

# Populism Versus Science in Competitive Authoritarian Regimes

Kursat Cinar<sup>1</sup>  and Tekin Kose<sup>2</sup>

<sup>1</sup>Department of Political Science & Public Administration, Middle East Technical University, Turkey

<sup>2</sup>School of Business & Law, University of Brighton, UK

All correspondence concerning this article should be addressed to Kursat Cinar. Email: [kursatc@metu.edu.tr](mailto:kursatc@metu.edu.tr)

## Abstract

This article explores the linkage between populist, authoritarian tendencies among citizens and people's dispositions toward the scientific community. It particularly focuses on competitive authoritarian (CA) countries. The article underlines the commonalities between populism and competitive authoritarianism and aspires to explore the inclinations of the voters of populist incumbent parties in competitive authoritarian regimes. In light of an empirical analysis that covers more than 10,000 participants in competitive authoritarian regimes from 9 countries throughout the world, the article examines the correlates of people's viewpoints about science in CA countries. The findings strongly suggest that supporters of populist incumbent parties are more likely to hold reservations about science. We also find that the supporters of strongly populist parties in CA regimes are less likely to have optimistic viewpoints about science.

## Introduction

Populism is on the rise in many corners of the world (Akkerman, Mudde, & Zaslove, 2014; Aytac & Öniş, 2014; Caramani, 2017; Kaltwasser, Taggart, Espejo, & Ostiguy, 2017; Laclau, 2007; Levitsky & Loxton, 2013; Mudde & Kaltwasser, 2017; Roberts, 1995; Schulz et al., 2018; Weyland, 1996, 2001). So are hybrid regimes, with increasing instances of democratic backsliding and autocratization in several nations and regions (Bogaards & Elischer, 2016; Cameron, 2018; Castaldo, 2018; Diamond, 2002; Esen & Gumuscu, 2016; Levitsky & Loxton, 2013; Levitsky & Way, 2002, 2020; Vladisavljević & Krstić, 2022). In many of these nations, we observe a growing double wave of both populist movements as well as hybrid regimes in the form of competitive authoritarian structures, in which incumbent parties unfairly tilt the electoral competition against their opponents. While there are many valuable studies on each of these two important concepts (i.e., populism and competitive authoritarianism), there is still a fertile ground for research about the intersectionalities between these concepts (we discuss the commonalities and differences of the concepts in great detail in our literature review). This article aims to shed light on these commonalities by particularly focusing on the demand side of populism and competitive authoritarianism as to how supporters of populist incumbent parties in competitive authoritarian regimes tackle salient issues for the public (for some illuminating works on this issue, see Eberl, Huber, Mede, & Greussing, 2023; Kaltwasser & Van Hauwaert, 2020; Schulz et al., 2018; Spruyt, Keppens, & Van Droogenbroeck, 2016; Van Kessel, Sajuria, & Van Hauwaert, 2021).

Particularly, the article delves into competitive authoritarian regimes, in which these populist incumbents could

create stronger ties with their electorate and hence could sway their supporters toward their anti-establishment rhetoric, including those related to science and scientific communities. In those competitive authoritarian polities, populist leaders perceive scientists as part of the elite structure, which challenges their authority and hence their legitimization claims. Thus, the populist leaders and their supporters in competitive authoritarian regimes often attack the scientific community by claiming to be part of the “corrupt elites” against the “will of the people.” Our article particularly focuses on this intertwined relationship between competitive authoritarianism, populism, and science and hence aims to contribute to our understanding regarding these important concepts.

Based on a diverse selection of cases that incorporates competitive authoritarian regimes and their populist ruling parties throughout the globe, our article focuses on the viewpoints of these incumbent political parties' constituencies regarding science and scientific communities. How is support for incumbent leaders in competitive authoritarian regimes associated with anti-scientific attitudes? Does populism in these political regimes hinder pro-science attitudes among the electorate? These are the questions we specifically aim to explore in our article.

The structure of the article is as follows: In the next section, we go over the central concepts of competitive authoritarianism and populism and how these could affect people's sentiments toward science based on an extensive literature review. The following section presents our main variables, data sources, and methodology. The succeeding section illustrates our empirical findings, especially on the relationship between supporting populist incumbent parties and holding anti-science sentiments. The final section concludes.

## Literature Review: Competitive Authoritarianism, Populism, and Science

This article draws commonalities between the notions of competitive authoritarianism and populism and how the two notions pit against science and scientific communities throughout the world. To do so, it first explores these central concepts in light of the relevant literature, starting with competitive authoritarian (CA) regimes.

The concept of competitive authoritarianism (CA) has been developed in the new millennium to better analyze hybrid regimes throughout the world after the end of the Cold War (Levitsky & Way, 2002). As Bunce and Wolchik aptly suggest, “one of the most striking outcomes of the third wave of democratization has been the proliferation of competitive authoritarian regimes” in the world (Bunce & Wolchik, 2010, p. 43). The CA regimes refer to those polities in which democratic competition partially exists, yet incumbents’ abuse of power significantly skews the playing field against opponents (Bogaards & Elischer, 2016; Levitsky & Way, 2002, 2010). Levitsky and Way’s most recent research on competitive authoritarianism underlines that despite some changes in the cases, the number of CA regimes has remained relatively steady over the last quarter-century and there are more than 30 competitive authoritarian regimes throughout the world as of 2019 (Levitsky & Way, 2020, pp. 51–52). The term has traveled extensively across the globe theoretically and empirically in light of numerous cases and can be observed in many regions, including Latin America, Sub-Saharan Africa, East-Central Europe, Asia, and the Middle East (Bogaards & Elischer, 2016; Cameron, 2018; Castaldo, 2018; Esen & Gumuscu, 2016; Levitsky & Loxton, 2013; Levitsky & Way, 2020; Vladislavljević & Krstić, 2022).

