 | (0.956) |
| Peace years 1 | 0.004** | (0.001) | 0.006** | (0.001) | 0.007** | (0.001) | 0.014 | (0.012) |
| Peace years 2 | −0.003** | (0.001) | −0.004** | (0.001) | −0.005** | (0.001) | −0.011 | (0.010) |
| Peace years 3 | 0.001** | (0) | 0.001** | (0) | 0.001** | (0) | 0.003 | (0.003) |
| State A personalist | 3.420** | (1.329) | 2.025* | (1.038) | 2.325** | (0.992) | −0.799 | (4.532) |
| State A leader age | 0.049** | (0.014) | 0.0417** | (0.012) | 0.037** | (0.010) | 0.094** | (0.037) |
| State A Personalist × State A Leader Age | −0.050** | (0.024) | −0.018 | (0.018) | −0.034** | (0.017) | 0.032 | (0.074) |
| State B personalist | 3.386** | (1.667) | 2.809** | (1.206) | 0.603 | (1.461) | −0.084 | (3.13) |
| State B leader age | 0.078** | (0.017) | 0.043** | (0.012) | 0.049** | (0.011) | 0.056** | (0.028) |
| State B Personalist × State B Leader Age | −0.045 | (0.028) | −0.051** | (0.022) | −0.016 | (0.026) | 0.010 | (0.050) |
| State A length in office | 0 | (0) | −0 | (0) | 0 | (0) | −0.001** | (0) |
| State B length in office | −0 | (0) | −0 | (0) | −0 | (0) | −0 | (0) |
| Constant | −12.112** | (1.506) | −7.785** | (1.124) | −7.018** | (1.119) | −15.529** | (3.935) |

*(continued)*

TABLE 2 (continued)

| | *Conflict Initiation* | | *One Side Uses Force* | | *Both Sides Use Force* | | *War* | |
|---|---|---|---|---|---|---|---|---|
| Baseline regimes[c] | | | | | | | | |
| Balance of forces | –1.375** | (0.298) | –1.168** | (0.263) | –1.761** | (0.277) | –3.210** | (0.793) |
| Arms race | 0.061 | (0.131) | 0.119 | (0.106) | 0.325** | (0.117) | 0.499 | (0.351) |
| Dyadic satisfaction | –1.230 | (0.759) | –3.157** | (0.530) | 0.116 | (0.804) | –4.543** | (1.233) |
| Defense alliance | 2.459** | (0.415) | 3.251** | (0.298) | 1.678** | (0.447) | 3.185** | (0.792) |
| Peace years 1 | 0.003** | (0) | 0.004** | (0) | 0.005** | (0) | 0.010** | (0.004) |
| Peace years 2 | –0.002** | (0) | –0.003** | (0) | –0.004** | (0) | –0.008** | (0.004) |
| Peace years 3 | 0.001** | (0) | 0.001** | (0) | 0.001** | (0) | 0.002** | (0.001) |
| State A baseline | –1.887** | (0.642) | 0.974** | (0.491) | 0.330 | (0.565) | 0.527 | (1.747) |
| State A leader age | 0.032** | (0.005) | 0.048** | (0.005) | 0.013** | (0.005) | 0.009 | (0.017) |
| State A Baseline × State A Leader Age | 0.034** | (0.010) | –0.008 | (0.008) | 0.002 | (0.010) | 0.010 | (0.030) |
| State B baseline | –1.234* | (0.739) | –0.827 | (0.527) | –0.828 | (0.624) | 1.586 | (1.830) |
| State B leader age | 0.019** | (0.006) | 0.021** | (0) | 0.018** | (0.005) | 0.080** | (0.017) |
| State B Baseline × State B Leader Age | 0.023* | (0.012) | 0.018** | (0) | 0.018* | (0.010) | –0.013 | (0.028) |
| State A length in office | –0 | (0) | –0 | (0) | 0** | (0) | –0 | (0) |
| State B length in office | 0 | (0) | –0 | (0) | –0 | (0) | –0 | (0) |
| Constant | –5.835** | (0.605) | –5.599** | (0.537) | –4.695** | (0.571) | –7.000** | (1.406) |

