

“Escape from Freedom”: Authoritarianism-related traits, political ideology,
personality, and belief in free will/determinism.

Thomas H. Costello

Shauna M. Bowes

Emory University, Department of Psychology

Scott O. Lilienfeld

Emory University, Department of Psychology

University of Melbourne, School of Psychological Sciences

This manuscript has been accepted for publication in the *Journal of Research in Personality*. This version is not the copy of record and may not entirely replicate the published document.

Correspondence should be addressed to Thomas H. Costello, 36 Eagle Row, Department of Psychology, Emory University, Atlanta, GA, 30322. E-mail: thcoste@emory.edu.

Abstract

Philosophers have long speculated that authoritarianism and belief in determinism are functionally related. To evaluate this hypothesis, we assessed whether authoritarianism and allied personality and political variables predict varieties of belief in determinism in three community samples ($N_1 = 566$ to $20,010$; $N_2 = 500$; $N_3 = 419$). Authoritarianism and allied variables manifested moderate to large positive correlations with both fatalistic and genetic determinism beliefs. Controlling for political conservatism did not meaningfully attenuate these relations. Further, openness was negatively related to fatalistic determinism beliefs and agreeableness was negatively related to genetic determinism beliefs. Taken together, our findings clarify the nature of relations between authoritarianism and general personality, on the one hand, and free will/determinism beliefs, on the other, and suggest intriguing intersections between worldviews and personality traits.

Keywords: Authoritarianism; determinism; free will; beliefs; epistemic motivations; political ideology; need for closure; social dominance orientation; general personality; cognitive style.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

People differ in their beliefs regarding free will and determinism (Ewusi-Boisvert & Racine, 2018). But we know surprisingly little about how these beliefs relate to, and are potentially shaped by, personality traits, including those lying on the interface between personality and politics. One variable that may be especially relevant in this regard is authoritarianism, which itself bears robust relations to the general personality domain (e.g., Cohrs, Kampfe-Hargrave, & Riemann, 2012; Sibley & Duckitt, 2008). Scholarly recognition of potential links between deterministic beliefs and authoritarian attitudes can be traced to the origins of modern social science. Fromm (1941), a pioneering scholar of the psychology of totalitarianism, posited that individuals seek to “escape from freedom” via authoritarianism in times of uncertainty and threat. Similarly, Adorno and colleagues’ *The Authoritarian Personality* (1950) highlighted belief in fate, a variant of determinism, as one of 9 personality facets underlying susceptibility to fascist ideology. History offers at least some indirect support for these contentions, albeit at the level of broader societies rather than personality dispositions—Nazi Germany and the Stalinist Soviet Union, two prototypically totalitarian regimes, leveraged the philosophical concepts of genetic determinism and dialectical/historical materialism, respectively, to champion utopian methods of social engineering that killed millions (Popper, 1957/2013). Recent years have borne witness to several scientific investigations of the relations between the deterministic belief that genetic and/or social factors shape a person’s essential character (i.e., psychological essentialism), on the one hand, and constructs reflecting reverence for hegemony (e.g., right-wing authoritarianism and social-dominance orientation), on the other (Keller, 2005; Rangel & Keller, 2011; Willoughby et al., 2019). Nevertheless, few authors have examined the more basic hypothesis that authoritarianism is related to belief in determinism writ large, the notion that “all events in this world are fixed, or unalterable, or predetermined”

AUTHORITARIANISM AND BELIEF IN DETERMINISM

(Popper, 1991, p. 8). Accordingly, as well as on the basis of evidence that both authoritarianism and belief in determinism are associated with epistemic needs for certainty and structure (e.g., Duckitt & Sibley, 2010; Jost, 2017; Rangel & Keller, 2011), we tested this hypothesis in three cross-sectional studies, examining relations between multifarious determinism beliefs and authoritarianism-related traits, beliefs, and epistemic motivations¹.

Authoritarianism and Social Dominance Orientation

The psychological construct of authoritarianism arose from early efforts to account for the virulent spread of fascism in the years preceding World War II. Chief among these efforts was *The Authoritarian Personality* (Adorno et al., 1950), now considered one of the most influential texts in the history of social science, which introduced and sought to describe a personality syndrome that disposed individuals to adopt fascist political attitudes. Adorno and colleagues (1950) posited that the primary attributes of the authoritarian personality were obsequiousness to authority figures and dominance towards subordinates, a superficially paradoxical pair of traits amounting to strict adherence to hierarchy².

The Authoritarian Personality also introduced the F Scale, a psychometrically problematic self-report measure of authoritarianism that has seen extensive criticism in the research literature and led *The Authoritarian Personality* to be called by one author “the most deeply flawed work of prominence in political psychology” (Martin, 2001, p. 1). Perhaps as a consequence, numerous revisions of the construct and associated measures have been advanced

¹ Predictions were not pre-registered. Raw data from Study 1, which we do not have permission to post publicly, should be requested from webmaster@yourmorals.org. Raw data from Study 2 and Study 3 are available in an online repository accompanying the article. Author contributions are as follows: Author 1: Conceptualization, Investigation, Data curation, Formal analysis, Writing - original draft, Writing - review & editing. Author 2: Analytical consultation; Writing - review & editing. Author 3: Conceptualization, Investigation, Supervision, Writing - review & editing.

² This initial conceptualization of the authoritarian personality also comprised several characteristics colored by deterministic sentiments, including *superstition and stereotypy*, a coherent trait that purportedly comprises (a) belief in mystical determinants of the individual's fate and (b) proclivities for simplistic, categorical thinking.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

in the last seven decades. For instance, Rokeach (1960) rejected Adorno and colleagues' (1950) contention that authoritarianism is specific to political conservatives, instead conceptualizing the authoritarian personality as an identifiable species of general cognitive rigidity that lists towards absolutism and authoritarianism in the face of ideological threat, which he termed *dogmatism*. Altemeyer (1981, 1988, 1996) later introduced an alternative reconceptualization of authoritarianism that sought to achieve much the opposite, emphasizing the role of social conservatism in authoritarianism and narrowing the construct, which he termed *right-wing authoritarianism* (RWA). Altemeyer conceptualized RWA as comprising three intercorrelated but distinguishable elements: obsequiousness to authority (i.e., *authoritarian submission*), aggression towards outgroup members (i.e., *authoritarian aggression*), and strict adherence to a set of socially conservative norms (i.e., *conventionalism*). Altemeyer's *Right-wing Authoritarianism Scale* has since been linked to hundreds of psychosocial constructs across a large breadth of samples, suggesting that RWA constitutes a stable pattern of individual differences that includes generalized prejudice, ethnocentrism, socially conservative political ideology, and a preference for rigid laws and punitive social control (e.g., Altemeyer, 1996, 2007; Duckitt, 2009).

Modifying and extending Altemeyer's conceptualization, Duckitt et al. (2010) recently contended that authoritarian submission, authoritarian aggression, and conventionalism are not personality traits per se but oblique social-attitudinal dimensions that (a) can be parsed factor-analytically (Duckitt & Bizumic, 2013), (b) manifest differing relations with numerous external criteria (e.g., Liu, Ludeke, & Zettler, 2017; Ludeke, Klitgaard, & Vitriol, 2018), and (c) broadly capture a preference for the subordination of individual autonomy to collective authority. Duckitt and colleagues' (2010) *Authoritarianism, Conventionalism, Traditionalism* (ACT) scales, which

AUTHORITARIANISM AND BELIEF IN DETERMINISM

reflect this multidimensionality, are sometimes used in lieu of the RWA Scale. Still other perspectives construe authoritarianism as predispositional intolerance of difference and/or need for social uniformity that manifests in response to disruptions of societal norms (e.g., Stenner, 2009). A growing number of researchers have employed a 4-item measure of authoritarian parenting values, rooted in this latter conceptualization, in lieu of the RWA Scale or ACT scales to avoid issues of partisan bias (Feldman & Stenner, 1997). As no one account has definitively prevailed, we remain theoretically agnostic in the current investigation.

Moreover, all of the aforementioned measures and conceptualizations largely elide power- and dominance-related features of authoritarianism, which Adorno and colleagues (1950) considered central to the construct. Rather, elements of such “authoritarian dominance” are commonly described within a neighboring construct, *Social Dominance Orientation* (SDO), a motivational preference for group-based stratification in social systems and dominance over lower-status groups (Ho et al., 2015). Together, measures of RWA and SDO account for more variance in relevant external criteria (e.g., ethnic prejudice, nationalism) than either alone (Altemeyer, 1998; Duckitt, 2001; Ekehammar, Akrami, Gylje, & Zakrisson, 2004; Meeusen & Dhont, 2015). Nevertheless, the two constructs also diverge in their relations with numerous political and intergroup attitudes: RWA preferentially predicts homophobia, religiosity, ethnic prejudice, and social conservatism (Altemeyer, 1998), whereas SDO preferentially predicts prejudice towards low-status groups, opposition to animal rights, and economic conservatism (Sidanius et al., 2016). In terms of the familiar Big Five framework, RWA is tied to low Openness and, to a lesser extent, high Conscientiousness (i.e., a combination sometimes termed social conformity), whereas SDO is tied to low Agreeableness (Sibley & Duckitt, 2008). RWA and SDO have also been described in terms of motivational goals and values, with RWA

AUTHORITARIANISM AND BELIEF IN DETERMINISM

potentially reflecting belief in a dangerous world and SDO potentially reflecting belief in a competitive, callous, and cut-throat world (Ho et al., 2015; Sibley & Duckitt, 2010).

Free Will and Determinism Beliefs

The most commonly used conceptualization of free will and determinism beliefs is a quadripartite model comprising the largely orthogonal belief dimensions of *Free Will*, *Fatalistic Determinism*, *Scientific Determinism*, and *Unpredictability*. This model emerged from Paulhus and Carey's (2011) construction and psychometric investigation of two self-report measures: the *Free Will and Determinism-Plus* (FAD+) and its predecessor, the *Free Will and Determinism-4* (FAD-4). In this model, free will entails beliefs in individual autonomy and moral responsibility; fatalistic determinism entails beliefs that actions and events are attributable to “destiny” or “fate”; scientific determinism entails beliefs that actions and events are attributable to material causes outside of the self; and unpredictability entails beliefs that entropy, luck, and other forces render the future unpredictable.

Bolstered by the publication of the FAD+, over the last decade, scientists and experimental philosophers have extensively examined the manifold cognitive, behavioral, and neurophysiological processes associated with lay beliefs concerning free will and determinism (see Ewusi-Boisvert & Racine, 2018; Feldman & Prasad-Chandrashekar, 2018). Free will beliefs potentially foster meaning in life, well-being and belongingness, and job satisfaction (e.g., Bergner & Ramon, 2013; Crescioni et al., 2016; Moynihan, Igou, & Van Tilburg, 2017) and potentially protect against antisociality (Martin, Rigoni, & Vohs, 2017; Vohs & Schooler, 2008), uncooperativeness (Protzko, Ouimette, & Schooler, 2015), and low altruism (Baumeister, Masicampo, & DeWall, 2009). Moreover, patterns of free will and determinism beliefs are correlated with many individual difference variables with relatively large effect sizes, including

AUTHORITARIANISM AND BELIEF IN DETERMINISM

binding moral foundations (positively related to belief in both free will and determinism; Carey & Paulhus, 2013), punitive attitudes (positively related to belief in free will; Shariff et al., 2014), and racial prejudice (negatively related to belief in free will; Zhao, Liu, Zhang, Shi, & Huang, 2014).

The evidence for relations between general personality traits and belief in free will and determinism, however, is far less extensive. In a small sample of U.S. undergraduates, Paulhus and Carey (2011) found that fatalistic determinism beliefs were positively correlated with neuroticism (no other statistically significant correlations between the FAD+ determinism dimensions and Big Five traits emerged). Caspar et al. (2017) later administered a French translation of the FAD+ to a larger sample of French undergraduates, again finding that fatalistic determinism and neuroticism were moderately correlated. Kondratowicz-Nowak and Zawadzka (2018) replicated this result using a Polish translation of the FAD+ in an undergraduate sample as well as finding that (a) scientific determinism beliefs were positively related to neuroticism with a small to moderate effect size; (b) fatalistic determinism beliefs were negatively related to openness to experience; and (c) belief in the unpredictability of events was positively correlated with conscientiousness and neuroticism. Outside of these three reports, however, little is known concerning relations between determinism beliefs and personality. Given potential measurement issues with the FAD+ (e.g., Nadelhoffer et al., 2014), outstanding conceptual questions, and a paucity of independent replication efforts, further research on this front is necessary.