The waning power of Western liberal hegemony, declining international linkage, and leverage of both the EU and the US, as well as the rising role of more authoritarian nations of China and Russia, have changed the international political arena in recent years, all of which have enabled more autocratic forms of governance such as competitive authoritarian regimes to flourish and persist. The CA regimes contain a geographically diverse set of nations, which are also analyzed in this article, including Bangladesh, Bolivia, Kenya, Serbia, and Turkey.

The growth of competitive authoritarian regimes in the world coincides with the rise of another important concept, which is populism. As Mudde and Kaltwasser aptly suggest, “populism is one of the main political buzzwords of the 21st century” (Mudde & Kaltwasser, 2017, p.1). While the term “populism” is often used rather pejoratively in today’s world (Kaltwasser et al., 2017), the earliest usages of the concept in the examples of People’s Party in the US and the *narodniki* movement in Russia in the late 19th century draw a different portrayal of the term, with an emphasis on the mobilization of the masses against the established elites of the time (Mudde, 2017; Postel, 2007). The term “populism” later evolved into its classical examples in Latin America in the post-Great Depression Era after the 1930s, with prime examples of the Peronist Party (PJ) and its leader Juan Domingo Perón in Argentina and Getúlio Vargas in Brazil (Kaltwasser et al., 2017; Roberts, 1995; Weyland, 1996). More contemporary examples of populism enmeshed with the neoliberal world order can be found all around the world. This is the case for many developing and developed nations, as well

as established and non-consolidated democracies (Laclau, 2007; Levitsky & Loxton, 2013; Mudde & Kaltwasser, 2017; Weyland, 2001).

In Laclau terms, the conceptualization of the term “populism” boils down to the issue of the “nature and logics of the formation of collective identities.” In his understanding, populism is “a way of constructing the political” (Laclau, 2007, p. xi). To this end, a populist political leader would appeal to the masses, which is mostly based on subaltern groups of society, aim to create direct, personalistic, and paternalistic/maternalistic ties to these underprivileged groups, and try to bypass established intermediary organizations (such as civil society organizations and labor unions) (Levitsky & Loxton, 2013; Roberts, 1995; Weyland, 1996). The top-down political mobilization of populist leaders is intentionally based on an eclectic, thin-centered ideology. Furthermore, populism, by its nature, is anti-elitist and anti-institutional (Aytaç & Öniş, 2014; Levitsky & Loxton, 2013; Mudde & Kaltwasser, 2017; Weyland, 2001).

The radical approach to populism argues that populism can help achieve radical democracy by reintroducing conflict into politics and fostering the mobilization of excluded sectors of society with the aim of changing the status quo (Laclau, 2007; Mouffe, 2018). However, other scholars would assume an ideational approach to study populism, which we also agree with and apply in this article (Abts & Rummens, 2007; Aytaç & Öniş, 2014; Kaltwasser et al., 2017; Mudde & Kaltwasser, 2017; Weyland, 1996, 2001). Based on this ideational conceptualization of populism, populism stands on three main pillars: (a) “the people,” which is a construction or an “empty signifier” that stands as the main sovereign in a nation that should rule above all; (b) “the elite,” which stands in the way of the people and represents the bad side of the dual, Manichean nature of populism against the pure “people”; and (c) “the general will,” which is against the particularistic demands of individuals (*volonté de tous*) and should be enforced for society’s common interest and well-being (Mudde, 2017; Mudde & Kaltwasser, 2017; Schulz et al., 2018).

Based on the ideational approach, which we also adopt in this article, populism creates a clear contrast to pluralism. According to pluralism, society is divided into a broad variety of partly overlapping social groups with different ideas and interests (Abts & Rummens, 2007; Mudde & Kaltwasser, 2017). Within pluralism, diversity is seen as a strength rather than a weakness. This is a clear juxtaposition to populism’s aim to create and enforce the “general will of the people” (*volonté générale* à la Rousseau), which can be totalizing and anti-pluralist at many times. In other words, the monist core of populism, and especially its notion of the “general will” may well lead to the support of authoritarian tendencies. At its core, populism with its “unitary, non-pluralist, unmediated, and unaccountable vision of society’s general interest” (Caramani, 2017) pits against pluralist notions of democracy (Akkerman et al., 2014).

As experts suggest, while populism weakens liberal institutions, it pushes democracies into competitive authoritarianism (Levitsky & Loxton, 2013; Levitsky & Way, 2020). These scholars underline the clear linkage between populism and competitive authoritarianism. The rise and success of populist leaders and parties play a role in the emergence and the resilience of the CA regimes (Levitsky & Way, 2020). In many diverse settings including Hungary, Turkey, and Thailand, the emergence of populist leaders coincides with the upsurge of

competitive authoritarianism via the removal of democratic restraints on the executive, manipulation of the electoral system, and curtailment of the democratic space available to the opposition (Esen & Gumuscu, 2016).

