www.AUSTRALIANACADEMICPRESS.com.au

ARTICLE AVAILABLE ONLINE
Twin Research and Human Genetics
Volume 15 ▮ Number 1 ▮ pp. 60–70

Fear and Attitudes Towards Torture and Preventive War

Allan C. Stam, Alexander Von Hagen-Jamar, and Alton B. H. Worthington
Department of Political Science, University of Michigan

This paper examines the association between individuals' beliefs that the world is a dangerous place and their support for a variety of national security policies. We find that the source of the covariance between perceived danger and support for aggressive national security policies is primarily due to a common genetic factor. Latent genetic factors that influence individuals' perception of danger also appear to influence their positions on policies purported to alleviate such danger. Covariation between individuals' experiences and genes suggests that priming messages alone do not drive the covariation between feelings of danger and acceptance of policy changes.

■ Keywords: public opinion, perceptions of danger, political cues, political attitudes, preventative war, torture

Individuals' general beliefs, such as their perception that the world is an inherently dangerous place, correlate with their opinions of various security policies, such as the relative usefulness of preemptive military force as a tool of U.S. foreign policy. In many policy areas where the optimal policy choice is open to debate, voters rely on their general perceptions about human nature and the world around them when forming opinions about competing public policies. In this paper we address the question of whether the correlation between an individual's perception of danger and their political beliefs about national security policies is the product of common genetic factors or is environmental in origin. Answering this question contributes to a broader debate about the manner in which political beliefs about national security are influenced by the public's perception of danger.

The political story of the manipulation of fear is straightforward: politicians argue for security policies on the basis that they will save lives. A useful political strategy is to portray the world as inherently dangerous, and aggressive or proactive security policies as the best defense against both specific and inchoate dangers. In the years immediately prior to the collection of our data, after the attacks of 9/11 on the World Trade Center and the Pentagon, Bush administration officials widely cited the risk of subsequent attacks on the U.S. by al Qaeda as justification for a variety of policy initiatives. These included the torture of terrorism suspects (Bush, 2008), increased military spending, and the second Iraq War (VandeHei, 2004). Often, in the absence of hard evidence to support a given policy, the Bush administration used fear-based messages in an attempt to sway public opinion. For example, the rhetoric surrounding discussions of Iran's nuclear program focused on messages of danger and uncertainty regarding Iran's ambitions, rather than on fact-based descriptions of the situation (DiMaggio 2009, pg. 136). This phenomenon is not new. Fear has been an important tool in governments' attempts to mobilize support for both domestic and foreign political goals.

The role of fear in politics and in the development of political attitudes has been the subject of much recent scholarship (Abramson, Aldrich, Rickershauser, & Rohde, 2007; Altheide, 1997; Brader, 2005; Gross, Brewer

RECEIVED 17 October, 2011; ACCEPTED 01 December, 2011.

ADDRESS FOR CORRESPONDENCE: Allan C. Stam, Department of Political Science, University of Michigan, 505 S. State Street, Ann Arbor MI 48109-1045. Email: stam@umich.edu

& Aday, 2009; Hatemi 2009; Huddy, Feldman, Taber, & Lahav, 2005; Jost, et. al., 2007; Lerner, Gonzalez, Small, & Fischhoff, 2003; Lupia & Menning, 2009; Oxley et al., 2008; Perrin, 2005; Robin, 2004). Fear, in this literature, sometimes refers to an immediate emotional response to some real or perceived threat. Other work evaluates subjects' vulnerability or tendency towards phobias, and that relationship with political attitudes. This paper addresses a related but distinct idea.

We evaluate some of the associated effects and attitudes correlated with a respondent's belief that the world is an inherently dangerous place. Our work provides a better understanding of how the manipulation of fear can affect political outcomes, and addresses the ability of politicians to manipulate voters through fear-inducing communication. Guided by the substantial body of work on the heritability of social and political attitudes (Alford, Funk & Hibbing, 2005; Eaves & Hatemi, 2008; Verhulst et al. 2010; Hatemi et al., 2009; Fowler, Baker, & Dawes, 2008; Fowler & Dawes, 2008; Fowler & Schreiber, 2008; Hatemi et al., 2007), we inquire about the nature of the association between the belief that the world is dangerous and support for policies often associated with fear-related political communication, such as the torture of terrorism suspects and the advisability of preventively invading sovereign states.

The belief that politicians can manipulate voters' perception of danger to manipulate their policy preferences has primarily relied on the assumption that most people will react to a threat stimulus in a uniform manner. This premise suggests that as the public becomes persuaded that the world is dangerous, people should support increasingly hawkish policies. This conventional wisdom persists in the context of recent evidence that political opinions are genetically influenced and individuals are differentially influenced by fear primes (Martin et al., 1986; Oxley et al., 2008). A notable exception is Hetherington and Suhay (2011), who find that people who do not have authoritarian personality traits respond differently to messages of threat than those who do. Authoritarian personality traits correlate with hawkish views independent of fear signals, while those without authoritarian traits may respond to messages of threat by becoming more hawkish. This stands in contrast to prior theories that the latent traits themselves were being primed. Their findings are consistent with our own, and suggest that individuals vary in how they respond to messages of danger.