NOTE: Results produced using STATA 8.0. The dependent variables are the columns on top, and the independent variables are the variables along the rows. For each data run, a dummy was inserted for baseline, democracy, or personalist regimes, which is reflected in the results.

a. Observations = 92,467. Wald $\chi^2(60) = 2184.72$. Prob > $\chi^2 = 0$. Pseudo-$R^2 = .1596$. Log pseudo-likelihood = –7846.2446.

b. Observations = 14,748. Wald $\chi^2(60) = 1042.84$. Prob > $\chi^2 = 0$. Pseudo-$R^2 = .259$. Log pseudo-likelihood = –1228.1541.

c. Observations = 92,467. Wald $\chi^2(60) = 2053.85$. Prob > $\chi^2 = 0$. Pseudo-$R^2 = .1593$. Log pseudo-likelihood = –7849.5051.

*$p < .10$. **$p < .05$.

When we added the variable for personalist regimes and the interaction between personalist regimes and leader age to the model, the results show that the importance of age in personalist regimes is magnified and consistent with the testosterone hypothesis. Unlike the case for other types of regimes, where a leader's increasing age either does not matter or increases the probability of conflict, in personalist regimes, younger leaders are relatively more likely to both initiate and escalate disputes. This comports with our understanding of regimes in general since one would presume that personalist regimes are those in which the individual preferences of the leader, which are predicted to vary based on the leader's age, will be most clearly translated into policy outcomes. Also, the institutional power base of personalist leaders may not substantially change over time, meaning increasing age has a larger relative effect. In democracies,

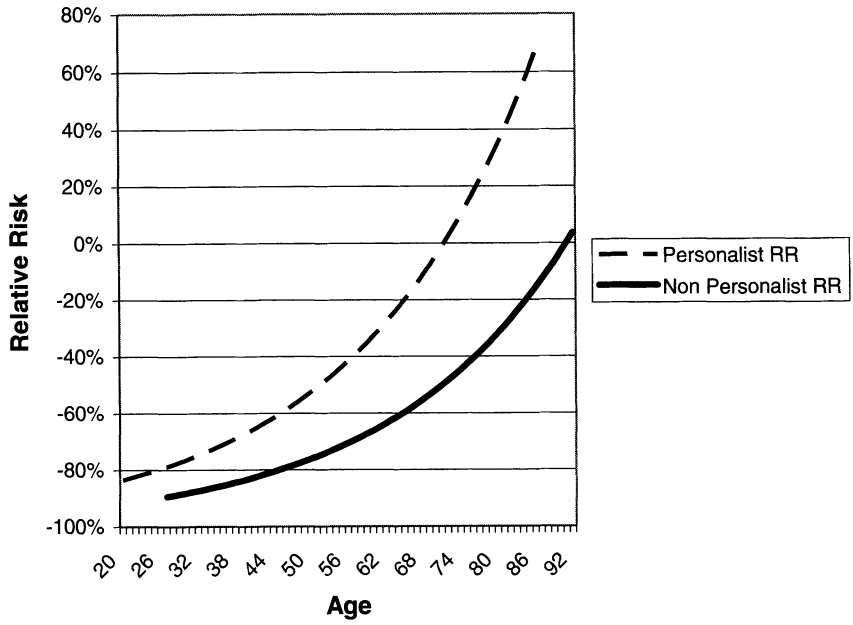


**Figure 5: Impact of Personalist Regimes on Relative Risk of Dispute Initiation for State A—Excluding Age–Regime Type Interaction**

NOTE: The figure was produced using the postgr3 command in STATA 8.0. The relative risks were calculated by dividing the risk at a given age from the baseline risk, the state A median leader age in a state A baseline regime.

institutional constraints may be less effective in constraining the more conflict-prone tendencies of older leaders since they are the leaders with greater institutional capacity to impose their preferences on the system. In personalist regimes, in which those constraints are lowered, the testosterone-related effects of age are accentuated.