Experts on the field argue that populist tendencies, which are reflected in the election of a personalistic leader that mobilizes voters with an anti-establishment appeal, are a major catalyst for the CA regimes. As they maintain, populist leaders are usually “outsiders,” who have an electoral mandate to reform the existing system and often face hostile institutions dominated by the traditional parties. Hence, these leaders tend to convert weak democracies into competitive authoritarian regimes to gain the upper hand in electoral competition (Bogaards & Elischer, 2016; Levitsky & Way, 2010). Moreover, the plebiscitarian nature of populism goes very well with the uneven electoral competition in the CA regimes (Cameron, 2018). Furthermore, the existing studies maintain that populist sentiments and rhetoric by ruling parties would be reinforced and would much more strongly echo in the masses in competitive authoritarian settings (Castaldo, 2018; Levitsky & Loxton, 2013; Vladislavljević & Krstić, 2022).

What we call the “global double wave of competitive authoritarianism and populism” coincides with attacks on scientific expertise and scientific communities in many countries. Anti-intellectualism is clearly connected to increasing populism, which sets up a rift between ordinary citizens and privileged societal elites, including scientists (Merkley, 2020). While their sphere of influence in forming public opinion and state policies largely varies in present-day society, scientists are regularly perceived to be a part of elites in many countries, including those ruled by populists (Kubalskyi, 2023). In numerous cases, populist leaders attack scientific experts and even label them as traitors (Collins, Evans, Durant, & Weinelt, 2020; Rraggio, 2022). As part of their communication tactics and rhetoric, populist leaders usually blame scientific communities and scientists to fuel disenchantment and cynicism towards scientists regarded as part of the “corrupt” elites (Hameleers & Van der Meer, 2021). According to populist leaders, scientists are allegedly linked with international, “foreign” powers, stand against the popular will with their technocratic claims, and pit their scientific reasoning against “folk wisdom” and populists’ immediate political action (Bellolio, 2022). Moreover, since scientific expertise creates an additional layer of checks and balances and vertical accountability mechanisms, populists often choose to attack scientific communities just as they attack other checks and balances mechanisms (Collins et al., 2020).

Based on this information, scholars have started to assert that populist criticism of societal institutions, including scientific communities has only recently attracted public and scholarly attention, especially on the demand side of populism (i.e., among the electorate) (Eberl et al., 2023). Some experts have started to explore who supports populism and under what circumstances (Akkerman et al., 2014; Schulz et al., 2018; Spruyt et al., 2016; Van Kessel et al., 2021). Yet, many scholars maintain that there is still dearth of research about the specific characteristics and attitudes of “populist citizens” (Eberl et al., 2023; Kaltwasser & Van Hauwaert, 2020).

As experts aptly argue, negative dispositions toward not just political elites but also social elites including scientists by populist citizenry have serious implications for the well-functioning of democratic societies. Adverse implications of such dispositions include fierce and unsubstantiated reactions

toward scientists, their knowledge and recommendations (as was clearly the case during the coronavirus disease 2019 (COVID-19) pandemic) and overall lowered legitimacy of scientific expertise within society (Bellolio, 2022; Eberl et al., 2023). Especially in non-consolidated, hybrid regimes (which our article particularly focuses on), such widespread negative dispositions by populist citizens toward social elites may “undermine governmental effectiveness, weaken institutions, erode faith in democracy, and lead to crisis and breakdowns” (Kaltwasser & Van Hauwaert, 2020, p.7). Hence, it is vital to focus on the linkage between populism and science to better understand the possible societal and political implications of negative dispositions of populist citizens towards scientific communities.

There is still a gap in the literature regarding people’s sentiments towards science and scientific communities in different polities. On the one hand, experts argue that in growingly affluent societies there would be thriving rates of secularization and thus rising levels of scientific optimism among citizens (Inglehart, 2018). This is evinced by empirical scholarly works especially related to well-off nations and particularly those citizens with high educational attainment in these nations (Lee 2022; Nisbet & Nisbet, 2019).

On the other hand, researchers argue that there is increasing public resentment and reservations toward scientific institutions in many parts of the world. Preference of religion over scientific expertise, moral resentment toward scientists, and disinterest in scientific knowledge manifest themselves across the world (Lee, 2022; Nisbet et al., 2002; Rutjens et al., 2022). This is further manipulated by populist sentiments and rhetoric (Bellolio, 2022; Eberl et al., 2023).

There is still a gap in the literature that would address the notions of both scientific optimism and scientific reservations under different political settings, including the intersectionalities in the competitive authoritarianism-populism nexus. Since these regimes have major commonalities across the board politically, it would be wise to gather them empirically and analyze the effects of competitive authoritarianism and populism on science and scientific communities to contribute to the literature in these areas, which is what this article aspires to do. Based on this extensive literature review, here are our hypotheses regarding the linkage between competitive authoritarianism, populism, and science:

**H1:** The supporters of populist, incumbent parties in competitive authoritarian regimes will be less disposed to hold optimistic viewpoints about science.

**H2:** The voters of populist, incumbent parties in competitive authoritarian regimes will be more inclined to have reservations toward science.

We test our hypotheses via thorough empirical tests based on the internationally respected World Values Survey (WVS) and the Global Party Survey. In the next section, we discuss our data and methodology in detail.