Authoritarianism and Determinism Beliefs

Nascent research evidence suggests that authoritarianism is functionally related to preferences for certainty, structure, and safety in one's environment (Chirumbolo, 2002; Crowson, Thoma, & Hestevold, 2005; Duckitt & Sibley, 2010; Jost, 2017; Stenner, 2005). For

AUTHORITARIANISM AND BELIEF IN DETERMINISM

instance, RWA and/or support for a hierarchical social organization seemingly fosters a sense of order and predictability (Kay, Whitson, Gaucher, & Galinsky, 2009; Rutjens, van Harreveld, van der Pligt, Kreemers, & Noordewier, 2013), increases perceptions that the world is understandable (Womick et al., 2019), and bears positive relations with aversion to disorder and randomness (Friesen, Kay, Eibach, & Galinsky, 2014; Mirisola, Rocco, Russo, Spagna, & Vieno, 2014). Broader theory suggests that authoritarianism is one of a constellation of interrelated psychological attributes and evocable states that predict social conservatism by way of their “functional match” (Katz, 1960) with needs for certainty and security. This framework, often called the “rigidity of the right” model, contends that conservatism sates a cognitive-motivational affinity for needs for safety and certainty because, like authoritarianism, it offers a sense of predictability and dependability by way of its support for current social norms and hierarchies (cf. Malka et al., 2017; Zmigrod et al., 2019). As such, determinism beliefs may intersect with RWA and social conservatism in a manner that reflects their shared functional match with epistemic needs for certainty, safety, and order (Keller, 2005; Rangel & Keller, 2011; Rutjens et al., 2013). Burgeoning evidence lends preliminary support to this supposition: RWA is associated with both belief in fatalistic determinism (Carey & Paulhus, 2013) and deterministic elements of psychological essentialism (Rangel & Keller, 2011; Willoughby et al., 2019); attitudes in support of state paternalism are associated with belief in scientific determinism (Hannikainen et al., 2017); and ethnic prejudice is associated with belief in genetic determinism (Zhao et al., 2014).

Overview of the Present Research

We sought to clarify the relations between lay beliefs in determinism and authoritarianism in three community samples. We addressed six primary research questions.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

First, we examined the associations between authoritarianism traits (operationalized with measures of RWA, SDO, authoritarian parenting values, dogmatism, and political intolerance), on the one hand, and beliefs in fatalistic determinism, genetic determinism, environmental determinism, a non-random and predictable world, and the predictability of human behavior, on the other. We hypothesized that authoritarianism traits would be positively related to determinism and allied beliefs. Second, given the reviewed literature, we posited that determinism beliefs would statistically predict several variables imbued with need for certainty, including intolerance of ambiguity, need for closure, and low need for cognition.

Third, we compared the statistical associations between RWA and SDO, on the one hand, and fatalistic determinism and genetic determinism beliefs, on the other. We hypothesized that RWA, which conceptually relates to submission to structure imposed from “on high” (e.g., by God, fate, or other metaphysical causes), would manifest significantly larger positive relations with fatalistic determinism beliefs relative to SDO (Carey & Paulhus, 2013). In contrast, we hypothesized that SDO, which is characterized primarily by support for group-based dominance hierarchies (Ho et al., 2015), would manifest significantly larger positive relations with genetic determinism beliefs relative to RWA (Rangel & Keller, 2011).

Fourth, given (a) the relevance of political ideology to both authoritarianism and determinism beliefs and (b) the possibility of ideological bias in measures of authoritarianism (e.g., Reyna, 2017), we also sought to disentangle authoritarianism from social conservatism by controlling for political ideology in secondary analyses. We generally expected that relations between authoritarianism traits and determinism beliefs would remain the same, or even increase (i.e., due to statistical suppression), when covarying for ideology.

Relatedly, although a growing literature indicates that free will beliefs and global political ideology are moderately positively correlated (Carey & Paulhus, 2013; Clarkson et al., 2015), increasingly robust evidence indicates that right-left political views can be decomposed into separable economic and social content subdimensions (e.g., Feldman & Johnston, 2014). Social conservatism, which chiefly concerns the endorsement of traditional values, social rules, and norms as well as negative attitudes about cultural outsiders and transgressors, consistently manifests associations with variables tied to needs for security and certainty. In contrast, economic conservatism, which chiefly concerns government involvement in private enterprise and/or the economic choices available to its citizens, as well as opposition to redistributive social policies, often manifests null or even negative associations with said variables (Federico & Malka, 2018). One potential explanation for this discrepancy is that both left-wing economic policies and right-wing social policies entail heightened governmental intervention in social and economic affairs, respectively (whereas the opposite is true for left-wing social policies and conservative economic policies), including individual choices, which may be appealing to individuals high in authoritarianism, belief in determinism, and need for certainty. Hence, fifth, we hypothesized that belief in determinism would be positively related to social conservatism and left-wing economic beliefs.

Sixth and finally, given that (a) both RWA and SDO are often characterized in terms of their relations with general personality traits and (b) relations between free will/determinism beliefs and general personality traits have yet to be thoroughly examined, we investigated relations between broadband personality traits and determinism beliefs. Despite the heterogeneity of prior findings, we hypothesized that low openness, which overlaps in some respects with RWA, would predict fatalistic determinism beliefs, whereas low Agreeableness,

which overlaps in some respects with SDO, would predict genetic determinism beliefs. We also conducted examinations of relations between other personality traits and determinism beliefs on an exploratory basis.

Study 1

Methods

Participants. Participants were 20,010 adults (55% female; $M_{\text{age}} = 36.53$, $SD_{\text{age}} = 15.24$) who completed a measure of free will and determinism beliefs on YourMorals.org from 2009 through 2018. YourMorals.org is a data collection platform that allows visitors to complete psychology measures of their choosing and view their scores. Because participants freely select which measures to complete, only a handful of individuals in the full sample completed all measures, resulting in differing sample sizes across external criteria (Ns ranged from 566 to 5,493). Cases with greater than 5% of missing data for the measures they did complete were removed on a listwise basis. The majority of participants ($N = 13,908$) did not disclose their nationality, but those who did were located in over 70 countries. Most were from Western, capitalist countries such as the United States (72.3%), Canada (5.7%), the United Kingdom (5.3%), and Australia (2.4%). A plurality of the participants who provided their level of education had completed a university or professional degree (41.8%). Of those that provided their political identification, the majority identified as either liberal (46.4%) or moderate (40.4%). Race and ethnicity data were not available.

Measures. To assess RWA, we used Zakrisson's (2005) short (15-item; $\alpha = .85$) version of the *RWA Scale* (1 = *strongly disagree* to 6 = *strongly agree*). We used the *SDO₇* (Ho et al., 2015) to assess SDO. The *SDO₇* (1 = *strongly disagree* to 7 = *strongly agree*) comprises two higher-order dimensions: Dominance (8 items, $\alpha = .86$) and Egalitarianism (8 items, $\alpha = .88$).

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Dominance describes a preference for group-based dominance, whereas Egalitarianism describes a dislike of group-based inequality and hierarchy-maintaining social policies. We focus on the former construct in the present work due to the peripheral relevance of Egalitarianism to our hypotheses. Participants also completed the short version of the *Need for Closure Scale—Revised* (NFC; Roets & Van Hiel, 2011), a 15-item ($\alpha = .88$) self-report measure of aversion to ambiguity and preference for concrete information (1 = *strongly disagree* to 6 = *strongly agree*). In addition, participants completed the *Intolerance of Ambiguity Scale* (Budner, 1962), a 16-item ($\alpha = .81$) self-report (1 = *strongly disagree* to 6 = *strongly agree*). Participants also completed the Big Five Inventory (BFI-44; John et al., 2008), a 44-item self-report measure (1 = *disagree strongly* to 5 = *agree strongly*) of the Big Five dimensions that has been widely employed in the literature and demonstrates satisfactory psychometric properties (John & Srivastava, 1999). Political ideology was assessed using Likert-type ratings for global, social, and economic ideology (social-economic $r = .50$), ranging from 1 (*very liberal*) to 7 (*very conservative*).

We employed the *Free Will and Determinism-4* scale (FAD-4; Paulhus & Margesson, 1994) to assess beliefs regarding free will and determinism (1 = *totally disagree* to 5 = *totally agree*). The FAD-4 is an unpublished predecessor to the FAD+, the latter of which was published after data collection on YourMorals.org began. A four-factor interpretation of the FAD-4, roughly matching Paulhus and Carey's (2011) commonly employed four-factor interpretation of the FAD+, has generally demonstrated subscale reliabilities below .60 and high factor cross-loadings. As such, alternative factor interpretations of the FAD-4 may offer increased utility relative to the four-factor model (see also Nadelhoffer et al., 2014).

We conducted an exploratory factor analysis (EFA) of the FAD-4 in the full sample using the *psych* package (Revelle, 2018) in *R*. Both Velicer's MAP criteria (1976) and Horn's parallel

AUTHORITARIANISM AND BELIEF IN DETERMINISM

analysis (1965) suggested a 7-factor solution. We accordingly conducted a principal axis factor analysis with polychoric correlations (Finney & DiStefano, 2013) and promax (oblique) rotation and extracted 7 factors (eigenvalues ranged from 4.19 to 1.04), which collectively accounted for 49% of the total variance (see Table 1 for item content, factor pattern coefficients, and correlations among factors). Variables with structure and pattern coefficients greater than .30 were used to interpret and name the factors (Bandalos & Finney, 2018). Although, as in the original four-factor solution, several high factor cross-loadings were present in the 7-factor solution, the exploratory elimination of poorly functioning variables from the model did not change our conclusions³. As such, all variables were retained for subsequent analyses. The factors were termed: *Fatalistic Determinism* (7 items; $\alpha = .80$), *Random/Unpredictable World* (4 items; $\alpha = .67$), *Human Behavior Predictability* (4 items; $\alpha = .61$), *Moral Responsibility* (5 items; $\alpha = .72$), *Free Will* (3 items; $\alpha = .72$), *Genetic Determinism* (3 items; $\alpha = .51$), and *Chance/Entropy* (2 items; $\alpha = .47$). The internal consistencies of the latter two scales were marginal, owing in part to their small number of items; nevertheless, we elected to retain them given their clear interpretability and relevance to our hypotheses. We considered FAD-4 Fatalistic Determinism, FAD-4 Human Behavior Predictability, and FAD-4 Genetic Determinism to reflect differing beliefs about the certainty of future outcomes (i.e., deterministic beliefs) and focus on these dimensions when presenting results. We considered FAD-4 Random/Unpredictable World to be compatible with, but meaningfully distinct from, determinism beliefs,

³Alternative models that retained six-, five-, and four-factors were also examined. They demonstrated both high cross-loadings and subscale reliabilities below .60. Unlike the seven-factor solution, however, the alternative models did not distinguish between free will and moral responsibility beliefs and/or genetic determinism and environmental determinism beliefs. As such, although factors for which only two items have high factor loadings are less likely to replicate, the two- and three-item factors in our seven-factor solution break apart in a manner that is consistent with our *a priori* expectations, strengthening the likelihood that they represent a separate factor. Further, the MAP procedure and parallel analysis converged in their recommendations and our considerable sample size may mitigate against a non-replicable factor solution. Accordingly, we chose to move forward with the seven-factor interpretation.

as belief that the future is exceedingly difficult to predict or seemingly random neither precludes nor entails determinism. Factor scores were saved using a regression-based method.

Results

Descriptive statistics and correlational results are presented in Table 3. Effect sizes are interpreted according to Gignac and Szodorai's (2016) meta-analytically derived guidelines (small $r = .10$, moderate $r = .20$, large $r = .30$).

Aim 1: Clarifying the associations between authoritarianism traits and determinism beliefs. As predicted, FAD-4 Fatalistic Determinism manifested large positive correlations with the RWA scale and a moderate positive correlation with SDO₇ Dominance. Further in line with our expectations, Genetic Determinism manifested a moderate positive correlation with SDO₇ Dominance; unexpectedly, however, Genetic Determinism was also moderately negatively related to the RWA Scale. A similar pattern was evident for Human Behavior Predictability, which demonstrated a small but positive correlation with SDO₇ Dominance and a moderate negative correlation with the RWA Scale. FAD-4 Random/Unpredictable World and Chance/Entropy were negatively correlated with the RWA Scale with small to moderate effect sizes ($r_s > -.16$). Chance/Entropy was negatively correlated with SDO₇ Dominance, whereas Random/Unpredictable World was not significantly correlated with SDO₇ Dominance. FAD-4 Free Will and Moral Responsibility demonstrated large positive correlations with the RWA Scale, yet Moral Responsibility was also moderately positively correlated with SDO₇ Dominance, whereas Free Will was not.

Aim 2: Clarifying the associations between need for certainty and determinism beliefs. FAD-4 Fatalistic Determinism manifested a small-to-moderate positive correlation with Need for Closure, a small positive correlation with Intolerance of Ambiguity, and a moderate

AUTHORITARIANISM AND BELIEF IN DETERMINISM

negative correlation with Need for Cognition. Neither Genetic Determinism nor Human Behavior Predictability manifested significant relations with Need for Closure, Need for Cognition, and Intolerance of Ambiguity. Chance/Entropy was negatively correlated with Need for Closure and Intolerance of Ambiguity and positively correlated with Need for Cognition. In contrast, Random/Unpredictable World was negatively correlated with Need for Cognition and was otherwise not significantly correlated with need for certainty criteria. FAD-4 Free Will and Moral Responsibility demonstrated large positive correlations with Intolerance of Ambiguity and moderate positive correlations with Need for Closure.

Aim 3: RWA vs. SDO. We predicted that RWA would be more robustly related to fatalistic determinism and SDO would be more robustly related to genetic determinism. Of the statistically significant zero-order correlations, the RWA scale's relation with FAD-4 Fatalistic Determinism was indeed larger than SDO₇ Dominance's relation with Fatalistic Determinism (Steiger's $Z = 3.65$, $p < .001$, $df = 433$) and SDO₇ Dominance's positive relation with Genetic Determinism significantly differed from the RWA scale's negative relation (Steiger's $Z = 10.05$, $p < .001$, $df = 433$). Similarly, Human Behavior Predictability's positive relation with SDO₇ Dominance differed significantly from its negative relation with the RWA Scale (Steiger's $Z = 7.00$, $p < .001$, $df = 433$).