It is especially interesting that while increasing leader age in general makes conflict more likely and personalist regimes make conflict more likely, the coefficient for the interaction between age and personalist regimes is usually negative, and the relative risks show that increasing age has a relatively lower effect on conflict in personalist regimes than in baseline regimes. This effect is most clearly shown in Figures 5 and 6. In Figure 5, we plot the probability of dispute initiation using a model that does not include the interaction term for age and personalist regimes.

Figure 6 shows the probability of dispute initiation with the interaction term included in the model. Note the difference between the relative risk of conflict in personalist regimes as leader age increases when there is no Age*Personalist regime interaction term (Figure 5) versus when the interaction term is included. In the latter case, there is a slight dampening effect for personalist regimes in comparison with

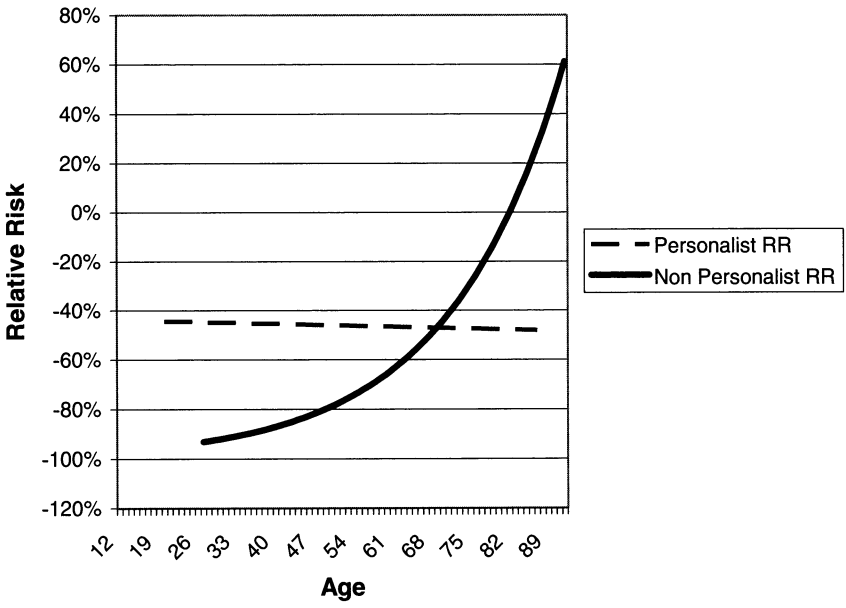


**Figure 6: Impact of Personalist Regimes on Relative Risk of Dispute Initiation for State A—Including Age–Regime Type Interaction**

NOTE: The figure was produced using the postgr3 command in STATA 8.0. The relative risks were calculated by dividing the risk at a given age from the baseline risk, the state A median leader age in a state A baseline regime.

nonpersonalist regimes. This shows a relatively declining propensity for older personalist leaders to initiate and escalate militarized disputes.[13]

These results should also introduce a cautionary note into the conclusions about the relative importance of the age variables. Given that the interaction of age with regime type is not statistically significant at all levels of dispute escalation, in the context of those regimes in which leaders are relatively less constrained, the relative importance of age declines. Therefore, while age in general significantly influences the probability of militarized disputes, the effect is constrained by other variables.