## Data and Methodology

### Data and Variables

To determine the micro-level correlates of scientific optimism and scientific reservations in competitive authoritarian, populist regimes, this study first utilizes the most recent (7th) wave of the World Values Survey (Haerper et al., 2022). This



wave was conducted between 2017 and 2022 in 64 countries. The survey uses representative samples from the participating countries by face-to-face interviews. We determine our sample of competitive authoritarian (CA) countries by utilizing Levitsky and Way's most recent classification of the CA regimes (Levitsky & Way, 2020). The 7th wave of the WVS provides data for nine of the CA countries: Bangladesh, Bolivia, Kenya, Kyrgyzstan, Nigeria, Philippines, Serbia, Turkey, and Zimbabwe. To this end, our dataset covers a total of 12,846 individuals and ensures representation of a diverse selection of cases across the globe. [Supplementary Tables S1 and S2](#) present valuable information on the number of respondents and time of survey across countries, as well as the descriptive statistics for all variables of interest at the individual and country levels.

The WVS survey collects information on the preferences of individuals for science and scientific communities. Earlier research considers two dimensions of public attitudes for science (Nisbet & Nisbet, 2019; Nisbet et al., 2002). In a similar fashion, we consider survey questions in science and technology section of the WVS to construct two dependent variables of our study: (1) scientific optimism and (2) scientific reservations<sup>1</sup>.

First, we construct an index for scientific optimism by utilizing three questions from the WVS. This index combines the agreement levels of individuals for the following statements: (1) *Science and technology are making our lives healthier, easier, and more comfortable (Q158 in WVS)*; (2) *Because of science and technology, there will be more opportunities for the next generation (Q159 in WVS)*; (3) *All things considered, would you say that the world is better off, or worse off, because of science and technology? (Q163 in WVS)*. These measures rely on a 10-point Likert scale of agreement (1 = *completely disagree* to 10 = *completely agree*). Therefore, higher values indicate higher optimism toward science. We employ principal component factor analysis (PCFA) to build up our dependent variable for science optimism. According to our results from the PCFA, the above-mentioned measures on scientific optimism load into a single factor with a Cronbach's alpha of 0.71 and factor loadings of 0.86, 0.84, and 0.71, respectively. We also rescale our measure of science optimism such that it ranges from 1 (lowest level of optimism) to 10 (highest level of optimism), for the sake of clarity and comparability.

We further consider three questions about the anti-science views of individuals to construct our dependent variable for scientific reservations. This dependent variable is an index that combines the agreement levels of individuals for the following statements: (1) *We depend too much on science and not enough on faith (Q160 in WVS)*; (2) *One of the bad effects of science is that it breaks down people's ideas of right and wrong (Q161 in WVS)* (3) *It is not important for me to know about science in my daily life (Q162 in WVS)*; each question relies on a 10-point scale of agreement for a statement (1 = *completely disagree* to 10 = *completely agree*).

<sup>1</sup> For the relevant six items on science and technology that we discuss in detail below, we first run principal component factor analysis (PCFA) including all six items. Factor analysis indicates that these items indeed load onto two different scales with eigenvalues of 1.975 and 1.454. Moreover, items for scientific optimism are clustered for Factor 1 with loadings of 0.845, 0.833, and 0.697, respectively. Items for scientific reservations are clustered for Factor 2 with loadings of 0.718, 0.785, and 0.556, respectively. Hence, these results show that there are both theoretical and empirical supports for our classification of items for the scientific views of the public.

Hence, higher values of these variables would imply higher levels of anti-science preferences for individuals. We conduct PCFA to assess empirical support for constructing a composite index of scientific reservations. PCFA results indicate that our three dependent variables load into a single factor with a Cronbach's alpha of 0.45 and factor loadings of 0.73, 0.78, and 0.54, respectively. Like our scientific optimism index, we rescale our combined index for scientific reservations from 1 (the lowest) to 10 (the highest).

We observe that the computed Cronbach's alpha for the scientific reservations index is lower than the conventional boundaries for scale construction (Brown, 2015). However, our findings are consistent with earlier literature on public attitudes toward science. Analyzing the sixth wave of the WVS, Nisbet and Nisbet reports Cronbach's alpha of 0.55 for scientific reservations and 0.74 for scientific reservations (Nisbet & Nisbet, 2019). Hence, we proceed with separate analyses for each of our dependent variables.

The main independent variable of this study is the support of the respondent for the populist incumbent party in the corresponding country. As we have covered in the literature review, there is still dearth of research about the preferences and inclinations of populist voters (Eberl et al., 2023; Kaltwasser & Van Hauwaert, 2020). We aim to contribute to the studies in the populism-science nexus via the lens of competitive authoritarian regimes and aspire to explore whether the supporters of populist incumbent parties in the CA regimes have distinct viewpoints and stances toward science and scientific communities. To do so, we construct a dummy variable, *support populist incumbent*, based on the Q223 question of the WVS, which asks about the party that the individual would vote for if there were a national election tomorrow. If the respondent states that s/he would vote for the incumbent, then this variable has a value of one and otherwise zero. This variable would be pivotal to understand how supporters of incumbent, populist parties in competitive authoritarian regimes evaluate science and scientific communities. As stated before, we hypothesize that the supporters of populist, incumbent parties in competitive authoritarian regimes will be less disposed to hold optimistic viewpoints and will be more inclined to have reservations toward science.