Aim 4: Political ideology. Controlling for global political ideology produced statistically significant changes for 30 of the 35 results, per the bootstrapping method (see Hayes, 2009). See Table 3 for partial correlations; full results are presented in Table S4. The magnitudes of these changes were generally negligible (i.e., $ab_{\text{completely standardized}} < |.05|$), with several notable exceptions. For instance, the negative relation between Genetic Determinism and the RWA Scale was reduced to non-significance ($\beta = -.03$, $ab_{cs} = -.16$, 95% CI [-.22, -.10]) and the positive relation

AUTHORITARIANISM AND BELIEF IN DETERMINISM

between Genetic Determinism and SDO₇ Dominance become considerably larger ($\beta = .42$, $ab_{cs} = -.18$, 95% CI [-.23, -.13]). Relations for Fatalistic Determinism differed only slightly for all variables (e.g., RWA: $\beta = .35$, $ab_{cs} = -.07$, 95% CI [-.12, -.01]), whereas Human Behavior Predictability's significant negative relation with RWA became non-significant ($\beta = -.04$, $ab_{cs} = -.19$, 95% CI [-.24, -.13]) and its non-significant relation with SDO₇ Dominance became positive and significant ($\beta = .30$, $ab_{cs} = -.18$, 95% CI [-.23, -.13]). Further, Free Will and Moral Responsibility's large positive relations with RWA were reduced to non-significance ($\beta = .06$, $ab_{cs} = .26$, 95% CI [.20, .32] and $\beta = .07$, $ab_{cs} = .31$, 95% CI [.25, .37], respectively). Free Will's non-significant relation with SDO₇ Dominance became negative and significant ($\beta = -.23$, $ab_{cs} = .19$, 95% CI [.15, .25]); similarly, Moral Responsibility's positive relation with SDO₇ Dominance became negative and significant ($\beta = -.10$, $ab_{cs} = .25$, 95% CI [.20, .30]).

Aim 5: Social vs. economic conservatism. Social conservatism manifested positive correlations with Fatalistic Determinism, Free Will, and Moral Responsibility (r s from .27 to .42), and negative correlations with all other FAD-4 dimensions (r s from -.26 to -.09). The pattern of relations for economic conservatism was largely the same, with the exception of Fatalistic Determinism, which manifested only a negligible, albeit significant, relation with economic conservatism. Tests of the distance between dependent correlations also revealed statistically significant differences across social conservatism and economic conservatism for FAD-4 Fatalistic Determinism (Steiger's $Z = 14.51$, $p < .001$), Genetic Determinism (Steiger's $Z = 2.91$, $p < .001$), Chance/Uncertainty (Steiger's $Z = 9.22$, $p < .001$), Moral Responsibility (Steiger's $Z = 4.91$, $p < .001$), and Free Will (Steiger's $Z = 3.75$, $p < .001$).

Aim 6: Clarifying the associations between general personality and determinism beliefs. FAD-4 Fatalistic Determinism manifested a small positive correlations with Neuroticism

AUTHORITARIANISM AND BELIEF IN DETERMINISM

and a small negative correlation with Openness. Genetic Determinism manifested a moderate negative correlation with Agreeableness. Exploratory analyses also revealed small positive associations between Genetic Determinism and both Openness and Neuroticism ($r_s < .10$) as well as small to moderate negative associations between Genetic Determinism and both Conscientiousness and Extraversion ($r_s > -.15$). A similar pattern was evident for Human Behavior Predictability, which demonstrated a small but positive correlation with Neuroticism and small-to-moderate negative correlations with Agreeableness, Conscientiousness, and Extraversion (r_s from $-.13$ to $-.07$). Chance/Entropy was negatively correlated with Neuroticism and positively correlated with Openness, Agreeableness, Conscientiousness, and Extraversion (r_s ranged from $.05$ to $.17$), all of which is broadly consistent with prediction. In contrast, Random/Unpredictable World was negatively correlated Agreeableness, Conscientiousness, and Extraversion (r_s from $-.19$ to $-.06$). FAD-4 Free Will and Moral Responsibility manifested positive correlations with Conscientiousness and Extraversion (r_s from $.05$ to $.24$) and negative correlations with Openness and Neuroticism (r_s from $-.17$ to $-.09$).

Study 1 Discussion

Results generally supported our expectation that authoritarianism traits are tied to beliefs about the certainty of the future, with effect sizes for most predicted relations falling within the range of $r_s = .15$ to $.35$. Controlling for political conservatism often either increased the magnitude of authoritarianism-determinism relations or reduced negative relations to zero, suggesting that authoritarianism, rather than political conservatism per se, best predicts belief in determinism. Relations between need for closure and need for cognition, on the one hand, and determinism beliefs, on the other, also generally conformed to our expectations, albeit less extensively and with smaller effect sizes than predicted.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

RWA and SDO also differed in their relations with determinism beliefs. RWA was positively related to belief in fatalistic determinism but negatively related to belief in genetic determinism; in contrast, SDO's dominance facet was positively related to both belief in fatalistic determinism and belief in genetic determinism. Moreover, the differences across RWA and SDO's relations with fatalistic determinism and genetic determinism were statistically significant and in the predicted directions (i.e., RWA more related to fatalistic determinism than SDO and SDO positively related to genetic determinism, whereas RWA was negatively related).

Although relations across social and economic conservatism differed statistically at the zero-order level for several FAD-4 factors (see also online supplementary materials and Table S1), the magnitude of these differences were fairly negligible relative to our anticipated effect sizes with the lone exception of fatalistic determinism, which manifested a moderate-to-large association with social conservatism but a marginal association with economic conservatism, lending partial support to our hypothesis that social but not economic conservatism would be positively related to determinism beliefs.

Lastly, findings for personality were statistically significant and in predicted directions, with openness manifesting a negative relation with fatalistic determinism and agreeableness manifesting a negative relation with genetic determinism. Still, because the effect sizes were relatively small, these results may be of more theoretical than practical significance.

Study 2

We conducted Study 2 to replicate Study 1's results in a different population and extend them to additional authoritarianism-related variables, including dogmatism and political intolerance. Study 2 also allowed for the use of more comprehensive assessments of authoritarianism, determinism beliefs, political ideology, and general personality.

Method

Participants ($N = 500$; $M_{\text{age}} = 41.1$, $SD_{\text{age}} = 12.6$) were United States community members recruited from Amazon's Mechanical Turk (MTurk), an online marketplace for crowdsourced labor. Previous investigations have suggested that Mturk is an adequate source of self-report data for psychological research, providing data that are largely of equal quality than those provided by undergraduate samples (Buhrmester, Kwang, & Gosling, 2011; Miller et al., 2017; see also Coppock, 2018). Participants were paid \$5.00 for an average of 45 minutes work. Those who failed more than one of three attention check items (e.g., answering other than "agree" to an item stating "The sky is often blue") were removed, resulting in a final sample size of 479. Most participants were female (53.0%) and white (85.5%). The remainder of the sample primarily comprised African Americans (8.0%), Hispanic/Latinx-Americans (6.9%), and Asian-Americans (2.8%). The plurality of participants were Democrats (42.7%), with fewer belonging to the Republican Party (27.0%) and others identifying as independents (24.7%).

Measures. Three widely-used measures of RWA were administered: the *Authoritarianism, Conservatism, and Traditionalism* (ACT; Duckitt et al., 2010) scales, the 22-item *Right-wing Authoritarianism Scale* (RWA; Altemeyer, 1996; $\alpha = .88$; -4 = *very strongly disagree* to 4 = *very strongly agree*), and a 4-item forced-choice measure of authoritarian child-rearing values (Feldman & Stenner, 1997; $\alpha = .67$). The ACT (1 = *strongly disagree* to 7 = *strongly agree*) is 36-item self-report measure that conceptualizes RWA as comprising multiple attitude dimensions: ACT Authoritarianism (12 items; $\alpha = .89$), which is largely the motivational goal of maintaining coercive social control; ACT Conservatism (12 items; $\alpha = .92$), which is the motivational goal of maintaining the existing social status-quo; and ACT Traditionalism (12 items; $\alpha = .87$), which is a preference for traditional values. Although correlations among the

AUTHORITARIANISM AND BELIEF IN DETERMINISM

authoritarianism scales were high (r s from .48 to .75), we opted not to combine them into a single indicator due to their conceptual and empirical heterogeneity.

We again used the *SDO₇ scale* (Ho et al., 2015), which comprises the subscales SDO₇ Dominance (8 items, $\alpha = .83$) and SDO₇ Anti-egalitarianism (8 items, $\alpha = .88$). To assess NFC, we again administered the short form of the *Need for Closure Scale—Revised* (Roets & Van Hiel, 2011; $\alpha = .92$). Further, to assess dogmatism, we administered the *DOG Scale* (Altemeyer, 1996; $\alpha = .92$), a 20-item measure of unjustified belief certainty (-4 = *very strongly disagree* to 4 = *very strongly agree*).

To assess political intolerance, parallel right- and left-wing versions of intolerance items were administered to participants, following procedures from previous research (e.g., Crawford & Pilanski, 2014). Participants who identified as left-leaning were asked about whether various right-wing groups (e.g., a pro-life advocacy group) should be allowed to organize, influence government policy, and distribute politicized literature to the public, whereas right-leaning participants were asked to do the same for various left-wing groups (e.g., a pro-choice advocacy group). Participants responded on a 4-point, *True to False* Likert scale. The 6 items were averaged to yield a composite political intolerance score. An independent samples t-test showed that left-leaning participants ($N = 256$; $M = 11.90$, $SD = 4.38$) did not significantly differ from right-leaning participants ($N = 179$; $M = 12.26$, $SD = 4.58$), $t = 0.83$, $p = .405$, so their scores were combined ($\alpha = .77$).

Participants also completed the HEXACO Personality Inventory (HEXACO; Lee & Ashton, 2018), a widely-used 100-item measure of dimensional personality (1 = *strongly disagree* to 5 = *strongly agree*) that consists of 6 factors: Honesty-Humility (e.g., “I would never accept a bribe, even if it were very large”), Emotionality (e.g., “I sometimes can’t help worrying

AUTHORITARIANISM AND BELIEF IN DETERMINISM

about little things”), Extraversion (e.g., “In social situations, I’m usually the one who makes the first move”), Agreeableness (e.g., “I rarely hold a grudge, even against people who have badly wronged me”), Conscientiousness (e.g., “I plan ahead and organize things, to avoid scrambling at the last minute”), and Openness to Experience (e.g., “I like people who have unconventional views”). Cronbach’s α s ranged from .79 to .86. Although the latter five HEXACO dimensions correspond broadly to those in the familiar five-factor model of personality, the HEXACO scale assesses variance not shared with the Five Factor Model for numerous outcome variables, including political ideology (Chirumbolo & Leone, 2010; Lee & Ashton, 2018; Zettler, Hilbig, & Haubrich, 2011).

Attitudes and beliefs about politics were assessed using the *Social and Economic Conservatism Scale* (SECS; Everett, 2013), a survey of favorability toward 12 political topics that are important to conservative voters, of which 6 are economic (e.g., limited government) and 6 are social (e.g., traditional values). Participants use feeling thermometers (0 to 100) to denote their agreement. The SECS yields two oblique dimensions ($r = .53$), economic conservatism ($\alpha = .94$) and social conservatism ($\alpha = .85$). Global political ideology was also assessed using a Likert-type rating for symbolic identity, ranging from 1 (*very liberal*) to 7 (*very conservative*).

Finally, we administered the *FAD+* (Paulhus & Carey, 2011), a 27-item self-report instrument (1 = *totally disagree* to 5 = *totally agree*) that ostensibly comprises the four previously discussed belief factors (i.e., Free Will, Scientific Determinism, Fatalistic Determinism, and Unpredictability), to measure lay beliefs in determinism. Although the four-factor model is commonly observed in the literature, it also has noteworthy limitations; for instance, Paulhus and Carey (2011) tested the four-factor model via confirmatory factor analysis (CFA) in only two relatively small, homogeneous samples ($Ns = 177$ and 203), and results

indicated only modest fit (CFIs = .82 and .84); alternative solutions were not reported. Moreover, although the FAD+ items provide sufficient content coverage to discriminate environmental from genetic determinism beliefs, which have been shown to manifest differential relations with external criteria (e.g., Willoughby et al., 2018), the four-factor model reduces the two content domains into a single factor.

Clarifying the dimensionality of the FAD+. Given that the structural validity of the FAD+ is not well established, we opted to use CFA to compare the four correlated factor model of the FAD+ with a measurement model that closely approximates the seven correlated factor model from our EFA of the FAD-4 in Study 1. Although the seven-factor interpretation could not be precisely recreated using the FAD+ due to differences in item content across the two versions, we constructed a closely approximated version (16/27 items are shared across the FAD-4 and FAD+ and many others are nearly identical). We did not include a Chance/Entropy factor, given the factor's conceptual overlap with Random/Unpredictable World; further, we added an Environmental Determinism factor. Hence, the FAD+ seven-factor model comprised the following factors: *Free Will, Moral Responsibility, Genetic Determinism, Environmental Determinism, Fatalistic Determinism, Human Behavior Unpredictability, and Random/Unpredictable World*. We conducted all analyses in *R* using the *lavaan* package (Rosseel, 2012), using the robust weighted least squares estimator given its capacity to handle categorical indicators.