It remains unclear if fear-based message priming works by evoking an individual's latent genetic influences, presenting as an increasing tendency to view that the world as an inherently dangerous place. If some people are inherently more sensitive to fear-based messages, they may be more vulnerable to political manipulation through such messages. This is true regardless of the accuracy of the messages or value of the policies being promoted. It could be good that people respond to signals of danger, because it allows policies to adapt democratically. It could also be negative, because elites manipulate people for their own ends. See McDermott and Hatemi (2010) for a more extensive discussion of the normative implications of biological research on political behavior. Alternatively, perceptions of danger and subsequent evaluation of policy options may be conditioned by individuals' prior experiences rather than the innate aspects of their personality type.

Below, we find that individuals' belief that the world is dangerous (or not) and their support of hawkish foreign policies are related through a mutual latent genetic component. For individuals with certain innate predispositions, politicians may be able to manipulate their attitudes by employing political messages that signal danger. Our results also suggest that the effects of the messages are not distributed uniformly across the population. We cannot tell using our data whether the relationship between perception of danger and hawkishness is directly a result of priming by the Bush administration or other political sources, because all individuals in the sample have been exposed to the signal. We can conclude that, given that everyone has received signals of danger, some are hawkish and some are not, and that correlates with genetic characteristics. Therefore, either the signals have no effect, and the hawkishness on policies is driven by the same latent genetic characteristic that drives the perception of a dangerous world, or individuals with a particular genetic makeup responded to the signal differently. We focus on the latter, more modest claim in the body of the paper, but our findings are not inconsistent with the proposition that attitudes about national security are immutable via external stimuli. We propose that the variance of 'fear effects' results from individual differences regarding risk sensitivity (Kendler et al., 2008).

We proceed in the following manner: First, we describe the data, including cursory evidence that perception of danger is related to hawkish attitudes for the relevant policies. Next, we briefly describe our methodological approach. Following that, we estimate the univariate genetic, common environmental, and unique environmental components for each of our measures. Our final analysis is a set of correlated factors' bivariate decompositions demonstrating the associations between attitudes about whether the world is dangerous and each of the security policy questions. We conclude with a section that summarizes our results and discusses the relevance of our findings for future work on national security policy and fear.

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

Data and Survey

Overview

The data are drawn from a political values survey of 1,349 adult twins drawn from the Minnesota Twin Family Registry, reduced to 1,192 due to missing data (356 monozygous pairs and 240 dizygous pairs). The data collection took place between July 2008 and October 2009. The overall cooperation rate for the survey was 61%. For more details on the sample and collection see Hatemi et al. (2012) in this issue. We use five survey responses in our analysis.

The questions were: '(1) Choose one: Society works best when people realize the world is dangerous OR People assume that all those in far-away places are kindly.' Then, 'Do you (*Agree*, *Uncertain*, or *Disagree*) with: (2) Allowing torture of terrorism suspects; (3) the Iraq War; (4) current military spending?' and '(5) Some people believe that the United States should solve international problems by using diplomacy and other forms of international pressure, and use military force only if absolutely necessary (Position 1). Others believe diplomacy and pressure often fail and the U.S. must be ready to use military force (Position 7). Where would you place yourself on this scale?'

All responses are used for each topic. For 'uncertain' responses, we categorized subjects equidistant between 'agree' and 'disagree'. Uncertain responses likely represent moderate, or conditioned, opinions on the issue in question. In some cases, respondents provided nonapplicable answers to the survey question. We dropped these from the sample.

The first question investigates an underlying belief that the respondent has about the world: 'Is the world a dangerous place?' It is important to note that while we refer repeatedly to fear in this paper, we mean the belief

TABLE 1

Summary of Responses, Zygosity Pooled

	Respondents (*N*)	% Sample
Belief that world is dangerous		
Yes	806	68.02
No	379	31.98
Torture		
Yes	199	16.76
Uncertain	312	26.28
No	676	56.95
Support Iraq War		
Yes	235	19.81
Uncertain	319	26.90
No	632	53.29
Approve military spending		
Yes	253	21.33
Uncertain	457	38.53
No	476	40.13
Force in foreign policy		
1	341	28.75
2	216	18.21
3	196	16.53
4	168	14.17
5	118	9.95
6	62	5.23
7	85	7.17

TABLE 2

Summary of Respondents, Zygosity Pooled

	Male Pairs		Female Pairs	
	Respondents (*N*)	% Sample	Respondents (*N*)	% Sample
Belief that world is dangerous				
Yes	461	63.24	345	75.66
No	268	36.76	111	24.34
Torture				
Yes	83	11.35	116	25.44
Uncertain	187	25.58	125	27.41
No	461	63.06	215	47.15
Support Iraq War				
Yes	134	18.33	101	22.20
Uncertain	209	28.59	110	24.18
No	388	53.08	244	53.63
Approve military spending				
Yes	151	20.68	102	22.37
Uncertain	271	37.12	186	40.79
No	308	42.19	168	36.84
Force in foreign policy				
1	216	29.63	125	27.35
2	138	18.93	78	17.07
3	127	17.42	69	15.10
4	97	13.31	71	15.54
5	76	10.43	42	9.19
6	27	3.70	35	7.66
7	48	6.58	37	8.10