To ensure reliable results and to prevent omitted variable bias, we introduce a battery of control variables based on the existing literature (Cinar & Ugur-Cinar, 2018; Collins et al., 2020; Eberl et al., 2023; Hameleers & Van der Meer, 2021). To this end, we include several control variables for gender, age, education, household income, left-right ideological views, religiosity, interpersonal trust, trust in social and political institutions. We construct a dummy variable for females (Q260 in WVS). Age is measured in years (Q262 in WVS). The education level of respondents is categorized into four major groups: no education, primary education, secondary education, and tertiary education (based on Q275 in WVS). Household income of individuals is measured through a 10-point scale from 1 (the lowest income group) to 10 (the highest income group) (Q228 in WVS). Left-right ideology scale indicates the political views of respondents via a 10-point scale, (1 = *Left* to 10 = *Right*) (Q240 in WVS). We construct an index to operationalize the religiosity levels of respondents by using PCFA. We include the importance of religion in life (Q6P in WVS), the frequency of an individual's attendance in religious services (Q171P in WVS), the frequency of pray for the individual (Q172P), and the subjective

**Table 1.** Scientific Optimism and Scientific Reservations Across Countries

Countries	Scientific optimism			Scientific reservations			Support for populist incumbent	
	N	Mean	Standard deviation	N	Mean	Standard deviation	N	Frequency %
Bangladesh	1,200	8.59	1.34	1,200	5.73	1.98	1,200	42.00
Bolivia	1,974	6.42	2.03	1,921	6.45	1.82	2,067	32.66
Kenya	1,247	7.19	2.05	1,233	5.70	1.95	1,266	18.17
Kyrgyzstan	1,150	8.40	1.98	1,123	5.82	2.43	1,200	26.25
Nigeria	1,219	7.62	2.12	1,207	5.41	2.05	1,237	37.27
Philippines	1,198	6.73	1.86	1,199	5.58	1.93	1,200	29.42
Serbia	996	7.35	2.05	979	5.54	2.23	1,046	28.97
Turkey	2,364	7.24	1.89	2,273	5.38	2.04	2,415	45.96
Zimbabwe	1,194	8.00	2.15	1,191	5.19	2.13	1,215	29.63

Sources: WVS Wave 7 and Levitsky and Way (2020).

religiousness level of the individual (Q173P) for the index of religiosity. Results of PCFA indicate a one-factor solution with a Cronbach's alpha of 0.61 and lead to factor loadings that are greater than 0.65. We rescale the religiosity index such that 1 indicates the lowest level and 10 indicates the highest level of religiosity. We also include a measure of social trust (Q57P) in our empirical analysis. This variable indicates the level of interpersonal trust for individuals (1 = *need to be very careful*; 2 = *most people can be trusted*). We also introduce control variables for people's confidence in different social and political institutions. Responses for confidence measures have four levels (1 = *none at all*; 2 = *not very much*; 3 = *quite a lot*; 4 = *a great deal*). We directly incorporate confidence in religious institutions (Q64P) and universities (Q75P) into our analysis. Finally, we consider a composite measure for confidence in representative political intuitions, that is, government (Q71P), political parties (Q72P), and parliament (Q73P). We conduct PCFA to construct an index for confidence in representative political institutions with three items. We obtain a single-factor solution with a Cronbach's alpha of 0.85 and all factor loadings greater than 0.86. This index is rescaled to range from 1 (the lowest confidence) to 4 (the highest confidence). The wide range of demographic, socioeconomic, and political control variables in light of the extant literature aim to prevent omitted variable bias to best measure the effects of voting for the populist incumbent parties in the CA regimes on people's viewpoints about science.

## Method

To measure the linkage between support for populist incumbent parties and the scientific optimism and scientific reservations of individuals, we utilize ordinary least squares (OLS) regressions with country-fixed effects. Since the WVS covers multiple countries, we need to account for variations in the characteristics of the countries in our sample. Due to the relatively low number of CA countries in our sample, we can neither add country-level control variables nor consider multilevel frameworks in our empirical models (such models do not converge empirically). Yet, the OLS framework with country-level fixed effects would still allow us to control all characteristics that are specific to each country. The inclusion of country-fixed effects would help us reduce potential biases in empirical findings. Hence, our regression models include

country-fixed effects and they are estimated with robust standard errors.

## Empirical Findings

We report descriptive statistics and sample characteristics in [Supplementary Tables S1](#) and [S2](#). The mean values of scientific optimism and scientific reservations are 7.41 and 5.67, respectively for the full sample. [Supplementary Table 2](#) reveals that the majority of the individuals in our sample reside in strongly populist countries (see [Norris 2020](#); please refer to the relevant discussion on the level of populism and its empirical reflections below).

Country-level descriptive measures are presented in [Table 1](#). According to [Table 1](#), Bangladesh displays the highest average (8.59) for scientific optimism, whereas Bolivia has the lowest average (6.42). The highest and lowest mean values of scientific reservations are observed in Bolivia (6.45) and Zimbabwe (5.19), respectively. [Supplementary Table S1](#) reports that on average 34% of respondents support the populist incumbent party in their countries. [Table 1](#) displays that the highest frequencies of support for the populist incumbent are observed in Turkey (45.96%) and Bangladesh (42%). The countries with the lowest frequency of support for the populist incumbent parties are Kenya (18.17%) and Kyrgyzstan (26.25%).