We first tested a model allowing for four correlated factors corresponding to Carey and Paulhus' (2011) measurement model, which fit the data poorly ($\chi^2 = 8924.01$, $df = 318$, $p < .001$; RMSEA = .06; CFI = .90; TLI = .89; SRMR = .08). Model fit of the seven-factor model was also initially poor ($\chi^2 = 854.68$, $df = 303$, $p < .001$; RMSEA = .06; CFI = .91; TLI = .89; SRMR = .08).

Notably, however, the latent correlation between FAD+ Random/Unpredictable World and FAD+ Human Behavior Unpredictability was greater than 1, indicating that the corresponding factors are not statistically distinguishable. Given this redundancy, we next tested a six-factor model that collapsed them into one factor⁴, termed *Chance and Unpredictability*, which resulted in improved model fit ($X^2 = 396.22$, $df = 237$, $p < .001$; RMSEA = .04; CFI = .97; TLI = .97; SRMR = .06). We elected to move forward with the six-factor interpretation given its superior fit, similarity to our initial solution, and conceptual clarity. Item content, loadings, construct replicabilities (H), and factor correlations are presented in Table 3. Factor scores were saved using a regression-based method for use in subsequent analyses.

Results

Descriptive statistics and correlations are reported in Table 6. We again interpret effect sizes according to Gignac and Szodorai's (2016) meta-analytically derived guidelines (small $r = .10$, moderate $r = .20$, large $r = .30$).

Aim 1: Clarifying the associations between authoritarianism traits and determinism beliefs. As expected, FAD+ Fatalistic Determinism manifested large positive correlations with all five indicators of RWA (r s from .25 to .39) and a moderate positive correlation with SDO₇ Dominance. Quite similarly, Genetic Determinism manifested moderate positive correlations with all indicators of RWA and SDO₇ Dominance (r s ranged from .15 to .24) and a small to moderate positive correlation with Political Intolerance. In contrast to the other varieties of determinism beliefs, Environmental Determinism was not significantly related to authoritarianism traits. Chance/Unpredictability was moderately positively related to Political Intolerance. Finally, both Free Will and Moral Responsibility manifested moderate to large correlations with all measures of RWA (r s from .18 to .38).

⁴Items 7 and 27 were excluded at this stage due to their statistically non-significant loadings in previous models.

Aim 2: Clarifying the associations between need for certainty and determinism

beliefs. As predicted, FAD+ Fatalistic Determinism manifested a large positive correlation with Need for Closure and a moderate positive correlation with the DOG Scale. Genetic Determinism manifested a large positive correlation only with Need for Closure. Environmental Determinism and Chance/Unpredictability were significantly related to Need for Closure with moderately sized positive effects. Finally, neither Free Will nor Moral Responsibility were significantly related to the Dog Scale or Need for Closure.

Aim 3: RWA vs. SDO. The RWA Scale manifested a larger correlation with FAD+ Fatalistic Determinism than did SDO₇ Dominance (Steiger's $Z = 3.52$, $p < .001$, $df = 476$), but all other comparisons across authoritarianism variables and SDO₇ Dominance were not statistically significant at the $p < .01$ level. Similarly, all RWA variables' relation to Genetic Determinism did not statistically differ from SDO₇ Dominance's relation to Genetic Determinism.

Aim 4: Controlling for political ideology. Partial correlations are presented in Table 6 and bootstrapped mediational results are presented in Table S3. After controlling for global political ideology, relations between external criteria (excepting general personality traits, which were not tested) and the three FAD+ determinism beliefs factors generally remained statistically unchanged (34/36). In contrast, relations between the same external criteria, on the one hand, and FAD+ Chance/Uncertainty, Free Will, and Moral Responsibility showed much the opposite pattern of relations, with only 2 of the other 36 relations being statistically unchanged after controlling for political ideology. Relations between Chance/Uncertainty and external criteria became more positive (average $ab_{cs} = -.08$), whereas relations for Free Will (average $ab_{cs} = .11$) and Moral Responsibility (average $ab_{cs} = .10$) were reduced, often to the point of non-significance.

Aim 5: Social vs. economic conservatism. Social conservatism was positively related to Fatalistic Determinism, Genetic Determinism, Free Will, and Moral Responsibility (r s from .15 to .34). Economic conservatism was negatively related to Chance/Uncertainty and positively related to Free Will and Moral Responsibility but was not significantly related to determinism beliefs. Tests of dependent correlations revealed statistically significant differences across SECS Social Conservatism and SECS Economic Conservatism for FAD+ Fatalistic Determinism, FAD+ Genetic Determinism, and FAD+ Chance and Unpredictability (Steiger's Z s from 6.39 to 3.17, p s < .001).

Aim 6: Clarifying the associations between general personality and determinism beliefs. Fatalistic Determinism was positively related to HEXACO Emotionality with a moderate effect size, was negatively related to Honesty-Humility with a small effect size, and was negatively related to Openness, Conscientiousness, and Extraversion with large effect sizes (r s from -.27 to -.23). Genetic Determinism manifested a small to moderate positive correlation with Emotionality and moderate negative relations with Agreeableness, Openness, Honesty-Humility, Extraversion, and Conscientiousness (r s from -.24 to -.19). Environmental Determinism was significantly related to Agreeableness, Honesty-Humility, and Conscientiousness (r s from -.14 to -.13). Chance/Unpredictability was moderately positively related to Emotionality and moderately negatively related to Agreeableness, Extraversion, Honesty-Humility, and Conscientiousness (r s from -.21 to -.13). Finally, both Free Will and Moral Responsibility manifested moderate to large correlations with Agreeableness, Extraversion, and Conscientiousness (r s from .18 to .38).

Discussion

Results from Study 2 replicated Study 1's findings for many of our primary hypotheses, but also differed in a number of important areas. On the former front, authoritarianism-related

AUTHORITARIANISM AND BELIEF IN DETERMINISM

variables manifested moderate to large correlations with various forms of belief in determinism; RWA was a better predictor of fatalistic determinism beliefs than was SDO; need for certainty variables predicted various forms of belief in determinism; and controlling for political conservatism either did not significantly reduce or significantly increased positive relations between authoritarianism variables and belief in determinism⁵. On the latter front, however, RWA manifested a positive association with genetic determinism beliefs, whereas there was a negative association in Study 1; and, likely as a consequence, the positive relation between SDO and genetic determinism was *not* significantly larger than that for RWA, whereas it was in Study 1. Moreover, differences across social and economic conservatism's relations with determinism beliefs were more pronounced in Study 2. In line with our prediction, economic conservatism was not significantly related to belief in determinism, whereas social conservatism was. Relations between general personality and determinism beliefs also differed from Study 1 in notable ways, with openness being negatively related to both fatalistic and genetic determinism beliefs in Study 2, rather than only fatalistic determinism as in Study 1, and conscientiousness being negatively related to both fatalistic and genetic determinism, rather than solely genetic determinism. Agreeableness remained negatively related to genetic determinism, consistent with potentially close links between SDO and genetic determinism. For all personality variables, effect sizes were considerably larger in Study 2 than Study 1.

Study 3

Given these promising but at times mixed results across Studies 1 and 2 and our need to better clarify the structural validity of the 6-factor interpretation of the FAD+, we conducted secondary analyses of a third dataset that includes the FAD+, ACT, and HEXACO scales, as

⁵ In Study 1, significant negative relations between Genetic Determinism and Human Behavior Predictability and authoritarianism were reduced to non-significance after controlling for political conservatism, whereas in Study 2 the equivalent factors were positively related to authoritarianism, but relations were not reduced after controlling for conservatism.

well as a number of other self-report measures. These data were collected from an online community sample by [ANONYMIZED] in 2018 and have been utilized in a peer-reviewed publication once previously (i.e., [ANONYMIZED]); importantly, there was no overlap in the research questions of interest and/or the relations among variables that were analyzed and reported across [ANONYMIZED] and the current study. We were able to further address some but not all of our unresolved research questions, as many but not most variables of interest were included in Study 3 (e.g., measures of social and economic ideology were not administered, and so differences across social and economic conservatism could not be examined).

Method

Participants were 419 MTurk community members (48% female; $M_{age} = 36.7$) from the United States and were largely Caucasian (82.5%), Latinx (8.2%), African American (7.7%), and Asian American (4.6%). Missing data were accounted for using the expectation-maximization algorithm (Enders, 2001) for cases with greater than 95% of data present. Cases in which less than 95% of data were present were excluded on a listwise basis. MTurk workers who had participated in Study 2 were excluded by means of their unique MTurk IDs, to avoid overlap across samples (final $N = 389$).

Measures

As in Study 2, the FAD+, ACT, and HEXACO were employed to assess free will and determinism beliefs, authoritarianism, and general personality traits, respectively. Participants also completed the short-version of Schwartz's Value Survey (SVSS; Lindeman & Verkasalow, 2005), a 10-item measure of 10 motivationally distinct values related to human needs (0 = *opposed to my principles* to 8 = *of supreme importance*). Of these, we judged Power (social power, authority, and wealth), reverse Self-direction (creativity, freedom, curiosity,

independence, choosing one's own goals), and Conformity (obedience, honoring parents and elders, self-discipline, politeness) to be most relevant to authoritarianism on the basis of their similarity to contemporary conceptualizations. Hence, we predicted that these three SVSS values would be positively related to the FAD+ determinism dimensions.

Results

CFA of the FAD+. Following the same procedures that were utilized in Study 2, the 6-factor model of the FAD+ was found to demonstrate excellent fit, $X^2 = 361.66$, $df = 237$, $p < .001$; CFI = 0.98; TLI = 0.97; RMSEA = 0.038, 90% CI [.030, .046], SRMR = .064. Loadings and factor correlations are presented in Table S7. For the sake of comparison, we also estimated the standard 4-factor model of the FAD+, which fit the data less well, $X^2 = 794.40$, $df = 318$, $p < .001$; CFI = 0.92; TLI = 0.92; RMSEA = 0.064, 90% CI [.030, .046], SRMR = .089.

Zero-order correlations. Correlations between the latent FAD+ dimensions and external criteria are detailed in Table 6. FAD+ Fatalistic Determinism manifested large positive correlations with all three ACT dimensions (r s from .32 to .36), moderate positive correlations with SVSS Power and Conformity (r s $< .21$), a moderate to large negative correlation with HEXACO Openness, and large negative correlations with SVSS Self-direction and Conscientiousness (r s $> -.30$). Genetic Determinism manifested moderate positive correlations with ACT Aggression, ACT Conventionalism, and SVSS Power (r s from .19 to .24); a moderate negative correlation with Openness, and large negative correlations with Agreeableness, Honesty-Humility, and Conscientiousness (r s = $-.26$). Environmental Determinism was not significantly related to any outcome variables at the $p < .01$ level. Chance/Unpredictability demonstrated moderate negative relations with Honesty-Humility, Extraversion, and Conscientiousness (r s from $-.19$ to $-.18$). Finally, Free Will and Moral Responsibility manifested

moderate to large positive correlations with all three ACT dimensions, Conscientiousness, and Extraversion (r s from .21 to .31) and moderate negative correlations with SVSS Power (r s > -.21).

Discussion

The findings of Study 3 served as both direct and conceptual replications of results from Studies 1 and 2. Fatalistic and genetic determinism beliefs were positively related to RWA, as well as worldviews broadly associated with authoritarianism (i.e., power, low self-direction, and conformity), suggesting that our theoretical framework offers explanatory power insofar as it generated corroborated predictions. We also replicated relations between free will and determinism beliefs, on the one hand, and the HEXACO general personality dimensions, on the other, finding that low openness, low conscientiousness, low honesty-humility, low agreeableness, and emotionality are tied to determinism beliefs. Moreover, the six-factor interpretation of the FAD+ again exhibited excellent fit, providing further evidence of its superiority to the four-factor interpretation.

General Results: A Mini Meta-Analytic Summary

Given the heterogeneous nature of some of our findings, we conducted a mini meta-analysis of the three studies to synthesize our results and facilitate their interpretation (e.g., Goh, Hall, & Rosenthal, 2016; Lakens & Etz, 2018; but see Vosgerau et al., 2019). Effect sizes were transformed into Fisher's z to account for the slight negative bias in Pearson's r using standard procedures (Card, 2012) and weighted according to the inverse of their variance (i.e., sampling error), such that larger N s contributed more to the aggregate effect size estimate than smaller ones (Lipsey & Wilson, 2001). We employed the random effects model, which regards the pool of effect sizes as a sample of a larger universe of samples, with restricted maximum likelihood

estimation⁶. We used the *metafor* package (Viechtbauer, 2010) in *R* (version 3.6.1; R Core Team, 2019) to conduct all analyses.

Meta-analytic estimates can only be provided for constructs where $k > 1$, which included RWA, SDO, Need for Cognitive Closure, the HEXACO, and social and economic political ideology. Results for all overall effect size estimates are presented in Table 9. For the sake of brevity, we describe only the overall effect size estimates for Fatalistic Determinism, Genetic Determinism, and Free Will.

