

Political Discontent in China is Associated with Isolating Personality Traits

[Short Title: Political Discontent and Personality in China]

[This version: September 27, 2021]

Rory Truex[†]

Abstract

Our personalities affect how we understand the political world, but research to date has focused almost exclusively on democratic contexts. How is personality related to political attitudes and behavior in authoritarian systems? Three original surveys of Chinese citizens ($N_{Study1} = 2024$, $N_{Study2} = 3573$, $N_{Study3} = 1986$) show that discontented citizens in contemporary China are more fearful, disagreeable, and introverted, lacking close emotional attachments to others. Conversely, CCP members show high levels of Extraversion and other traits associated with personal and professional success. These findings suggest a social element to regime support. China's most dissatisfied citizens operate at the fringes of society, which may contribute to the durability of authoritarian rule in the country.

Keywords: authoritarian; regime support; discontent; personality; China; HEXACO PI-R; Social Dominance Orientation (SDO)

[†]Assistant Professor of Politics and International Affairs, Princeton University, rtruex@princeton.edu. My gratitude goes to Doug Ahler, Kevin Arceneaux, Xun Cao, Elizabeth Carlson, Dan Chen, Tom Christensen, Charles Crabtree, Rafaela Dancygier, Adam Dynes, Sona Golder, Yue Hou, Junyan Jiang, Holger Kern, Neysun Mahboubi, Tianguang Meng, Jennifer Pan, Joseph Wright, Yiqing Xu, Boliang Zhu, and Yuanyuan Zeng for helpful feedback on various stages of the project. Sophie Li and Sadiki Wiltshire provided excellent research assistance. Any remaining errors are my own. Replication files are available in the JOP Data Archive on Dataverse (<http://thedata.harvard.edu/dvn/dv/jop>). The empirical analysis has been successfully replicated by the JOP replication analyst. Supplementary material for this article is available in the Su in the online edition.

Almost all citizens living under authoritarian rule acquiesce to their governments almost all of the time. The dominant action for the authoritarian citizen is not to overthrow the regime, it is to do nothing. Those that voice discontent and demand political reform are few and far between (Kuran 1991; Slater 2009).

Consider the cognitive work it takes to reject authoritarian rule. A citizen must override the very powerful, positive images painted by the regime, which have been fostered all her life by the media environment (Geddes and Zaller 1989; Huang 2015, 2018; King, Pan and Roberts 2017) and education system (Cantoni et al. 2017; Pop-Eleches and Tucker 2014). She must come to the viewpoint that she has been actively manipulated by her government, and that the regime's abundant supporters are wrong (Frye et al. 2017; Magaloni 2006; Treisman 2011; Wedeen 2015).

A long research tradition in authoritarian politics has explored the determinants of regime support. Core theoretical explanations center on the role of economic incentives (Magaloni 2006; Treisman 2011), exposure to propaganda (Geddes and Zaller 1989; Reuter and Szakonyi 2015), ethnic ties (Posner 2005), and membership in political parties and regime institutions (Blaydes 2010; Chen and Dickson 2008; Gandhi 2008; Kim and Gandhi 2010; Reuter and Robertson 2014). An overarching theme is that citizens with a personal financial, policy, or professional interest in regime success support the system more. Those that have been excluded from the regime are prone to discontent (Bueno de Mesquita et al. 2005; Gandhi 2008; Svobik 2012).

Existing research in political psychology has shown that personality is an important predictor of political attitudes and behavior (Gerber, Huber, Doherty and Dowling 2011). Personality traits have proven associated with activism (Gerber, Huber, Doherty, Dowling, Raso and Ha 2011), partisanship (Gerber et al. 2012), receptivity to "get out the vote" appeals (Gerber et al. 2013), willingness to discuss politics (Gerber et al. 2012), and innovativeness among officials (Hasmath, Teets and Lewis 2019, Lewis, Teets and Hasmath 2018), among other outcomes.