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

TABLE 3

Summary of Responses, Gender Pooled

	MZ Pairs		DZ Pairs	
	Respondents (*N*)	% Sample	Respondents (*N*)	% Sample
Belief that world is dangerous				
Yes	478	67.51	328	68.76
No	230	32.49	149	31.24
Torture				
Yes	112	17.18	77	16.14
Uncertain	180	25.35	132	27.67
No	408	57.46	268	56.18
Support Iraq War				
Yes	147	20.70	88	18.49
Uncertain	179	25.21	140	29.41
No	384	54.08	248	52.10
Approve military spending				
Yes	143	20.17	110	23.06
Uncertain	279	39.35	178	37.32
No	287	40.48	189	39.62
Force in foreign policy				
1	187	26.38	154	32.29
2	139	19.61	77	16.14
3	116	16.36	80	16.77
4	95	13.40	73	15.30
5	75	10.58	43	9.01
6	44	6.21	18	3.77
7	53	7.48	32	6.71

Note: MZ = monozygotic, DZ = dizygotic.

that the world is a dangerous place, not the emotional response that can take place when information about danger is received. This distinguishes our work from that of many others that deal primarily with emotional responses (for example, Brader, 2005; Lupia & Menning, 2009; and others) or predispositions to anxiety or phobias (Kendler et al., 2008). The belief that the world is a dangerous place (and that others ought to know that) may be correlated with an emotional reaction to information or with personality traits, but in this study we do not (and cannot) address either. The remaining questions measure the respondents' national security policy attitudes. Three relate to specific U.S. policy responses to security threats, while the final question addresses military intervention as a general policy. Substantively, individuals' responses to the policy question are correlated with their attitudes about whether the world is a dangerous place. Both genetic and environmental factors affect the translation of perceived danger into policy preferences.

Following an overview of responses to the questions, we present some summary findings on the relationship between fear and policy preferences. Next, we demonstrate that the assumptions of the variance components approach are not violated. We then present findings from univariate analysis of each of the traits described above. Finally, we analyze bivariate relationships between fear and foreign policy preferences.

Summary of Survey Responses

Within the sample, 68% of respondents (806 of 1185) believe the world is a dangerous place. However, only 17% agree with the use of torture of terror suspects, 20% support the Iraq War, and 21% agree with then-current levels of military spending. Aggregated responses are shown in Table 1.

When comparing males and females in the sample, it appears that females are more hawkish, with higher per-

TABLE 4

Polychoric Correlations Among Responses

	Perception of danger	Acceptance of torture	Support Iraq War	Approve military spending	Use of force in foreign policy
Perception of danger	1.00				
Acceptance of torture	.39	1.00			
Support Iraq War	.31	.35	1.00		
Approve military spending	.36	.35	.58	1.00	
Use of force in foreign policy	.32	.37	.58	.44	1.00

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

TABLE 5

Twin Correlations for Perception of World Danger and Policy Variables

	MZ	95% CI	DZ	95% CI
Belief that world is dangerous	.35	[.18, .50]	.14	[–.08, .35]
Acceptance of torture	.42	[.29, .53]	.3	[.13, .45]
Support Iraq War	.45	[.33, .56]	.25	[.08, .40]
Approve of military spending	.41	[.29, .52]	.25	[.09, .40]
Use of force in foreign policy	.35	[.24, .45]	.17	[.01, .29]
N Pairs	356		240	

Note: MZ = monozygotic, DZ = dizygotic, CI = confidence interval.

centages approving of torture (25% versus 11%), supporting the Iraq War (22% versus 18%), and supporting the use of force in foreign policy (25% versus 21% giving a 5-or-higher score). Females also have a higher perception of the world as a dangerous place (76% versus 63%). With this in mind, the causal relationship between perceptions of danger and foreign policy views appears consistent across sex (Table 2).

Individual twins also appear roughly consistent in their responses, regardless of zygosity. In most areas of interest, the respondents hold consistent opinions. There is one exception: force in foreign policy. Here, monozygotic twins appear to be somewhat more hawkish (24% versus 19% giving a 5-or-higher score; Table 3).

Correlations among perception of danger and policy issues suggest that there is a relationship between general beliefs about the world and acceptance of foreign policies. However, perceptions of danger do not appear to correlate perfectly with policy views, nor do policy views correlate perfectly with one another. There is variation among the responses, which makes independent investigation of each policy position worthwhile (Table 4).

Responses Within Twin Pairs

In order to determine the strength of the relationship between both environmental and genetic variance and political opinions (danger perception and policy positions), we estimated polychoric correlations for each phenotypic trait (Table 5). Due to the limited size of the sample, we pooled male and female respondents. Correlation estimates were checked for consistency using John Fox's 'polycor' package in R 2.13.0.