Determinism/Free Will and Authoritarianism/Political Ideology

Fatalistic Determinism manifested a large positive overall association with RWA ($r = .35$, 95% CI [.27, .43]) and social conservatism ($r = .27$, 95% CI [.25, .29]) and a moderate positive overall association with SDO Dominance ($r = .22$, 95% CI [.17, .27]). Fatalistic Determinism was not significantly related to economic conservatism. Genetic Determinism manifested a moderate positive relation with SDO Dominance ($r = .19$, 95% CI [.13, .24]); a small positive relation with RWA ($r = .12$, 95% CI [.04, .21]); and Genetic Determinism was not significantly related to economic conservatism or social conservatism. Lastly, Free Will demonstrated large positive correlations with RWA ($r = .29$, 95% CI [.21, .37]), economic conservatism ($r = .33$, 95% CI [.29, .37]), and social conservatism ($r = .29$, 95% CI [.23, .36]), and was not significantly related to SDO.

Determinism/Free Will and Need for Closure

Fatalistic Determinism manifested a moderate positive overall association with Need for Closure ($r = .19$, 95% CI [.08, .30]). In contrast, both Genetic Determinism and Free Will were not significantly related to Need for Closure.

⁶Given that our studies each employed multiple measures of RWA ($k = 9$), we adopted a three-level meta-analytic approach for RWA (see Van den Noortgate et al., 2015), modeling the sampling variance for each effect size (level one), variation across outcomes within each sample (level two), and variation across each sample (level three) so as to account for correlated sampling errors due to multiple effect sizes drawn from the same sample.

Determinism/Free Will and General Personality

Fatalistic Determinism manifested a small negative overall association with Honesty-Humility ($r = -.13$, 95% CI [-.19, -.06]) and Agreeableness ($r = -.10$, 95% CI [-.16, -.03]); and a large negative overall association with Conscientiousness ($r = -.28$, 95% CI [-.34, -.22]) and Openness ($r = -.26$, 95% CI [-.32, -.19]). Genetic Determinism manifested moderate to large negative relations with Honesty-Humility ($r = -.22$, 95% CI [-.29, -.15]), Agreeableness ($r = -.22$, 95% CI [-.30, -.14]), Conscientiousness ($r = -.25$, 95% CI [-.31, -.19]), and Openness ($r = -.18$, 95% CI [-.24, -.11]). Lastly, Free Will demonstrated a large positive correlation with Conscientiousness ($r = .25$, 95% CI [.19, .31]); a moderate positive correlation with Agreeableness ($r = .16$, 95% CI [.04, .28]); and a small positive correlation with Honesty-Humility ($r = .11$, 95% CI [.04, .17]). Free Will was not significantly related to Openness to Experience.

Discussion

Psychologists and philosophers have long speculated that the appeal of authoritarian ideologies lie in their ability to stave off existential uncertainties (e.g., Adorno et al., 1950; Fromm, 1941; Kay et al., 2009; Womick et al., 2019). Consistent with this tradition of research and theory, across three community samples, we found that deterministic beliefs predict (a) elevated RWA, SDO, dogmatism, need for certainty, valuation of power, and political intolerance and (b) lessened need for cognition, openness to experience, agreeableness, honesty-humility, and valuation of self-direction. These results generally remained intact after controlling for political ideology. Hence, belief in determinism may be an explanatorily and theoretically useful node in authoritarianism's well-established nomological network.

Given the cross-sectional nature of our approach, we could not ascertain the degree to which cognitive rigidity and/or epistemic motivations for certainty underlie these determinism-authoritarianism associations. Still, a wealth of literature highlights the relevance of cognitive rigidity and related psychological processes and motivations to authoritarianism and allied constructs (e.g., Rollwage, Dolan, & Fleming, 2018; Zmigrod et al., 2019), and our results are consistent with this possibility: several need for certainty variables manifested associations with fatalistic determinism beliefs and, to a lesser extent, genetic and environmental determinism beliefs. As these effect sizes were small to moderate, however, results should be interpreted cautiously.

As hypothesized, fatalistic determinism beliefs preferentially predicted the punitive social control elements of authoritarianism (i.e., RWA) relative to other varieties of determinism, whereas, in Study 1 but not Study 2, genetic determinism beliefs preferentially predicted the dominance-related elements of authoritarianism (i.e., SDO). This differential pattern may be attributable to the distinct psychological underpinnings of RWA and SDO. In the case of RWA, an uncertainty-driven desire for order and security, which is conceptually related to belief in fatalistic determinism, and in the case of SDO, a competition-driven desire for group dominance and inequality, which is conceptually related to belief in genetic determinism (Duckitt & Sibley, 2010). Extending this line of thought, believing that fate has pre-determined one's place in the universe may connote certainty and affirm current social hierarchies (i.e., by implicitly suggesting that "everything, and everyone, are in their right place"), whereas believing that events and actions are reducible to entropic, mechanistic physical causes may connote certainty only on a more limited basis, such as when accompanied by scientific racism and/or certain

cognitive biases (e.g., the naturalistic fallacy, which played a crucial role in social Darwinism; Moore, 1903/1962).

Further, our prediction that determinism beliefs would be associated with social conservatism but not economic conservatism was largely borne out. Social conservatism was positively related to fatalistic determinism beliefs and negatively related to belief in an unpredictable world, whereas economic conservatism was not significantly related to determinism beliefs⁷. These findings generally agree with the growing body of scholarship that suggests that the evidence for positive relations between need for certainty and economic conservatism is inconsistent and/or mixed (e.g., Federico & Malka, 2018; Costello et al., under review).

Results also raise the possibility that belief in environmental determinism accords with a different set of psychological motivations than other forms of determinism beliefs. Environmental determinism beliefs were not related to nearly all hypothesis-driven outcome variables, with the exception of need for certainty. Although these null results may merely speak to the potentially poor construct validity of the FAD+ Environmental Determinism factor, which comprises only three items, the differing epistemic implications of genetic vs. environmental determinism (i.e., “nature” vs. “nurture”) may be a fruitful area of future research. For instance, environmental determinants of behavior may seem within the realm of human control to a greater extent than either genetic factors or the machinations of fate.

The current investigation also provided what is, to our knowledge, the most comprehensive published examination of interrelations between free will and determinism

⁷ We also examined whether economic and social ideology manifest mutual suppressor effects in their relations with determinism beliefs in subsidiary analyses (see supplementary materials). In both studies, economic and social ideology acted as statistically significant suppressor variables for the other’s relation with fatalistic determinism beliefs, indicating that “purer” indicators of economic conservatism are negatively related to fatalistic determinism, whereas “purer” indicators of social conservatism are positively related to fatalistic determinism.

beliefs, on the one hand, and broadband personality traits, on the other, and is the first such study to have used the six-factor HEXACO model. As predicted, openness was negatively related to fatalistic determinism beliefs. Exploratory analyses indicated that these results are primarily attributable the inquisitiveness, unconventionality, and creativity facets of HEXACO Openness, rather than the aesthetic appreciation facet, which describes enjoyment of beauty in art and nature (see Table S6). Agreeableness and honesty-humility were negatively related to genetic determinism beliefs, highlighting the possibility that belief in genetic determinism tends to accompany insidious political attitudes and “dark” personality traits. Although effect sizes were only moderate in size, future longitudinal research should test mediational models involving such a coalition of genetic determinism beliefs, SDO, and putatively “dark” personality traits.

Conscientiousness also emerged as a large negative correlate of both fatalistic and genetic determinism in exploratory analyses. We were intrigued by this result, given the centrality of concern for order and structure to conscientiousness. Follow-up facet-level analyses (see Table S5), however, indicated that conscientiousness-determinism correlations were largely attributable to the HEXACO Prudence subscale, which assesses deliberativeness and self-control. Hence, the unexpected conscientiousness-determinism relations can perhaps be understood in the context of inverse relations between belief in determinism and feelings of agency, self-efficacy, and self-control (e.g., Clarkson et al., 2015).

Limitations and Future Directions

The current investigation possesses several significant strengths, including three large, culturally heterogeneous samples that employ differing measures of our constructs of interest. Still, a few notable limitations warrant consideration in independent replication and extension efforts. Foremost among these is the ideological makeup of our samples. As is typical of online

community samples (Levay, Freese, & Druckman, 2016), the majority of our participants were politically liberal, and it accordingly remains plausible that our results were influenced by the political skew of our sample. Cognitive rigidity, authoritarianism, and related phenomena are traditionally thought to be associated with right-wing and conservative politics (cf., Costello et al., under review), and as such our findings could differ somewhat in a right-skewed sample. Hence, conceptual replication of our results in such a sample is an important future direction.

Moreover, differences across the FAD-4 and the FAD+ may have introduced excessive error variance to our comparisons across Study 1, on the one hand, and Studies 2 and 3, on the other. Parsing the degree to which cross-study variability is attributable to (a) differences across the FAD-4 and FAD+, (b) ambient error variance, or (c) population differences (i.e., Yourmorals.org vs. MTurk) may be beyond the scope of the current research. Although a mini meta-analytic review allowed us draw preliminary conclusions concerning these mixed results, cross-study differences challenge the generalizability of our findings. Most notably, RWA was positively related to genetic determinism in Studies 2 and 3 yet negatively related to genetic determinism in Study 1. Future research will be needed to clarify the boundary conditions of RWA-genetic determinism relations. By the same token, however, most of our hypotheses were supported across all three samples. These findings, which include positive relations between fatalistic determinism and RWA, negative relations between fatalistic determinism and openness, and negative relations between genetic determinism and agreeableness, can be seen to have survived a “risky test” (Meehl, 1978). As such, they may be especially likely to reflect genuine phenomena.

Additionally, the current studies employed cross-sectional methodology, precluding our ability to assess temporal precedence, let alone causality. Future experimental and/or

longitudinal research should test the causal direction of the authoritarianism-determinism relationship. Our overreliance on self-report data also raises the specter of mono-method bias. Although there is reason to doubt that method variance across self-report measures invariably leads to inflated correlations (Spector, 2006), the issue of acquiescence response bias has long been highlighted as a potential source of systematic error variance in measures pertaining to both authoritarianism and free will/determinism beliefs (Adorno et al., 1950; Paulhus, 2011; Peabody, 1961; Rokeach, 1967; cf. Rorer, 1965). Observer-reports, behavioral measures, and meta-cognitive tasks would provide more robust corroboration of our findings and conclusions. Even still, it is not clear how constructs such as belief in determinism and authoritarianism, which largely reflect personal beliefs and attitudes, can be assessed with good validity with non-self-reports.

Conclusion

The objectivist political philosopher Ayn Rand (1972) observed that “Dictatorship and determinism are reciprocally reinforcing corollaries [...] if one believes that reason and volition are impotent, one has to accept the rule of force” (p. 21). We caution against what is, perhaps ironically, Rand’s absolute language, but the presented research suggests that her observation conveys a kernel of truth. Given the expansion of authoritarian leaders’ popularity in recent years (e.g., Harms, Wood, Landay, Lester, & Lester, 2018), the attitudinal hallmarks of authoritarianism merit close attention from psychological science. Belief in determinism was once considered a key component of the authoritarian personality (Adorno et al., 1950). At a distance of seventy years, perhaps the time has come to consider this possibility once again.

References

- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., and Sanford, R. N. (1950). *The Authoritarian Personality*. New York, NY: Harper.
- Altemeyer, B. (1981). *Right-wing authoritarianism*. University of Manitoba Press: Winnipeg.
- Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*: Jossey-Bass: San Francisco.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

- Altemeyer, B. (1996). *The authoritarian specter*. Harvard University Press: Cambridge.
- Bandalos, D. L., & Finney, S. J. (2018). Exploratory and confirmatory. In *The Reviewer's Guide to Quantitative Methods in the Social Sciences*. (pp. 93-114). New York.
- Baumeister, R. F., Masicampo, E. J., & DeWall, C. N. (2009). Prosocial benefits of feeling free: Disbelief in free will increases aggression and reduces helpfulness. *Personality and Social Psychology Bulletin*, *35*, 260-268.
- Bergner, R. M., & Ramon, A. (2013). Some implications of beliefs in altruism, free will, and nonreductionism. *The Journal of Social Psychology*, *153*, 598-618.
- Budner, S. 1962. Intolerance of ambiguity as a personality variable. *Journal of Personality*, *30*, 29-50.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk. *Perspectives on Psychological Science*, *6*, 3-5.
- Card, N. A. (2012). *Methodology in the social sciences. Applied meta-analysis for social science research*. New York, NY, US: Guilford Press.
- Carey, J. M., & Paulhus, D. L. (2013). Worldview implications of believing in free will and/or determinism: Politics, morality, and punitiveness. *Journal of Personality*, *81*, 130-141.
- Caspar, E. A., Verdin, O., Rigoni, D., Cleeremans, A., & Klein, O. (2017). What do you believe in? French translation of the FAD-plus to assess beliefs in free will and determinism and their relationship with religious practices and personality traits. *Psychologica Belgica*, *57*, 1-16.
- Chirumbolo, A. (2002). The relationship between need for cognitive closure and political orientation: The mediating role of authoritarianism. *Personality and Individual Differences*, *32*, 603-610.
- Clarkson, J. J., Chambers, J. R., Hirt, E. R., Otto, A. S., Kardes, F. R., & Leone, C. (2015). The self-control consequences of political ideology. *Proceedings of the National Academy of Sciences*, *112*, 8250-8253.