We report estimates from our OLS models in [Table 2](#). *F*-test results imply that all regression models in [Table 2](#) are overall significant. All models are estimated with robust standard errors, and there are no multicollinearity problems since variance inflation factors (VIFs) are lower than the threshold of 10.

Based on the results in [Table 2](#), there is no strong empirical support for Hypothesis 1 in our full sample since the coefficients of supporting populist incumbent ( $\beta_1 = -0.04, p > 0.1$ ;  $\beta_2 = -0.02, p > 0.1$ ) are not significant for scientific optimism (Models 1 and 2). On the other hand, findings from Models 3 and 4 provide empirical evidence in favor of Hypothesis 2. Scientific reservations are positively and significantly associated with indicators of support for populist incumbents ( $\beta_3 = 0.22, p < .01$ ;  $\beta_4 = 0.18, p < .01$ ). It is evident that voters who support populist, incumbent parties in the CA regimes have higher scientific reservations. This is the case even if we

**Table 2.** Ordinary Least Squares Regressions with Country Fixed-Effects: Full Sample

	<i>Scientific optimism</i>		<i>Scientific reservations</i>	
	Model 1	Model 2	Model 3	Model 4
Support populist incumbent	-0.04 (0.04)	-0.02 (0.04)	0.22*** (0.05)	0.18*** (0.04)
Female	-0.11*** (0.04)	-0.11*** (0.04)	0.06 (0.04)	0.07* (0.04)
Age/100	-0.38*** (0.15)	-0.36*** (0.13)	0.00 (0.15)	0.18 (0.15)
Education level (reference = early childhood or no education)				
Primary education	0.22*** (0.08)	0.21*** (0.08)	-0.15* (0.08)	-0.12 (0.08)
Secondary education	0.26*** (0.08)	0.27*** (0.08)	-0.17** (0.08)	-0.14* (0.08)
Tertiary education	0.41*** (0.09)	0.45*** (0.09)	-0.31*** (0.09)	-0.25*** (0.09)
Household income scale	0.06*** (0.01)	0.06*** (0.01)	0.04*** (0.01)	0.04*** (0.01)
Left-right ideology scale	0.07*** (0.01)	— —	0.03*** (0.01)	— —
Religiosity level	-0.05*** (0.02)	-0.03** (0.01)	0.08*** (0.02)	0.07*** (0.02)
Social trust	0.01 (0.06)	0.01 (0.06)	0.11 (0.07)	0.09 (0.07)
Confidence in religious organizations	0.03 (0.03)	0.06** (0.02)	0.09*** (0.03)	0.07*** (0.02)
Confidence in universities	0.20*** (0.03)	0.19*** (0.03)	-0.07** (0.03)	-0.06** (0.03)
Confidence in representative political institutions	0.09*** (0.03)	0.11*** (0.03)	0.04 (0.03)	0.04 (0.03)
Constant	7.18*** (0.22)	7.42*** (0.20)	4.16*** (0.23)	4.49*** (0.22)
R <sup>2</sup>	0.14	0.14	0.05	0.04
F	102.04***	108.45***	28.70***	26.99***
Mean (max) VIF	1.99 (4.07)	2.11 (4.54)	1.98 (4.06)	2.11 (4.54)
N (individuals)	9,524	11,203	9,441	11,084
N (country)	8	9	8	9

Notes: (1) Unstandardized coefficients are reported. (2) Robust standard errors are in parentheses. (3) \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$ . (4) Models 2 and 4 include data from Kyrgyzstan.

Source: WVS Wave 7.

control for important factors such as age, gender, household income, education level, political disposition on the ideological spectrum, social trust, and confidence in social and political institutions. These results give important insights about the viewpoints of citizens that support populist incumbent parties on science and scientific communities (cf. Bellolio, 2022; Eberl et al., 2023; Lee, 2022; Nisbet et al., 2002; Rutjens et al., 2022).

For further and more robust analyses, we consider subgroups of countries by accounting for the populism levels of ruling parties in the corresponding countries. To do so, we use the Global Party Survey's *Type\_Populism* variable (Norris, 2020), which is an ordinal variable (ranging between 1 and 4), which measures political parties in the pluralism–populism

spectrum (1 indicates strongly pluralist parties, 2 moderately pluralist parties, 3 moderately populist parties, and 4 strongly populist parties). This variable is perfectly in line with our theoretical construct of populism, which is based on the ideational approach that juxtaposes populism with pluralism. In light of this typology, as expected, all of the incumbent parties in the CA regimes are found to be populist as well. To better measure the effects of divergent levels of populism, we construct two groups of incumbent political parties ruling in the CA regimes: (1) moderately populist incumbent parties (in Bolivia, Kenya, and Nigeria) and (2) strongly populist incumbent parties (in Bangladesh, Kyrgyzstan, Philippines, Serbia, Turkey, and Zimbabwe). Estimation results for these country groups are presented in Table 3. Table 3 reports the