Twin Model Methodology

To estimate the genetic and environmental sources of attitudinal variation, we implemented variance components modeling (see Neale & Cardon, 1992; Medland and Hatemi, 2009). Shared variance, both genetic and environmental, differs by zygosity. For monozygotic (MZ) twins, the covariance was defined as additive genetic effects (A) plus common environment (C). For dizygotic (DZ) twins, who share a common household environment but only half their segregating genes, the covariance was defined as .5A plus C. We follow the common assumption that the unique environmental (E) sources of variance are unshared between cotwins, and so only contribute to trait variance. Genetic and environmental parameters were estimated through

TABLE 6

Univariate ACE Model Results, Perception of World as Dangerous

Model	Variance Estimates			Fit Statistics			
	a^2	c^2	e^2	–2LL	Δdf	*p*-value	Comp. Model
ACE	.34 [.11, .42]	.00 [0.00, .19]	.66[.57, .75]	1137.16			
AE	**.34 [.25, .42]**		**.66[.58, .75]**	**1137.16**	**1**	**1**	**ACE**
CE		.27 [.19, .34]	.73[.66, .81]	1144.58	1	.01	ACE
E			1.00 [1.00, 1.00]	1188	2	0	ACE

Note: A=Additive Genetic Effect, C=Common Environment Effect, E=Unique Environment Effect, –2LL= –2*log (likelihood ratio of H1/H0), df=degrees of freedom; values in brackets are 95% confidence intervals; bolding = preferred model.

TABLE 7

Univariate ACE Model Results, Approve Torture of Terror Suspects

Model	Variance Estimates			Fit Statistics			
	a^2	c^2	e^2	–2LL	Δdf	*p*-value	Comp. Model
ACE	**.24 [0.00, .49]**	**.18 [0.00, .40]**	**.58 [.50, .67]**	**1096.56**			
AE	.44 [.36, .51]		.56 [.49, .64]	1098.66	1	.15	ACE
CE		.37 [.30, .44]	.63 [.56, .70]	1099.67	1	.08	ACE
E			1.00 [1.00, 1.00]	1188	2	0	ACE

Note: A=Additive Genetic Effect, C=Common Environment Effect, E=Unique Environment Effect, –2LL= –2*log (likelihood ratio of H1/H0), df=degrees of freedom; values in brackets are 95% confidence intervals; bolding = preferred model.

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

TABLE 8

Univariate ACE Model Results, Approval of Iraq War

Model	Variance Estimates						
	a^2	c^2	e^2	–2LL	Δdf	*p*-value	Comp. Model
ACE	0.40 [.13, .53]	.05 [.00, .28]	.55 [.47, .63]	1092.25			
AE	**.45 [.37, .53]**		**.55 [.47, .63]**	**1092.41**	**1**	**.69**	**ACE**
CE		.37 [.30, .44]	.63 [.56, .70]	110.79	1	0	ACE
E			1.00 [1.00, 1.00]	1188	2	0	ACE

Note: A=Additive Genetic Effect, C=Common Environment Effect, E=Unique Environment Effect, –2LL= –2*log (likelihood ratio of H1/H0), df=degrees of freedom; values in brackets are 95% confidence intervals; bolding = preferred model.

TABLE 9

Univariate ACE Model Results, Approve Level of Military Spending

Model	Variance Estimates						
	a^2	c^2	e^2	–2LL	Δdf	*p*-value	Comp. Model
ACE	**.32 [.04, .49]**	**.09 [0.00, .32]**	**.59 [.51, .68)]**	**1107.24**			
AE	**.42 [.34, .49]**		**.58 [.51, .66]**	**1107.74**	**1**	**.48**	**ACE**
CE		.35 [.27, .41]	.65 [.59, .72]	1112.43	1	.02	ACE
E			1.00 [1.00, 1.00]	1188	2	0	ACE

Note: A=Additive Genetic Effect, C=Common Environment Effect, E=Unique Environment Effect, –2LL= –2*log (likelihood ratio of H1/H0), df=degrees of freedom; values in brackets are 95% confidence intervals; bolding = preferred model.

TABLE 10

Univariate ACE Model Results, Level of Force in Foreign Policy

Model	Variance Estimates						
	a^2	c^2	e^2	–2LL	Δdf	*p*-value	Comp. Model
ACE	.34 [.06, .43]	.00 [.00, .24]	.66 [.57, .74]	1136.31			
AE	**.34 [.26, .43]**		**.66 [.57, .74]**	**1136.31**	**1**	**1**	**ACE**
CE		.27 [.20, .35]	.73 [.65, .80]	1134.2	1	.03	ACE
E			1.00 [1.00, 1.00]	1188	2	0	ACE

Note: A=Additive Genetic Effect, C=Common Environment Effect, E=Unique Environment Effect, –2LL= –2*log (likelihood ratio of H1/H0), df=degrees of freedom; values in brackets are 95% confidence intervals; bolding = preferred model.

maximum likelihood estimation in OpenMx version 1.0.7-1706, in R version 2.13.0. The comparative fit of submodels (A or C) was tested using the chi-square likelihood ratio test. Unique environment (E), which incorporates measurement error, is included in all models. In tests of bivariate correlation, significant phenotypic correlations between the variables were decomposed into genetic and environmental components of variance using a Cholesky (or triangular) decomposition of covariance (see Neale & Cardon, 1992). Due to the differences in number of thresholds between the variables in these bivariate models, we use a correlation matrix as the data input, rather than raw data. For consistency between univariate and bivariate results, all models are estimated using previously computed polychoric correlations. Univariate results were checked against raw data estimation results, and no major discrepancies were found. All models were tested with a variety of restrictions, and the authors' preferred model is displayed in bold in the tables of results. Fit statistics are presented for all models and submodels for comparison.