- Coppock, A. (2018). Generalizing from survey experiments conducted on Mechanical Turk: A replication approach. *Political Science Research and Methods*, 1-16.
- Costello, T.H., Bowes, S.M., Malka, A., Baldwin, M., Lilienfeld, S.O (2020). Thinking, left and right: The rigidity of the right revisited. Manuscript submitted for publication.
- Costello, T. H., Smith, S. F., Bowes, S. M., Riley, S., Berns, G. S., & Lilienfeld, S. O. (2019). Risky business: Psychopathy, framing effects, and financial outcomes. *Journal of Research in Personality*, 78, 125-132.
- Crawford, J. T., & Pilanski, J. M. (2014). The Differential Effects of Right-Wing Authoritarianism and Social Dominance Orientation on Political Intolerance. *Political Psychology*, 35, 557-576.
- Crescioni, A. W., Baumeister, R. F., Ainsworth, S. E., Ent, M., & Lambert, N. M. (2016). Subjective correlates and consequences of belief in free will. *Philosophical Psychology*, 29, 41-63.
- Crowson, H. M., Thoma, S. J., & Hestevold, N. (2005). Is political conservatism synonymous with authoritarianism?. *The Journal of Social Psychology*, 145, 571-592.
- Duckitt, J. (2009). Authoritarianism and dogmatism. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 298-317). New York, NY, US: The Guilford Press.
- Duckitt, J., & Bizumic, B. (2013). Multidimensionality of right-wing authoritarian attitudes: Authoritarianism-conservatism-traditionalism. *Political Psychology*, 34, 841-862.
- Duckitt, J., Bizumic, B., Krauss, S. W., & Heled, E. (2010). A tripartite approach to right-wing authoritarianism: The authoritarianism-conservatism-traditionalism model. *Political Psychology*, 31, 685-715.
- Duckitt, J., & Sibley, C. G. (2010). Personality, ideology, prejudice, and politics: A dual-process motivational model. *Journal of Personality*, 78, 1861-1894.

- Ekehammar, B., Akrami, N., Gylje, M., & Zakrisson, I. (2004). What matters most to prejudice: Big five personality, social dominance orientation, or right-wing authoritarianism? *European Journal of Personality, 18*, 463-482.
- Enders, C. K. (2001). The impact of nonnormality on full information maximum-likelihood estimation for structural equation models with missing data. *Psychological Methods, 6*, 352-370.
- Everett, J. A. (2013). The 12 item social and economic conservatism scale (SECS). *PloS One, 8*(12), e82131.
- Ewusi-Boisvert, E., & Racine, E. (2018). A critical review of methodologies and results in recent research on belief in free will. *Neuroethics, 11*, 97-110.
- Federico, C. M., & Malka, A. (2018). The contingent, contextual nature of the relationship between needs for security and certainty and political preferences: Evidence and implications. *Political Psychology, 39*, 3-48.
- Feldman, G., & Chandrashekar, S. P. (2018). Laypersons' beliefs and intuitions about free will and determinism: New insights linking the social psychology and experimental philosophy paradigms. *Social Psychological and Personality Science, 9*, 539-549.
- Feldman, S., & Johnston, C. (2014). Understanding the determinants of political ideology: Implications of structural complexity. *Political Psychology, 35*, 337-358.
- Feldman, S., & Stenner, K. (1997). Perceived threat and authoritarianism. *Political Psychology, 18*, 741-770.
- Finney, S. J., & DiStefano, C. (2013). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (pp. 269-314). Greenwich, CT: Information Age.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

- Friesen, J. P., Kay, A. C., Eibach, R. P., & Galinsky, A. D. (2014). Seeking structure in social organization: Compensatory control and the psychological advantages of hierarchy. *Journal of Personality and Social Psychology, 106*, 590-609.
- Fromm, E. (1941). *Escape from Freedom* New York. NY: Holt, Rinehart & Winston.
- Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences, 102*, 74-78.
- Goh, J. X., Hall, J. A., & Rosenthal, R. (2016). Mini meta-analysis of your own studies: Some arguments on why and a primer on how. *Social and Personality Psychology Compass, 10*, 535-549.
- Hannikainen, I., Cabral, G., Machery, E., & Struchiner, N. (2017). A deterministic worldview promotes approval of state paternalism. *Journal of Experimental Social Psychology, 70*, 251-259.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.
- Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E. . . . Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO₇ scale. *Journal of Personality and Social Psychology, 109*, 1003-1028.
- Jost, J. T. (2017). Ideological asymmetries and the essence of political psychology. *Political Psychology, 38*, 167-208.
- Katz, D. (1960). The functional approach to the study of attitudes. *Public Opinion Quarterly, 24*, 163-204.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

- Kay, A. C., Whitson, J. A., Gaucher, D., & Galinsky, A. D. (2009). Compensatory control: Achieving order through the mind, our institutions, and the heavens. *Current Directions in Psychological Science, 18*, 264-268.
- Keller, J. (2005). In genes we trust: the biological component of psychological essentialism and its relationship to mechanisms of motivated social cognition. *Journal of Personality and Social Psychology, 88*, 686-702.
- Kondratowicz-Nowak, B., & Zawadzka, A. M. (2018). Does belief in free will make us feel good and satisfied? *Health Psychology Report, 2*, 1-9.
- Kossowska, M., & Hiel, A. V. (2003). The relationship between need for closure and conservative beliefs in Western and Eastern Europe. *Political Psychology, 24*, 501-518.
- Lakens, D., & Etz, A. J. (2017). Too true to be bad: When sets of studies with significant and nonsignificant findings are probably true. *Social Psychological and Personality Science, 8*, 875-881.
- Levay, K. E., Freese, J., & Druckman, J. N. (2016). The demographic and political composition of Mechanical Turk samples. *Sage Open, 6*, 2158244016636433.
- Lindeman, M., & Verkasalo, M. (2005). Measuring values with the short Schwartz's value survey. *Journal of Personality Assessment, 85*, 170-178.
- Liu, J., Ludeke, S. G., & Zettler, I. (2017). The HEXACO correlates of authoritarianism's facets in the US and Denmark. *Personality and Individual Differences, 116*, 348-352.
- Ludeke, S. G., Klitgaard, C. N., & Vitriol, J. (2018). Comprehensively-measured authoritarianism does predict vote choice: The importance of authoritarianism's facets, ideological sorting, and the particular candidate. *Personality and Individual Differences, 123*, 209-216.

- Malka, A., Lelkes, Y., & Holzer, N. (2017). Rethinking the Rigidity of the Right Model: Three Suboptimal Methodological Practices and Their Implications. In *Politics of Social Psychology* (pp. 126-146): Psychology Press.
- Martin, N. D., Rigoni, D., & Vohs, K. D. (2017). Free will beliefs predict attitudes toward unethical behavior and criminal punishment. *Proceedings of the National Academy of Sciences, 114*, 7325-7330.
- Martin, J. L. (2001). The authoritarian personality, 50 years later: What questions are there for political psychology? *Political Psychology, 22*, 1-26.
- Meeusen, C., & Dhont, K. (2015). Parent–child similarity in common and specific components of prejudice: The role of ideological attitudes and political discussion. *European Journal of Personality, 29*, 585-598.
- Miller, J. D., Crowe, M., Weiss, B., Maples-Keller, J. L., & Lynam, D. R. (2017). Using online, crowdsourcing platforms for data collection in personality disorder research: The example of Amazon’s Mechanical Turk. *Personality Disorders: Theory, Research, and Treatment, 8*, 26.
- Mirisola, A., Roccato, M., Russo, S., Spagna, G., & Vieno, A. (2014). Societal threat to safety, compensatory control, and right-wing authoritarianism. *Political Psychology, 35*, 795-812.
- Moynihan, A. B., Igou, E. R., & van Tilburg, W. A. (2017). Free, connected, and meaningful: Free will beliefs promote meaningfulness through belongingness. *Personality and Individual Differences, 107*, 54-65.
- Nadelhoffer, T., Shepard, J., Nahmias, E., Sripada, C., & Ross, L. T. (2014). The free will inventory: Measuring beliefs about agency and responsibility. *Consciousness and Cognition, 25*, 27-41.
- Paulhus, D. L., & Margesson, A. (1994). Free will and determinism (FAD) scale. *Unpublished manuscript, University of British Columbia, Vancouver, British Columbia, Canada.*

AUTHORITARIANISM AND BELIEF IN DETERMINISM

- Paulhus, D. L., & Carey, J. M. (2011). The FAD-Plus: Measuring lay beliefs regarding free will and related constructs. *Journal of Personality Assessment, 93*, 96-104.
- Peabody, D. (1966). Authoritarianism scales and response bias. *Psychological Bulletin, 65*, 11-23.
- Popper, K. (1957/2013). *The poverty of historicism*: Routledge.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717-731.
- Protzko, J., Ouimette, B., & Schooler, J. (2016). Believing there is no free will corrupts intuitive cooperation. *Cognition, 151*, 6-9.
- R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>.
- Rand, A. (1976). *The Ayn Rand Letter: Volumes 1-4, 1971-1976*. Second Renaissance Books
- Rangel, U., & Keller, J. (2011). Essentialism goes social: Belief in social determinism as a component of psychological essentialism. *Journal of Personality and Social Psychology, 100*, 1056-1078.
- Revelle, W. (2018). Procedures for psychological, psychometric, and personality research: R package version 1.8. 4. In: Evanston: Northwestern University.
- Reyna, C. (2017). Scale creation, use, and misuse: How politics undermines measurement. In *Politics of Social Psychology* (pp. 91-108): Psychology Press.
- Roets, A., & Van Hiel, A. (2011). Item selection and validation of a brief, 15-item version of the Need for Closure Scale. *Personality and Individual Differences, 50*, 90-94.
- Rollwage, M., Dolan, R. J., & Fleming, S. M. (2018). Metacognitive failure as a feature of those holding radical beliefs. *Current Biology, 28*, 4014-4021.
- Rorer, L. G. (1965). The great response-style myth. *Psychological Bulletin, 63*, 129-156.

- Rokeach, M. (1967). Authoritarianism scales and response bias: Comment on Peabody's paper. *Psychological Bulletin*, *67*, 349-355.
- Rollwage, M., Dolan, R. J., & Fleming, S. M. (2018). Metacognitive Failure as a Feature of Those Holding Radical Beliefs. *Current Biology*, *28*, 4014-4021.
- Rutjens, B. T., van Harreveld, F., van der Pligt, J., Kreemers, L. M., & Noordewier, M. K. (2013). Steps, stages, and structure: Finding compensatory order in scientific theories. *Journal of Experimental Psychology: General*, *142*, 313-318.
- Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review*, *12*, 248-279.
- Sidanius, J., Cotterill, S., Sheehy-Skeffington, J., Kteily, N., & Carvacho, H. (2017). Social dominance theory: Explorations in the psychology of oppression. In C. G. Sibley & F. K. Barlow (Eds.), *The Cambridge handbook of the psychology of prejudice* (pp. 149-187). New York, NY, US: Cambridge University Press.
- Shariff, A. F., Greene, J. D., Karremans, J. C., Luguri, J. B., Clark, C. J., Schooler, J. W., ... & Vohs, K. D. (2014). Free will and punishment: A mechanistic view of human nature reduces retribution. *Psychological Science*, *25*, 1563-1570.
- Spector, P. E. (2006). Method variance in organizational research: truth or urban legend? *Organizational Research Methods*, *9*, 221-232.
- Stenner, K. (2005). *The authoritarian dynamic*: Cambridge University Press. Cambridge.
- Stenner, K. (2009). Three kinds of "conservatism". *Psychological Inquiry*, *20*, 142-159.
- Van den Noortgate, W., López-López, J. A., Marín-Martínez, F., & Sánchez-Meca, J. (2015). Meta-analysis of multiple outcomes: a multilevel approach. *Behavior Research Methods*, *47*, 1274-1294.

- Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, 36, 1-48.
- Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, 41, 321-327.
- Vohs, K. D., & Schooler, J. W. (2008). The value of believing in free will: Encouraging a belief in determinism increases cheating. *Psychological Science*, 19, 49-54.
- Vosgerau, J., Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2019). 99% impossible: A valid, or falsifiable, internal meta-analysis. *Journal of Experimental Psychology: General*, 148, 1628-1639.
- Willoughby, E. A., Love, A. C., McGue, M., Iacono, W. G., Quigley, J., & Lee, J. J. (2019). Free will, determinism, and intuitive judgments about the heritability of behavior. *Behavior Genetics*, 49, 136-153.
- Womick, J., Ward, S. J., Heintzelman, S. J., Woody, B., & King, L. A. (2019). The existential function of right-wing authoritarianism. *Journal of Personality*. Pagination forthcoming.
- Zakrisson, I. (2005). Construction of a short version of the Right-Wing Authoritarianism (RWA) scale. *Personality and Individual Differences*, 39, 863-872.
- Zettler, I., Hilbig, B. E., & Haubrich, J. (2011). Altruism at the ballots: Predicting political attitudes and behavior. *Journal of Research in Personality*, 45, 130-133.
- Zhao, X., Liu, L., Zhang, X. X., Shi, J. X., & Huang, Z. W. (2014). The effect of belief in free will on prejudice. *PloS one*, 9, e91572.
- Zmigrod, L., Rentfrow, P. J., & Robbins, T. W. (2019). The partisan mind: Is extreme political partisanship related to cognitive inflexibility? *Journal of Experimental Psychology: General*. Advance online publication.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 1. *Factor pattern coefficients and factor intercorrelations of the FAD-4.*

Variable	FD	R/UW	HBP	MR	FW	GD	C/U	h ²
Fate already has a plan for each of us	.94	-.04	.05	.00	.16	.00	.04	.85
I don't believe in destiny.	-.86	-.09	.10	.04	.08	-.09	.14	.64
I believe that my future has already been pre-determined by fate.	.83	.00	.10	.02	.02	.10	-.09	.78
Whether we like it or not, mysterious forces seem to move our lives.	.71	-.08	-.22	-.09	.14	.06	.16	.50
No matter how hard you try, you can't change your destiny.	.57	.16	.04	.09	-.25	.15	-.20	.65
I hate it when scientists try to take the mystery out of life.	.44	.03	-.31	-.05	.14	-.18	-.08	.44
What will be, will be-there's not much you can do about it.	.37	.32	.03	.04	-.16	.09	-.17	.45
Life is hard to predict because it is almost totally random	-.07	.88	.05	.04	.06	-.26	.14	.62
Life seems unpredictable - just like throwing dice or flipping a coin.	.04	.77	.02	.03	-.01	-.14	.15	.51
Chance events seem to be the major cause of human history.	.06	.55	.09	-.02	-.01	.06	-.31	.39
No one can predict what will happen in this world.	-.09	.43	-.42	.06	.02	.00	-.08	.33
Scientists will never be able to predict human behavior precisely.	.00	.05	-.93	.02	.05	-.20	.05	.65
Psychologists will eventually figure out all human behaviors.†	-.07	.10	.75	-.01	.13	.02	-.01	.59
I like the idea that people can't be predicted.	-.09	.16	-.45	-.10	.11	-.02	.02	.24
Your environment created your current intelligence and personality. †	-.03	.08	.24	-.24	.22	.19	-.04	.28
Criminals are totally responsible for the bad things they do.	-.03	.13	.03	.78	.20	.13	-.13	.64
We should avoid punishing people because many can't help it.†	.03	.01	.05	-.73	.01	.02	.08	.50
People must take full responsibility for any bad choices they make.	.00	.02	-.08	.58	.33	.22	-.03	.55
Bad behavior is caused by bad life circumstances.	-.04	-.04	-.02	-.55	.12	.18	-.06	.34
People don't choose to be in the situations they end up in.†	-.08	-.28	.00	-.31	.16	-.03	.08	.37
People can overcome any obstacles if they truly want to.	.12	.00	.05	-.01	.77	-.08	.01	.61
Strength of mind can always overcome the bodies desires.	.10	.01	.07	.06	.64	-.05	.00	.45
People have complete control over the decisions they make.	-.06	.04	.00	.31	.52	-.06	-.10	.55
People's biological makeup influences their talents and personality	.01	-.27	-.17	.07	-.12	.77	.19	.44
Your genes determine your future.	.06	-.10	.03	.00	-.02	.61	.02	.35
Human behavior always follows the laws of nature.†	-.04	.08	.23	-.01	.00	.36	-.04	.32
I don't believe in chance.	.07	.21	.07	.01	-.03	.07	-.60	.35
There are random events going on-even at the level of atoms.†	-.08	.29	-.09	.03	-.02	.15	.50	.38
Fatalistic Determinism	—							
Random/Unpredictable World	.19*	—						
Human Behavior Predictability	-.07*	.03*	—					
Moral Responsibility	-.07*	-.37*	-.42*	—				
Free Will	-.05*	-.06*	-.24*	.46*	—			
Genetic Determinism	.02	.42*	.53*	-.44*	-.34*	—		
Chance/Entropy	-.42*	-.12*	-.28*	.15*	-.03*	-.16*	—	

Note. **Bolded** denotes loadings >.30; *denotes $p < .01$. † denotes items abridged due to lack of space. FD=Fatalistic Determinism; R/UW=Random and Unpredictable World; HBP=Human Behavior Predictability; MR=Moral Responsibility; FW=Free Will, GD=Genetic Determinism; C/U=Chance/Uncertainty.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 2. *Correlations among outcomes in Study 1, with 95% confidence intervals.*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. RWA	—										
2. SDO D	.50**	—									
	[.44, .56]										
3. IOA	.43**	.23**	—								
	[.33, .52]	[.11, .35]									
4. Need for Closure	.40**	.31**	.55**	—							
	[.30, .48]	[.19, .42]	[.44, .65]								
5. Need for Cog. (R)	.21**	.11*	.20**	.43**	—						
	[.13, .28]	[.02, .21]	[.07, .32]	[.34, .51]							
6. Economic	.50**	.43**	.27**	.16**	.01	—					
	[.45, .54]	[.36, .49]	[.17, .36]	[.08, .24]	[-.04, .07]						
7. Social	.76**	.46**	.28**	.25**	.09**	.50**	—				
	[.73, .78]	[.39, .52]	[.18, .37]	[.17, .33]	[.04, .15]	[.48, .52]					
8. BFI O	-.29**	-.16**	-.28**	-.45**	-.48**	-.13**	-.20**	—			
	[-.34, -.24]	[-.23, -.09]	[-.37, -.19]	[-.51, -.39]	[-.52, -.44]	[-.16, -.11]	[-.23, -.18]				
9. BFI C	.12**	-.01	.14**	.14**	-.09**	.13**	.13**	-.03*	—		
	[.06, .17]	[-.08, .06]	[.05, .23]	[.06, .22]	[-.15, -.04]	[.10, .15]	[.10, .15]	[-.06, -.01]			
10. BFI E	-.02	-.07*	-.10*	-.14**	-.11**	.02	-.00	.20**	.14**	—	
	[-.07, .04]	[-.15, -.00]	[-.19, -.00]	[-.21, -.06]	[-.16, -.06]	[-.00, .05]	[-.03, .02]	[.18, .22]	[.11, .16]		
11. BFI A	-.08**	-.32**	-.15**	-.17**	-.01	-.11**	-.06**	.09**	.17**	.17**	—
	[-.13, -.02]	[-.39, -.25]	[-.25, -.06]	[-.25, -.09]	[-.06, .04]	[-.13, -.08]	[-.08, -.03]	[.07, .12]	[.14, .19]	[.15, .20]	
12. BFI N	-.04	-.02	.04	.03	.15**	-.15**	-.07**	-.05**	-.27**	-.26**	-.27**
	[-.10, .01]	[-.09, .05]	[-.05, .14]	[-.05, .11]	[.09, .20]	[-.18, -.12]	[-.09, -.04]	[-.08, -.03]	[-.29, -.24]	[-.28, -.24]	[-.29, -.24]

Note. * indicates $p < .05$. ** indicates $p < .01$. RWA = Right-wing Authoritarianism; SDO D = SDO₇ Dominance; Need for Cog = Need for Cognition; BFI O = Openness, BFI C = Conscientiousness, BFI E = Extraversion, BFI A = Agreeableness, BFI N = Neuroticism.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 3. Zero-order correlations and partial correlations of the FAD-4 factors with outcome variables (with descriptives).

Variables	N	M (SD)	FD		GD		HBP		R/U		C/U		MR		FW	
			<i>r</i>	<i>r</i> _{12,PC}												
RWA	1,083	34.19 (13.78)	.34	.30*	-.18	-.02*	-.21	-.03*	-.15	-.02*	-.15	-.18*	.40	.06*	.27	.05*
SDO Dominance	662	20.15 (10.46)	.21	.14	.19	.37*	<i>.08</i>	.27*	<i>.02</i>	.14*	-.19	-.20	.19	-.11*	<i>.01</i>	-.21*
IoA	591	33.39 (8.22)	<i>.08</i>	<i>.02*</i>	<i>-.04</i>	<i>.04*</i>	<i>.02</i>	<i>.12*</i>	<i>-.07</i>	<i>-.01*</i>	-.13	<i>-.12</i>	.32	.18*	.34	.24*
Need for Closure	566	42.84 (11.02)	.14	.11*	<i>-.06</i>	<i>-.01*</i>	<i>-.02</i>	<i>.05*</i>	<i>-.00</i>	<i>.05*</i>	-.21	-.21	.22	.12*	.20	.14*
Need for Cognition	1,358	34.47 (10.85)	-.20	-.19*	<i>.08</i>	<i>.06*</i>	<i>.04</i>	<i>.03*</i>	-.11	-.13*	.17	.17	<i>-.03</i>	<i>-.00*</i>	<i>-.04</i>	<i>.02*</i>
Economic Ideology	4,999	3.86 (1.96)	.07	–	-.19	–	-.23	–	-.18	–	<i>.04</i>	–	.48	–	.32	–
Social Ideology	4,886	2.44 (1.70)	.27	–	-.23	–	-.26	–	-.15	–	-.09	–	.42	–	.27	–
BFI Openness	5,493	3.98 (.61)	-.08	–	.06	–	<i>.03</i>	–	<i>-.03</i>	–	.11	–	-.12	–	-.09	–
BFI Conscientiousness	5,493	3.35 (.76)	<i>-.02</i>	–	-.14	–	-.13	–	-.19	–	.08	–	.24	–	.18	–
BFI Extraversion	5,493	2.88 (.89)	.04	–	-.11	–	-.07	–	-.08	–	.05	–	.05	–	.13	–
BFI Agreeableness	5,493	3.46 (.67)	<i>.02</i>	–	-.12	–	-.13	–	-.06	–	.09	–	<i>-.02</i>	–	.05	–
BFI Neuroticism	5,493	2.88 (.88)	.11	–	.09	–	.04	–	.15	–	-.08	–	-.17	–	-.16	–

Note. **Bolded** denotes $p < .01$. *Italicized* denotes $p < .05$. FAD-4 subscales N=18,178. $r_{12,PC}$ denotes partial correlations controlling for political conservatism. *denotes a significant change from the zero-order correlation (per bootstrapping analyses reported in online supplementary materials). IoA=Intolerance of Ambiguity; FD=Fatalistic Determinism; R/UW=Random and Unpredictable World; HBP=Human Behavior Predictability; MR=Moral Responsibility; FW=Free Will, GD=Genetic Determinism; C/U=Chance/Uncertainty.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 4. *Loadings, SEs, factor correlations, and construct reliabilities for the FAD+.*

	FD		GD		FW		C & UP		ED		MR	
	λ	SE	λ	SE	λ	SE	λ	SE	λ	SE	λ	SE
01. I believe that the future has already been determined by fate.	.76	.06	—	—	—	—	—	—	—	—	—	—
13. Whether people like it or not, mysterious forces move their lives.	.64	.06	—	—	—	—	—	—	—	—	—	—
17. Whatever will be, will be – there's not much you can do about it.	.69	.05	—	—	—	—	—	—	—	—	—	—
05. No matter how hard you try, you can't change your destiny.	.71	.06	—	—	—	—	—	—	—	—	—	—
09. Fate already has a plan for everyone.	.84	.04	—	—	—	—	—	—	—	—	—	—
10. Your genes determine your future.	—	—	.69	.08	—	—	—	—	—	—	—	—
18. Like other animals, human behavior follows the laws of nature.	—	—	.45	.06	—	—	—	—	—	—	—	—
02. People's biological makeup determines their talents and personality.	—	—	.66	.09	—	—	—	—	—	—	—	—
12. People can overcome any obstacles if they truly want to.	—	—	—	—	.70	.05	—	—	—	—	—	—
20. People have complete free will.	—	—	—	—	.70	.05	—	—	—	—	—	—
26. Strength of mind can overcome the body's desires.	—	—	—	—	.56	.05	—	—	—	—	—	—
04. People have complete control over the decisions they make.	—	—	—	—	.78	.04	—	—	—	—	—	—
11. Life seems unpredictable – just like throwing dice or flipping a coin.	—	—	—	—	—	—	.62	.06	—	—	—	—
15. People are unpredictable.	—	—	—	—	—	—	.36	.06	—	—	—	—
19. Luck plays a big role in people's lives.	—	—	—	—	—	—	.67	.05	—	—	—	—
22. What happens to people is a matter of chance.	—	—	—	—	—	—	.76	.05	—	—	—	—
25. Life is hard to predict because it is almost totally random.	—	—	—	—	—	—	.64	.05	—	—	—	—
03. Chance events seem to be the major cause of human history.	—	—	—	—	—	—	.72	.05	—	—	—	—
14. Your past environment created your current intelligence/personality.	—	—	—	—	—	—	—	—	.60	.08	—	—
21. Parents' character will determine the character of their children.	—	—	—	—	—	—	—	—	.65	.07	—	—
24. Childhood environment will determine your success as an adult.	—	—	—	—	—	—	—	—	.57	.07	—	—
16. Criminals are totally responsible for the bad things they do.	—	—	—	—	—	—	—	—	—	—	.76	.04
23. People are always at fault for their bad behavior.	—	—	—	—	—	—	—	—	—	—	.72	.05
08. People must take full responsibility for any bad choices they make.	—	—	—	—	—	—	—	—	—	—	.64	.00
Construct Replicability (H)		.87		.69		.79		.71		.64		.75
	Factor Correlations											
Fatalistic Determinism	—											
Genetic Determinism	.61		—									
Free Will	-.11		-.13		—							
Chance and Unpredictability	.47		.40		-.25		—					
Environmental Determinism	.22		.66		.00		.24		—			
Moral Responsibility	-.10		-.04		.77		-.16		-.03			