**Table 3.** Ordinary Least Squares Regressions with Country Fixed-Effects: Strong Populism Versus Moderate Populism

	Countries with strongly populist ruling parties				Countries with moderately populist ruling parties	
	Scientific optimism		Scientific reservations		Scientific optimism	Scientific reservations
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Support populist incumbent	-0.12** (0.05)	-0.06 (0.05)	0.29*** (0.06)	0.23*** (0.05)	0.08 (0.08)	0.12* (0.07)
Female	-0.00 (0.05)	-0.01 (0.04)	0.04 (0.05)	0.08 (0.05)	-0.30*** (0.07)	0.08 (0.06)
Age/100	-0.40** (0.17)	-0.32** (0.15)	0.03 (0.19)	0.30* (0.18)	-0.48* (0.28)	0.01 (0.25)
Education level (reference = early childhood or no education)						
Primary education	0.16* (0.09)	0.15* (0.08)	-0.10 (0.09)	-0.06 (0.09)	0.35** (0.16)	-0.25* (0.15)
Secondary education	0.26*** (0.10)	0.27*** (0.09)	-0.16 (0.11)	-0.14 (0.10)	0.29* (0.16)	-0.19 (0.15)
Tertiary education	0.43*** (0.10)	0.52*** (0.10)	-0.38*** (0.12)	-0.29** (0.11)	0.37** (0.18)	-0.23 (0.16)
Household income scale	0.06*** (0.01)	0.05*** (0.01)	0.03** (0.01)	0.03** (0.01)	0.06*** (0.02)	0.05*** (0.02)
Left-right ideology scale	0.08*** (0.01)	–	0.01 (0.01)	–	0.05*** (0.01)	0.05*** (0.01)
Religiosity level	-0.06*** (0.02)	-0.04** (0.02)	0.08*** (0.02)	0.07*** (0.02)	-0.02 (0.03)	0.08*** (0.03)
Social trust	0.25*** (0.08)	0.22*** (0.07)	0.24** (0.09)	0.18** (0.09)	-0.34*** (0.11)	-0.05 (0.11)
Confidence in religious organizations	-0.09** (0.04)	-0.02 (0.03)	0.17*** (0.04)	0.12*** (0.04)	0.14*** (0.04)	0.01 (0.03)
Confidence in universities	0.28*** (0.04)	0.26*** (0.03)	-0.11*** (0.04)	-0.12*** (0.04)	0.11*** (0.04)	-0.02 (0.04)
Confidence in representative political institutions	0.21*** (0.04)	0.20*** (0.04)	0.04 (0.04)	0.06 (0.04)	-0.08 (0.05)	0.05 (0.05)
Constant	6.83*** (0.26)	7.08*** (0.23)	4.00*** (0.30)	4.29*** (0.27)	5.79*** (0.36)	5.41*** (0.33)
R <sup>2</sup>	0.16	0.14	0.03	0.03	0.09	0.07
F	85.84***	85.69***	10.92***	10.24***	24.78***	18.67***
Mean (max) VIF	1.89(3.38)	2.06(4.24)	1.89 (3.37)	2.06(4.25)	1.89(5.15)	1.89(5.12)
N (individuals)	5,792	7,153	5,748	7,080	3,732	3,693
N (country)	5	6	5	6	3	3

Notes: (1) Unstandardized coefficients are reported. (2) Robust standard errors are in parentheses. (3) \*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$ . (4) Models 2 and 4 include data from Kyrgyzstan.

estimation results of our empirical models based on the data from the nine countries. The data set for Kyrgyzstan does not include measures for political (left-right) ideology. Therefore, we also estimate models without this variable to include data from Kyrgyzstan. Our main findings are robust with respect to this modification.

In light of Table 3, empirical findings for countries with strongly populist ruling parties provides partial support for Hypothesis 1. In Model 1, we observe that supporting populist incumbent is negatively and significantly associated with

scientific optimism ( $\beta_1 = -0.12, p < .05$ ). This implies that supporters of incumbent populist parties are less likely to hold scientific optimism in strongly populist polities (cf. Lee, 2022; Nisbet & Nisbet, 2019). However, these results do not hold in the sub-sample of moderately populist incumbent parties (Model 5). Hence, Hypothesis 1 is only supported in a specific sub-sample of CA countries, that is, those countries ruled by strongly populist parties.

Table 3 also underlines that the relationship between supporting the incumbent populist party and holding scientific



reservations is much stronger in the cases of strong populism than in the cases with moderately populist incumbent parties. According to Table 3, supporters of strongly populist ruling parties are much more likely to have scientific reservations. The coefficients of supporting populist incumbents ( $\beta_3 = 0.29, p < .01$ ;  $\beta_4 = -0.23, p < .01$ ) are positively significant in Models 3 and 4. Moreover, Model 6 indicates that the positive association between science reservations and supporting populist incumbents ( $\beta_6 = 0.12, p < .1$ ) holds in moderately populist countries. These results provide empirical support for Hypothesis 2. This is especially the case for Models 3 and 4 in Table 3, which highlight the ideas of the followers of strongly populist, incumbent parties on public opinion about science. When we compare these results with the overall findings for the whole sample of competitive authoritarian regimes (in Table 2), we find that science reservations are much stronger in more populist settings, in which the ruling parties can influence their supporters in ways that would worsen their ties with science and the scientific community. Substantively speaking, our results suggest that we observe the highest statistical and substantive significances for our main explanatory variable (i.e., supporting populist incumbent parties in the CA regimes) in very strongly populist polities (Table 3). Our empirical results underline the importance of detailed analyses that explore the impact of divergent levels of populism on societies throughout the world (cf. Bellolio, 2022; Eberl et al. 2023).