Univariate Results

In order to separate environmental (both common and individual) effects from genetic effects, it is necessary to model the variance in the respondents' answers using structural equation modeling. As described above, decomposition of total variance in responses into genetic, common environmental, and individual environmental components sheds light on how an individual's opinions are shaped by messages of fear. The results are shown in tables 6 to 10. In all results, the preferred models are presented in bold.

In most of the responses above, variance in individual responses appears driven primarily by genetic and individual environmental factors. Note that we assume an individual's exposure to fear signals is captured by the unique environmental variance. Without direct measurement of an individual's exposure to public messages

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

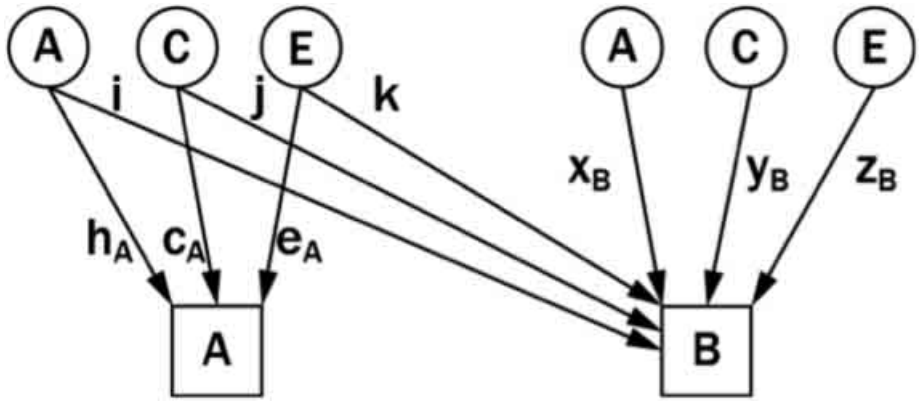

FIGURE 1
Bivariate ACE–Cholesky decomposition.

of fear, we cannot measure how genetics moderates an individual's response to these types of messages. Instead, we interpret these results as explaining what aspects of political attitudes are associated with fear messages presented by politicians.

Bivariate Correlated Factors Results

To investigate the sources of variation in foreign policy public opinion, linking individuals' general worldviews to specific policy positions requires a method that estimates the correlation in sources of variation for each issue. Through a transformation of the path estimates generated by Cholesky decomposition, it is possible to generate the correlated factors estimates of variance in multiple phenotypes (Loehlin, 1996). This method uses calculations of variance according to the paths specified in Figure 1, and transforms them into a set of individual-phenotype variance measures with correlations between the sources of phenotypic variance seen in Figure 2. When interpreting these results, one must consider both the magnitude of variance from each source (additive genetic, common environmental, individual environmental) and the magnitude of the correlation between the sources for each phenotype (for example, additive genetic variance for A and additive genetic variance for B). The interpretation of the path estimates for each individual phenotype are similar to the univariate results, but the additional information provided by the correlation of the factors gives a richer understanding of the sources of variance.

From estimates of variance computed using polychoric correlations, we present transformed results that show the total sources of variance for each policy (perceptions of danger and support for the Iraq War, etc.) and the correlation of the same sources of variance (genetic, common environmental, individual environ-

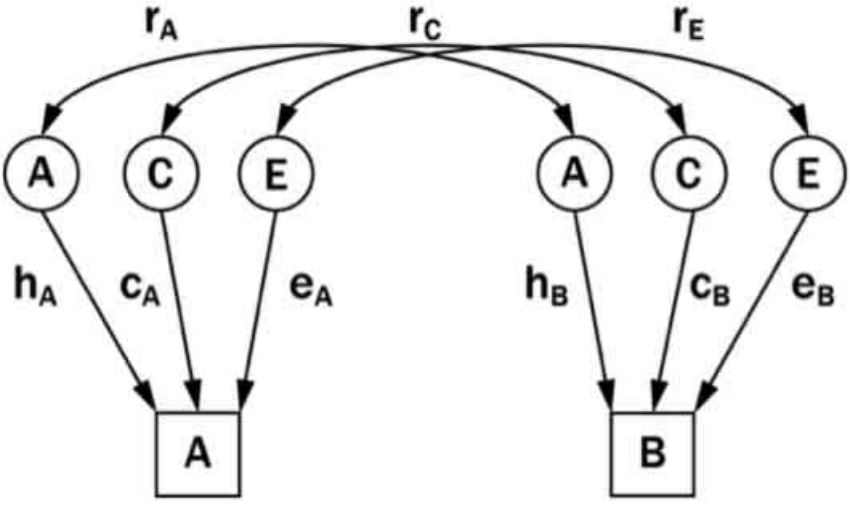

FIGURE 2
Bivariate ACE-correlated factors.