Note. **Bolded** if $p < .01$. The wording of items 2, 13, 14, and 18 is abridged due to lack of space.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 5. *Correlations among Sample 2 outcomes.*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. AP	—															
2. RWA	.45**	—														
3. ACT A	.37**	.45**	—													
4. ACT C	.48**	.45**	.56**	—												
5. ACT T	.37**	.55**	.51**	.53**	—											
6. SDO D	.23**	.59**	.21**	.12	.15*	—										
7. DOG	.12	.30**	.07	.04	.18**	.20**	—									
8. NFC	.26**	.14*	.14*	.13	.18**	.00	.20**	—								
9. Pol. Intol.	.15*	.21**	.11	.04	.07	.11	.32**	.20**	—							
10. SECS S	.37**	.56**	.32**	.38**	.55**	.21**	.05	.17**	-.06	—						
11. SECS E	.18**	.25**	.26**	.12	.16*	.25**	-.04	.09	-.14*	.39**	—					
12. HEXACO H	-.04	-.19**	-.04	.01	-.02	-.31**	-.11	-.10	-.05	-.03	-.25**	—				
13. HEXACO E	.09	.05	.10	.13*	.14*	-.04	.15*	.47**	.11	.15*	-.01	.14*	—			
14. HEXACO X	.02	.10	.10	.13*	.11	-.01	.05	-.37**	-.07	.15*	.11	.03	-.30**	—		
15. HEXACO A	.02	-.02	-.01	.12	.03	-.16*	-.12	-.28**	-.05	.08	-.08	.36**	-.18**	.41**	—	
16. HEXACO C	.03	-.23**	.12	.15*	.11	-.39**	-.09	.09	-.07	.04	.08	.17*	.03	.21**	.21**	—
17. HEXACO O	-.46**	-.44**	-.18**	-.17*	-.15*	-.37**	-.25**	-.32**	-.17**	-.21**	-.20**	.17*	-.04	.22**	.19**	.19**

Note. * indicates $p < .05$. ** indicates $p < .01$. AP = Authoritarian Parenting; RWA = Right-wing Authoritarianism; ACT = Authoritarianism, Conventionalism, Traditionalism scales; SDO D = SDO₇ Dominance; DOG = the DOG Scale; NFC = Need for Closure; Intol. = Political Intolerance; SECS E = Economic Conservatism; SECS S = Social Conservatism; H = Honesty-humility; E = Emotionality; X = Extraversion; A = Agreeableness; C = Conscientiousness; O = Openness.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 6. Zero-order correlations and partial correlations of the FAD+ factors with outcome variables for Study 2.

Variables	M (SD)	FD		GD		ED		C & UP		MR		FW	
		<i>r</i>	<i>r</i> _{12.PC}	<i>r</i>	<i>r</i> _{12.PC}	<i>r</i>	<i>r</i> _{12.PC}						
Auth. Parenting	1.33 (.35)	.29	.28	.22	.22	<i>.11</i>	.12	.09	.15*	.21	.12*	.22	.12*
RWA	83.07 (46.83)	.39	.42*	.20	.23*	.05	<i>.09</i>	-0.00	.13*	.21	<i>.01*</i>	.24	<i>.03*</i>
ACT Aggression	29.15 (8.61)	.35	.36	.24	.25	.06	<i>.09</i>	.08	.20*	.38	.26*	.36	.23*
ACT Conventionalism	28.28 (8.18)	.35	.36	.21	.21	.08	<i>.11</i>	.08	.19*	.35	.23*	.36	.14*
ACT Traditionalism	29.11 (7.71)	.31	.31	.15	.14	.03	<i>.07</i>	-.03	<i>.08*</i>	.30	.15*	.31	.23*
SDO Dominance	12.73 (10.74)	.24	.21	.18	.17	.05	<i>.07</i>	-.04	<i>.03*</i>	-.01	-.18*	.04	-.14*
Dogmatism	93.82 (27.27)	.16	.14	<i>.10</i>	<i>.09</i>	.04	<i>.05</i>	-.07	-.04*	.07	-.00*	.06	-.02*
Need for Closure	60.50 (13.64)	.26	.25	.25	.24	.19	.20	.18	.21*	.15	<i>.10*</i>	.07	<i>.02*</i>
Political Intolerance	12.11 (4.37)	.33	.32	.14	.14	.06	<i>.06</i>	.18	.20	-.02	-.04	-.05	-.08
SECS Social	20.89 (5.20)	.25	–	.15	–	-.01	–	-.07	–	.32	–	.34	–
SECS Economic	14.11 (3.00)	-.03	–	.01	–	-.01	–	-.21	–	.34	–	.37	–
HEXACO H	57.10 (12.21)	-.12	–	-.19	–	-.14	–	-.13	–	.14	–	<i>.10</i>	–
HEXACO E	51.42 (11.04)	.20	–	.12	–	.05	–	.14	–	-.00	–	-.05	–
HEXACO X	52.04 (12.37)	-.23	–	-.18	–	<i>-.09</i>	–	-.22	–	.27	–	.32	–
HEXACO A	50.86 (10.50)	<i>-.10</i>	–	-.18	–	-.13	–	-.17	–	.18	–	.22	–
HEXACO C	61.68 (9.98)	-.27	–	-.24	–	-.13	–	-.13	–	.28	–	.24	–
HEXACO O	56.89 (11.65)	-.27	–	-.19	–	-.08	–	-.05	–	-.02	–	-.04	–

Note. N=479. **Bolded** denotes $p < .01$. *Italicized* denotes $p < .05$. $r_{12.PC}$ denotes partial correlations controlling for global political ideology. *denotes a significant change from the zero-order correlation (per bootstrapping analyses reported in online supplementary materials). FD=Fatalistic Determinism; GD=Genetic Determinism; FW=Free Will; E & UP=Chance and Unpredictability; ED=Environmental Determinism; MR=Moral Responsibility. SECS = Social and Economic Conservatism Scale; SDO = Social Dominance Orientation; RWA = Right-wing Authoritarianism.

AUTHORITARIANISM AND BELIEF IN DETERMINISM

Table 7. *Correlations among outcomes in Study 3.*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. ACT Authoritarianism	—										
2. ACT Conventionalism	.84**	—									
3. ACT Traditionalism	.80**	.81**	—								
4. SVSS Power	.10	.08	.09	—							
5. SVSS Self- direction	-.39**	-.44**	-.43**	-.27**	—						
6. SVSS Conformity	.49**	.59**	.54**	-.06	-.44**	—					
7. HEXACO H	-.15**	-.08	-.06	-.53**	.18**	.03	—				
8. HEXACO E	.08	.07	.09	-.15**	-.13*	.06	.03	—			
9. HEXACO X	.12*	.13*	.12*	.03	-.10	.07	.02	-.08	—		
10. HEXACO A	-.09	.00	-.07	-.27**	-.01	.05	.30**	-.04	.27**	—	
11. HEXACO C	.03	.05	.03	-.19**	.15**	.03	.25**	.03	.19**	.16**	—
12. HEXACO O	-.46**	-.51**	-.48**	-.15**	.36**	-.43**	.14**	-.05	.17**	.21**	.19**

Note. * indicates $p < .05$. ** indicates $p < .01$. ACT = Authoritarianism, Conventionalism, Traditionalism scales; SVSS = Schwartz Values Survey – Short Form; H = Honesty-humility; E = Emotionality; X = Extraversion; A = Agreeableness; C = Conscientiousness; O = Openness.

Table 8. Zero-order correlations of the FAD+ factors with outcome variables for Study 3.

Variables	M (SD)	FD	GD	ED	C & UP	MR	FW
		<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
ACT Aggression	26.98 (9.23)	.32	.19	-.08	.06	.29	.31
ACT Conventionalism	25.88 (9.08)	.36	.21	-.08	-.07	.23	.27
ACT Traditionalism	24.50 (9.87)	.36	<i>.15</i>	-.07	-.09	.21	.23
SVSS Power	-1.96 (2.08)	.20	.24	<i>.16</i>	.06	-.18	-.20
SVSS Self-direction	1.51 (1.53)	-.29	<i>-.15</i>	.09	.08	.02	.00
SVSS Conformity	-1.21 (2.15)	.20	.10	-.12	<i>-.15</i>	.11	<i>.13</i>
HEXACO H	3.43 (.72)	<i>-.14</i>	-.26	<i>-.20</i>	-.18	<i>.14</i>	.12
HEXACO E	3.17 (.64)	<i>.12</i>	<i>.16</i>	.12	.08	-.03	.03
HEXACO X	3.04 (.72)	-.07	-.12	<i>-.17</i>	-.19	.21	.28
HEXACO A	3.32 (.75)	-.09	-.26	<i>-.18</i>	-.08	.01	.10
HEXACO C	3.83 (.61)	-.29	-.26	-.13	-.18	.30	.27
HEXACO O	3.63 (.73)	-.24	-.16	.11	.03	-.02	-.05

Note. N=389. **Bolded** denotes $p < .01$. *Italicized* denotes $p < .05$. FD=Fatalistic Determinism; GD=Genetic Determinism; FW=Free Will; E & UP=Chance and Unpredictability; ED=Environmental Determinism; MR=Moral Responsibility.

Table 9. *Mini meta-analytic results.*

	<i>k</i>	<i>N</i>	FD		GD		ED		UP		FW		MR	
			<i>r</i>	95% CI	<i>r</i>	95% CI	<i>r</i>	95% CI						
RWA														
ACT Aggression	2	898	.34	 [.28, .39]	.22	 [.15, .28]	-.01	[-.15, .13]	<i>.07</i>	<i> [.01, .14]</i>	.34	 [.28, .39]	.34	 [.25, .42]
ACT Conventionalism	2	898	.36	 [.30, .41]	.21	 [.15, .27]	.00	[-.15, .16]	.01	[-.14, .15]	.32	 [.23, .40]	.29	 [.17, .41]
ACT Traditionalism	2	898	.33	 [.27, .39]	.15	 [.09, .21]	-.02	[-.12, .08]	-.06	[-.12, .01]	.27	 [.19, .35]	.26	 [.17, .34]
RWA Scale	2	1562	.36	 [.31, .40]	.01	[-.35, .37]	-	-	-.08	[-.22, .07]	.26	 [.21, .31]	.31	 [.11, .48]
Combined*	8	1981	.35	 [.27, .43]	.12	 [.04, .21]	-.02	[-.11, .06]	-.03	[-.12, .05]	.29	 [.21, .37]	.30	 [.21, .38]
SDO Dominance														
	2	1141	.22	 [.17, .27]	.19	 [.13, .24]	-	-	-.01	[-.06, .05]	.02	[-.04, .08]	.09	[-.11, .28]
Need for Closure														
	2	1045	.19	 [.08, .30]	.13	[-.12, .36]	-	-	.09	[-.08, .26]	<i>.14</i>	<i> [.01, .26]</i>	.19	 [.12, .26]
Political Ideology														
Economic	2	5478	.03	[-.07, .13]	-.10	[-.29, .10]	-	-	<i>-.1</i>	<i> [-.24, -.03]</i>	.33	 [.29, .37]	.41	 [.24, .55]
Social	2	5478	.27	 [.24, .29]	-.04	[-.40, .32]	-	-	-.12	 [-.20, -.05]	.29	 [.23, .36]	.38	 [.28, .47]
HEXACO														
Honesty-Humility	2	898	-.13	 [-.19, -.06]	-.22	 [-.29, -.15]	-.17	 [-.23, -.10]	-.15	 [-.22, -.09]	<i>.11</i>	<i> [.04, .17]</i>	<i>.11</i>	<i> [.04, .17]</i>
Emotionality	2	898	.16	 [.08, .24]	.14	 [.07, .20]	.08	[.01, .15]	.11	 [.05, .18]	-.01	[-.09, .07]	-.01	[-.09, .07]
Extraversion	2	898	-.15	 [-.30, .01]	-.15	 [-.22, -.09]	-.13	 [-.21, -.05]	-.21	 [-.27, -.14]	.30	 [.24, .36]	.30	 [.24, .36]
Agreeableness	2	898	-.10	 [-.16, -.03]	-.22	 [-.30, -.14]	-.15	 [-.22, -.09]	-.13	 [-.21, -.04]	.16	 [.04, .28]	.16	 [.04, .28]
Conscientiousness	2	898	-.28	 [-.34, -.22]	-.25	 [-.31, -.19]	-.13	 [-.19, -.07]	-.15	 [-.22, -.09]	.25	 [.19, .31]	.25	 [.20, .31]
Openness	2	898	-.26	 [-.32, -.19]	-.18	 [-.24, -.11]	.01	[-.17, .20]	-.01	[-.09, .07]	-.04	[-.11, .02]	-.05	[-.11, .02]

Note. *Ns* = number of unique participants; *k* = number of effect sizes; *denotes three-level meta-analytic model. **Bolded** denotes statistical significance at $p < .001$. *Italicized* denotes statistical significance at $p < .01$.