The results also provide some support for both the testosterone and time horizon hypotheses. Given the lack of regime-based constraints, one would expect younger leaders in personalist regimes to be more conflict prone than older leaders. The results show that the relative risk of conflict initiation for personalist regimes in comparison with other types of regimes declines as leader age increases. But the increase is relatively small. This could be because the lack of institutional constraints means that the

13. While the coefficients and relative risks for the democracy variables are somewhat different for the post–World War II period than for the sample as a whole, it is entirely possible that this is due to the cold war–influenced nature of conflict in the vast majority of the post–World War II period.

impact of our psychological explanations is heightened in personalist regimes. As leaders age and testosterone decreases, time horizons shorten, replacing the effect of testosterone for personalist regimes. The results for democracies show that older leaders are relatively more conflict prone in comparison with personalist regimes but less conflict prone than older leaders in baseline (or intermediate) regimes. This could be because institutional constraints in nondemocracies will be relatively weaker than in baseline regimes, meaning older leaders in baseline regimes are more able than democratic leaders to exercise their military preferences as time horizons shorten.

## LIMITATIONS

While this study has begun to test a narrow range of first-image theories, now possible due to the increasing complexity of statistical models and better data availability, there are several limitations to this research. First, the statistical tests conducted in this study are a substantially constrained proxy for the theory of interest described in the literature review. Although testosterone levels may significantly influence the way that leaders make decisions, especially in the case of decisions regarding the use of military force, it is not possible to accurately measure the testosterone of leaders for these cases. Age is only a proxy for testosterone levels. Furthermore, while age is generally an accurate indicator of testosterone, with testosterone levels declining with an individual's age, it is generally difficult to predict the testosterone levels of any specific individual. Variance in the level of testosterone across individuals can be quite large, but there is reason to expect that those who self-select, gain, and maintain power in national leadership positions are more likely to be those starting from a relatively high level of testosterone. However, this individual variance in testosterone level means that while the results above are important, they are far from a definitive word on the relationship between testosterone levels and the outbreak of militarized disputes.

In addition, hypothesis 3 presumes that time horizons operate to increase the likelihood that older leaders initiate militarized disputes. However, older leaders may have longer time horizons than younger leaders because they are more likely to have children. The presence of children may cause leaders to value more highly the future because they want to protect their children. Therefore, older leaders may be less likely to take the ultimate risk, the risk of war, due to a desire to protect their children. The existence of children also should shift the relative testosterone levels of leaders.

Several studies appear to support the notion that fatherhood pushes testosterone levels even lower than does marriage. This is consistent with a model that assumes a direct trade-off between competitive/mating behaviors and parenting ones. In the empirical literature, one study found that first-time fathers possessed lower levels of testosterone than male controls. Testosterone concentrations and variance were lowest in the new father population immediately after their wives gave birth (Berg and Wynne-Edwards 2001). In another study, Storey et al. (2000) also found that males showed lower levels of testosterone just after their wives had given birth. Therefore, a follow-up to this research should code for whether leaders have children, potentially introducing a more accurate proxy for both testosterone levels and time horizons.

Other important psychological conjectures that could be tested in future research include whether a leader is married, which negatively influences testosterone levels, and whether birth order influences personality type. Finally, statistical research done for this project should be supplemented with case studies that do process tracing. Process tracing will also help researchers to understand the specific mechanisms through which first-image variables such as age influence decision making.

## CONCLUSIONS

The analysis presented in this article tests the relationship between the age of national leaders and the outbreak of militarized disputes, finding that older leaders are significantly more likely to initiate and escalate militarized disputes than younger leaders. However, the effect reverses for leaders in personalist regimes, in which younger leaders are more likely to both initiate and escalate disputes. This outcome has clear implications for scholars concerned with international diplomacy and crisis bargaining. Game theorists and quantitative scholars have created incredibly complex models of decision making in the past few decades in an attempt to specify the causal processes used by leaders. Given the clear importance of age in influencing the way that leaders make decisions about militarized disputes, this study demonstrates both the inadequacies of past research and possibilities for future modeling enterprises. More broadly, this study demonstrates the utility of quantitatively evaluating so-called first-image theories of international politics. While system- and state-level variables are clearly important factors influencing the initiation and escalation of militarized disputes, the behavioral characteristics of the leaders of countries are important as well. Future research should build on this insight and attempt to develop further statistical tests measuring the relative importance of specific individual leadership characteristics in the initiation and escalation of militarized disputes.

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