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

TABLE 11

Bivariate Correlated Factors Results, World Danger and Acceptance of Torture

	Correlated Factors Path Estimates									Comparative Fit Statistics			
Model	Ha	Ca	Ea	Ra	Rc	Re	Hb	Cb	Eb	–2LL	Δdf	*p*-value	Comp. Model
ACE–ACE	.56	.12	.82	1.00	1.00	.14	.44	.45	.77	2051.87			
AE–ACE	**.57**		**.82**	**1.00**		**.14**	**.52**	**.37**	**.77**	**2052.4**	**2**	**.77**	**ACE-ACE**
CE–ACE		.52	.86		.86	.20	.22	.58	.79	2059.22	2	.03	ACE-ACE
ACE–AE	.55	.14	.82	.84		.14	.65		.76	2055.48	2	.16	ACE-ACE
ACE–CE	.35	.41	.84		1.00	.20		.61	.79	2058.09	2	.04	ACE-ACE
AE–AE	.57		.82	.81		.14	.65		.76	2055.51	3	.3	ACE-ACE
CE–CE		.52	.86		.82	.19		.61	.79	2059.37	3	.06	ACE-ACE
AE–CE	.42		.90			.39		.48	.86	2128.17	4	0	ACE-ACE
CE–AE		.36	.92			.40	.53		.83	2131.35	4	0	ACE-ACE
E–E			1.00			.39			1.00	2181.58	6	0	ACE-ACE

TABLE 12

Bivariate Correlated Factors Results, World Danger and Approval of Iraq War

	Correlated Factors Path Estimates									Comparative Fit Statistics			
Model	Ha	Ca	Ea	Ra	Rc	Re	Hb	Cb	Eb	–2LL	Δdf	*p*-value	Comp. Model
ACE–ACE	.55	.18	.82	.43	1.00	.18	.61	.27	.74	2124.47			
AE–ACE	**.58**		**.81**	**.50**		**.18**	**.67**	**.00**	**.74**	**2124.9**	**2**	**.81**	**ACE-ACE**
CE–ACE		.52	.86		1.00	.21	.58	.33	.75	2130.33	2	.05	ACE-ACE
ACE–AE	**.58**	**0.00**	**.81**	**.50**		**.18**	**.67**		**.74**	**2124.9**	**2**	**.81**	**ACE-ACE**
ACE–CE	.50	.28	.82		1.00	.21		.61	.79	2132.61	2	.02	ACE-ACE
AE–AE	**.58**		**.81**	**.50**		**.18**	**.67**		**.74**	**2124.9**	**3**	**.94**	**ACE-ACE**
CE–CE		.52	.86		.55	.19		.61	.79	2138.61	3	0	ACE-ACE
AE–CE	.51		.85			.32		.55	.82	2164.68	4	0	ACE-ACE
CE–AE		.44	.89			.33	.62		.77	2162.14	4	0	ACE-ACE
E–E			1.00			.30			1.00	2260.06	6	0	ACE-ACE

TABLE 13

Bivariate Correlated Factors Results, World Danger and Approval of Military Spending

	Correlated Factors Path Estimates									Comparative Fit Statistics			
Model	Ha	Ca	Ea	Ra	Rc	Re	Hb	Cb	Eb	–2LL	Δdf	*p*-value	Comp. Model
ACE–ACE	.58	.05	.81	.63	1.00	.23	.55	.33	.77	2094.25			
AE–ACE	**.58**		**.81**	**.67**		**.22**	**.56**	**.30**	**.77**	**2094.31**	**2**	**.97**	**ACE-ACE**
CE–ACE		.52	.86		.81	.27	.46	.43	.78	2101.47	2	.03	ACE-ACE
ACE–AE	.58	0.00	.81	.57		.23	.64		.76	2095.02	2	.68	ACE-ACE
ACE–CE	.48	.30	.82		1.00	.27		.59	.81	2100.05	2	.06	ACE-ACE
AE–AE	**.58**		**.81**	**.57**		**.23**	**.64**		**.76**	**2095.02**	**3**	**.86**	**ACE-ACE**
CE–CE		.52	.86		.60	.26		.59	.81	2104.24	3	.02	ACE-ACE
AE–CE	.48		.87			.39		.50	.85	2134.19	4	0	ACE-ACE
CE–AE		.42	.90			.39	.56		.82	2135.84	4	0	ACE-ACE
E–E			1.00			.36			1.00	2211.44	6	0	ACE-ACE

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

TABLE 14

Bivariate Correlated Factors Results, World Danger and Use of Force in Foreign Policy