In addition to our explanatory variable, some strong patterns emerge for our control variables based on the empirical models shown in Tables 2 and 3. In particular, while educational attainment and confidence in universities boost pro-science attitudes and diminish anti-science sentiments, individual-level religiosity does the opposite by lowering scientific optimism and increasing scientific reservations. All in all, our empirical analyses underscore that even after controlling for several demographic, socioeconomic, and political variables, supporting the incumbent political party in CA regimes stands to correlate with people's attitudes toward science, especially for their reservations regarding science and scientific communities.

## Concluding Remarks

This article has aimed to shed light on the relationship between populism and public opinion towards science. The paper has found that in competitive authoritarian settings, in which rulers could more heavily influence their supporters, populist leaders, and movements would downplay scientific authorities and would be associated with lowered levels of people's confidence in scientific communities. This is especially the case for the followers of incumbent populist parties. This tells us a lot about how populism and populist leaders could sway public opinion about science, especially in more restraining, authoritarian settings such as the CA regimes. The findings of the research are robust under several demographic, socioeconomic, and political controls and underline the significance of populist sentiments in influencing public opinion.

Our research has important political and social implications. Negative sentiments toward scientific authorities and lowered optimism for what science could bring for current and future generations would deteriorate the legitimacy of scientific expertise within society. This has indeed been the

case in many countries during the COVID-19 pandemic via several anti-vaccine campaigns and smear conspiracy theories. Particularly, populist leaders and their supporters try to discredit scientific authorities by pitting "popular will" against technocratic claims and downplaying scientific reasoning, which they argue to be inferior to folk wisdom in recent times. This situation is further hampered in semi-democratic settings. Our article has underlined that voters of populist parties in competitive authoritarian settings will be more inclined to have adverse viewpoints regarding scientific optimism and hold major reservations toward scientific communities. This is particularly the case for polities ruled by strongly populist parties. Such populist dispositions toward science and scientific communities, especially under competitive authoritarian regimes, would undermine scientific governmental policies, weaken political and social institutions, further lower confidence in democracy, and may even lead to societal crises. To this end, it is vital to understand the specific conditions through which populism could hinder science to better cope with its social and political repercussions.

As for any research, our research has also its limitations. First, since the scope condition for our study deals with the intersection between populism and competitive authoritarianism and their interaction with science, our research findings naturally apply to such polities only, and not beyond. Yet, we believe that the extensiveness of such polities throughout the world merits due diligence, which we have tried to give in our research. Second, while geographically wide-ranging, our sample of competitive authoritarian regimes is still limited due to data availability. Still, based on the most recent reviews in the literature, we cover almost one-third of competitive authoritarian regimes in the world. Third, data availability also dictated that we could not incorporate all of the control variables that exist in the literature on and for different polities from different data sources. Still, we have made sure that we have included all of the relevant and available demographic, socioeconomic, and political variables from the data sources that are at hand. Fourth and lastly, a wider coverage of countries based on further data availability could have enabled a multi-level approach, which would better capture the nested nature of the data at hand. All in all, given the constraints on data availability, we have ensured that we utilize the most extensive and representative samples at hand and offer highly reliable empirical analyses.

For future research, scholars may further delve into the sample of citizens that support populist, incumbent parties in light of different research techniques. To this end, quantitative as well as qualitative research techniques such as experiments, focus groups, and in-depth interviews could be very illuminating to understand the specific dynamics behind these people's viewpoints about science and scientific authorities. The sample of populist citizens throughout the world could also be extended and enhanced via better data coverage and representation. The populism-science nexus is a burgeoning field of study in the social sciences, and there are many ways to explore the relationship between these two phenomena and how they could affect public opinion in different socio-political settings.

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## Supplementary Data

Supplementary materials are available at *International Journal of Public Opinion Research* online.

## Biographical Notes

**Kursat Cinar** is an Associate Professor at Middle East Technical University, Department of Political Science and Public Administration. Dr. Cinar earned his PhD in Political Science from the Ohio State University. His research interests center on party politics, democratization, political institutions, development, and gender politics. Dr. Cinar's books titled *The Decline of Democracy in Turkey: A Comparative Study of Hegemonic Party Rule* (2019) and *Women's Empowerment in Turkey and Beyond* (Ed.) (2020) have both been published by Routledge Press. He has also published in several respected journals including *Democratization*, *Political Studies*, *Gender, Work & Organization*, *Social Politics*, *Politics and Gender*, *Political Science Quarterly*, *Social Indicators Research*, *The Social Science Journal*, *Journal of Gender Studies*, *South European Society & Politics*, *Turkish Studies*, *Southeast European and Black Sea Studies*, *Contemporary Politics*, *Mediterranean Politics*, and *Journal of Balkan and Near Eastern Studies*. Dr. Cinar is a Fulbright and EU Marie Curie Alumnus, an Associate Editor of *Southeast European and Black Sea Studies*, and an Editorial Board Member of *Turkish Studies*. (ORCID: 0000-0001-6044-2810)

**Tekin Kose** is a Lecturer Dr. at the University of Brighton, School of Business and Law. Dr. Kose obtained his PhD in Economics from the University of Pittsburgh. His research areas include applied microeconomics, health economics, gender economics, political economy, and applied econometrics. He has published in *South European Society & Politics*, *Political Science Quarterly*, *Social Indicators Research*, *The Social Science Journal*, *Applied Economics*, *PLoS One*, *Health Policy and Technology*, *International Journal of Conflict and Violence*, and *Computers in Human Behavior*. Dr. Kose teaches various economics courses and works on externally funded research projects. (ORCID: 0000-0002-0476-8872).

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