	Correlated Factors Path Estimates									Comparative Fit Statistics			
Model	Ha	Ca	Ea	Ra	Rc	Re	Hb	Cb	Eb	–2LL	Δdf	*p*-value	Comp. Model
Model	Ha	Ca	Ea	*Ra*	*Rc*	*Re*	Hb	Cb	Eb	–2LL	df	*p*-value	Comp. Model
ACE–ACE	.57	-.06	.82	.94	1.00	.03	.57	.09	.82	2139.2			
AE–ACE	**.58**		**.82**	**.90**		**.03**	**.57**	**.06**	**.82**	**2139.22**	**2**	**.99**	**ACE-ACE**
CE–ACE		-.52	.85		-1.00	.11	.31	.45	.84	2152.56	2	0	ACE-ACE
ACE–AE	**.58**	**0.00**	**.82**	**.90**		**.03**	**.58**		**.82**	**2139.22**	**2**	**.99**	**ACE-ACE**
ACE–CE	.31	.45	.84		1.00	.12		.52	.85	2152.35	2	0	ACE-ACE
AE–AE	**.58**		**.82**	**.90**		**.03**	**.58**		**.82**	**2139.22**	**3**	**1**	**ACE-ACE**
CE–CE		.52	.86		.90	.11		.52	.86	2154.08	3	0	ACE-ACE
AE–CE	.46		.88			.30		.40	.91	2215.36	4	0	ACE-ACE
CE–AE		.40	.91			.30	.46		.88	2215.78	4	0	ACE-ACE
E–E			1.00			.32			1.00	2249.79	6	0	ACE-ACE

Note: A=Additive Genetic Effect, C=Common Environment Effect, E=Unique Environment Effect, –2LL= –2*log (likelihood ratio of H1/H0), df=degrees of freedom; values in brackets are 95% confidence intervals; bolding = preferred model..

mental) for both positions (Tables 11 to 14). Along with a fully saturated ACE–ACE model, as illustrated above, we present more parsimonious submodels, and where they are the preferred model, we present them in bold.

Additive genetic factors and individual environmental factors, for both the respondent's sense of world danger and hawkish national security, are correlated. However, for the correlations between the respondents' worldviews and their specific policy position attitudes, the covariance associated with the genetic factors is greater than that of the environmental factors. The correlation between genetic variance on worldview and policy position is between 50% and 100%, whereas the environmental sources of attitudinal correlations never appear to account for more than 25% of the variance in an individuals' responses. In most cases, submodels that restrict estimation of the variance associated with common environmental factors to zero provide the best fit. It appears that similar genetic factors drive both general and specific foreign policy views, but individual environmental exposure affects each in a distinct way.

Discussion

These results suggest that the political communication story of the manipulation of fear leading to attitude change is likely more complex than previously thought. The additive genetic components of individuals' responses to the policy questions are highly correlated with the corresponding components in the danger question, but the respondents' unique environmental component is not. These results suggest that a respondent's attitudes about danger and aggressive foreign policy are not simply the result of a common, contemporaneous signal, as they would be if the respondents' public policy attitudes were the result of an elite-generated message common to all respondents. Even if the message common to all suggests that the world is dangerous, and that the policies in question will serve to alleviate that danger, the link between a successful priming of the target audience and their change in policy views is nonuniform, shaped by each respondent's genetic makeup.

Our estimates suggest that, although there is a correlation between a person's belief that the world is dangerous and their support for torture, this correlation is the result of a common genetic component in the two variables, *not* a common life experience (with a caveat discussed in more detail below). For example, political elites hoping to promote torture as a policy justified by prompts that provoke individuals' personal security concerns (danger) will not find uniform effects across the population, even if perceptions of danger respond monotonically to the priming. The link between fear and aggressive foreign policy views appears to pass through another trait, some form of general hawkishness or pacifism.

Also of note is the link between perceptions of danger and beliefs about the use of force in foreign policy. One interesting aspect of this question that distinguishes it from the others is that it is about general policy rather than specific policies. Preferences for force over diplomacy are at the core of hawkish sentiments. Findings on this question more directly reflect ideological beliefs, which have been shown in other work to be influenced by genetics. A common argument in the existing literature on hawkishness and priming is that the public somewhat uniformly responds in predictable ways to messages of danger or threat. The findings above suggest otherwise (see also Hetherington & Suhay, 2011).

Limitations

Our data are not time-series panel observations; therefore, we do not observe any temporal change, either in the environment that might affect underlying views of world danger or in the respondents' attitudes towards

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press

various public policy options. Further, the respondents are mostly white, middle aged (53–63) American citizens, and they all took the survey in 2008–09. It is not unreasonable to assume that most, if not all, received a variety of messages from politicians and from news reports of world events more generally, most prominently 9/11, signaling that the world is a dangerous place. Moreover, many of the signals that all of the respondents presumably received, though in differing frequency and intensity, were explicitly linked to the policies we evaluate. If they all received the same signal, we would not expect to observe any variance in their behavior based on environmental components. However, given some presumed amount of genetic variation within the population from which the sample was drawn, as well as variation in the respondents' upbringings, we would expect to observe variation in responses and correlation between responses in the genetic and common environmental components. Prior to 9/11, the population's attitudes about the world may have looked very different, but underlying differences in how people respond to fear signals would remain.

Acknowledgments

The data for this paper were collected with the financial support of the National Science Foundation (SES-0721378). Data analysis was supported by NSF Grants SES-1047687 and SES-0921008.

References

Abramson, P. R., Aldrich, J. H., Rickershauser, J., & Rohde, D. W. (2007). Fear in the voting booth: The 2004 presidential election. *Political Behavior*, *29,* 197–220.

Alford, J. R., Funk, C. L., & Hibbing, J. R. (2005). Are political orientations genetically transmitted? *American Political Science Review, 99*, 153–167.

Altheide, D. L. (1997). The news media, the problem frame, and the production of fear. *Sociological Quarterly*, *38,* 647–668.

Brader, T. (2005). Striking a responsive chord: How political ads motivate and persuade voters by appealing to emotions. *American Journal of Political Science, 49,* 388–405.

Bush, G. W. (2008, March 8).Text: Bush on veto of intelligence bill. *New York Times.* Retrieved from http://www.nytimes.com/2008/03/08/washington/08cnd-ptext.html?pagewanted=print

DiMaggio, A. R. (2009). When media goes to war: hegemonic discourse, public opinion, and the limits of dissent. U.S.A.: *Monthly Review Press*

Eaves, L. J., & Hatemi, P. K. (2008). Transmission of attitudes toward abortion and gay rights: Effects of genes, social learning and mate selection. *Behavior Genetics, 38,* 247–256.

Fowler, J. H., Baker, L. A., & Dawes, C. T. (2008). Genetic variation in political participation. *American Political Science Review, 102,* 233–248.

Fowler, J. H., & Dawes, C. T. (2008). Two genes predict voter turnout. *The Journal of Politics, 70,* 579–594.

Fowler, J. H., & Schreiber, D. (2008). Biology, politics, and the emerging science of human nature. *Science, 322,* 912.

Gross, K., Brewer, P. R., & Aday, S. (2009). Confidence in government and emotional responses to terrorism after September 11, 2001. *American Politics Research, 37,* 107.

Hatemi, P. (2009). Political preferences, fear, trust, and psychopathologies. *APSA*, Sept, Toronto, Canada.

Hatemi, P. K., Alford, J. R., Hibbing, J. R., Martin, N. G., & Eaves, L. J. (2009). Is there a 'party' in your genes? *Political Research Quarterly, 62,* 584–600.

Hatemi, P. K., Medland, S. E., Morley, K. I., Heath, A. C., & Martin, N. G. (2007). The genetics of voting: An Australian twin study. *Behavior Genetics, 37*, 435–448.

Hetherington, M., & Suhay, E. (2011). Authoritarianism, threat, and Americans' support for the war on terror. *American Journal of Political Science, 55,* 546–560.

Huddy, L., Feldman, S., Taber, C., & Lahav, G. (2005). Threat, anxiety, and support of antiterrorism policies. *American Journal of Political Science, 49,* 593–608.

Jost, J. T., Napier, J. L., Thorisdottir, H., Gosling, S. D., Palfai, T. P., & Ostafin, B. (2007). Are needs to manage uncertainty and threat associated with political conservatism or ideological extremity? *Personality and Social Psychology Bulletin, 33,* 989–1007.

Kendler, K.S., Gardner, C.O., and Lichtenstein P. (2008). A developmental twin study of symptoms of anxiety and depression: Evidence for genetic innovation and attenuation. *Psychological Medicine, 38*, pp 1567-1575

Lerner, J., Gonzalez, R., Small, D., & Fischhoff, B. (2003). Effects of fear and anger on perceived risks of terrorism: A national field experiment. *Psychological Science*, *14,* 144–150.

Loehlin, J. C. (1996). The Cholesky approach: A cautionary note. *Behavior Genetics, 26,* 65–69.

Lupia, A., & Menning, J. O. (2009). When can politicians scare citizens into supporting bad policies? *American Journal of Political Science*, *53,* 90–106.

Martin, N.G., Eaves L.J., Heath A.C., Jardine R., Feingold L.M., Eysenck H.J. (1986) Transmission of social attitudes. *ProcNatl Acad Sci 83,* 4364–4368

McDermott, R., & Hatemi, P. K. (2010). Emerging models of collaboration in political science: Change, benefits and challenges. *PS: Political Science and Politics, 43,* 49–58.

Medland, S. E., & Hatemi, P. K. (2009). Political science, biometric theory, and twin studies: A methodological introduction. *Political Analysis, 17,* 191–214.

Neale M.C., Cardon L.R. (1992). *Methodology for genetic studies of twins and families.* Kluwer Academic Publishers, Dordrecht, The Netherlands.

Oxley, D., Smith, K., Alford, J., Hibbing, M., Miller, J., Scalora, M., Hatemi, P., & Hibbing, J. (2008). Political attitudes vary with physiological traits. *Science, 321,* 1667–1670.

Perrin, A. J. (2005). National threat and political culture: Authoritarianism, antiauthoritarianism, and the September 11 attacks. *Political Psychology, 26,* 167–194.

Robin, C. (2004). *Fear: The history of a political idea.* U.S.A.: Oxford University Press.

Small, D. A., Lerner, J. S., & Fischhoff, B. (2006). Emotion priming and attributions for terrorism: Americans' reactions in a national field experiment. *Political Psychology, 27,* 289–298.

VandeHei, J. (2004, October 7). Bush: Kerry would 'weaken' U.S. *Washington Post,* A01. Retrieved from http://www.washingtonpost.com/ac2/wp-dyn/A10573-2004Oct6?language=printer

Verhulst, B., Hatemi, P. K., & Martin, N. G. (2010). The nature of the relationship between personality traits and political attitudes. *Personality and Individual Differences*, 49, 306–316.

https://doi.org/10.1375/twin.15.1.60 Published online by Cambridge University Press