With the exception of recent work by Greene and Robertson (2017) and Hasmath, Teets and Lewis (2019), effectively all research on personality and politics has focused on democracies. As Henrich, Heine and Norenzayan (2010) succinctly put it, "Most people are not WEIRD" – reliance on research participants from Western, educated, industrialized, rich and democratic countries has led to a distorted understanding of psychology. The effects of personality on political attitudes are likely context-specific, depending on the social, political, and cultural environment of the individual in question (Gerber et al. 2010). Yet to date, we have not explored a particularly broad set of contexts. In their meta-analysis of 71 studies on personality and political attitudes, Sibley, Osborne and Duckitt (2012) count 34 from the United States, 11 from New Zealand, 10

from Belgium, 6 from Germany, 5 from Canada, and 1 each from Israel, Italy, Poland, Sweden, and Turkey.

This paper investigates the relationship between personality and discontent under authoritarianism, building on recent work by [Greene and Robertson \(2017\)](#). Because personality cannot be experimentally manipulated, our aim is a reliable, robust associational descriptive inference ([Gerring 2012](#)). At a personality level, what types of citizens are most critical of their governments? Are certain traits associated with dissatisfaction with authoritarian rule? If so, what are the consequences for politics in these systems?

I study these questions in contemporary China, a case of particular substantive and geopolitical importance. The Chinese Communist Party (CCP) has been in power since 1949, and existing research suggests the regime enjoys broad support from the population. China scholars have documented that most Chinese citizens tend to voice high levels of trust in the CCP and the central government in particular, which is viewed as virtuous and well-intentioned ([Dickson 2016](#); [Li 2004](#)). But no study to date has ever explored whether personality is systematically related to political attitudes and support for the CCP.¹

Three core hypotheses can be derived from existing research. First, existing studies imply that regime discontents would be citizens with a particular intellectual curiosity. Individuals with greater Openness to Experience express more liberal political views in democracies ([Gerber et al. 2010](#)), and we might expect this trait to fuel more critical thinking in authoritarian systems as well. High level of openness may lead citizens to seek out censored materials, visit foreign countries, and engage other nonconventional thinkers, among other behaviors ([Roberts 2018](#)). Such activities may erode support for authoritarianism and cause individuals to embrace a democratic alternative.

Second, the Agreeableness dimension of personality appears central to attitudes under authoritarianism, in a way that it is not under democracy ([Greene and Robertson 2017](#)). Individuals with high-levels of Agreeableness seek to forgive, compromise, and cooperate. Low “A” individuals are the opposite— they hold grudges, are critical of others, get angry about their mistreatment, and are stubborn and willing to argue for their point of view ([Lee and Ashton 2004](#)). They are more volatile and impolite. In democratic contexts, such individuals appear more willing to vote for populist, anti-establishment parties ([Bakker, Rooduijn and Schumacher 2016](#)). In authoritarian contexts, it is precisely these sorts of individuals that should be enraged over repression, corruption and other abuses of power ([Greene and Robertson 2017](#)). This is

¹[Hasmath, Teets and Lewis \(2019\)](#) provide the most closely related analysis in the Chinese case, though their study focuses on policy innovation among local officials and uses its own personality scale.

the key finding of [Greene and Robertson \(2017\)](#)'s study on the Russian case, which is in direct conversation with this paper.²

Third, we may expect Conscientiousness to lead citizens to support the political system. High "C" individuals are generally more cautious and organized— they tend to follow rules and conform to social expectations. In the U.S., Conscientiousness has shown to be associated with conservative political thought ([Carney et al. 2008](#); [Gerber et al. 2010](#); [Mondak et al. 2010](#)). The literature would suggest this trait to be negatively associated with discontent in authoritarian systems ([Greene and Robertson 2017](#)). Discontented citizens may be especially lacking in the facet of prudence, which would render them more willing to take risks and reject the boundaries of standard political discourse.

I test these ideas with three original surveys of Chinese citizens: an online survey of 2024 citizens (Study 1: China Personality Test), a national face-to-face survey of 3573 citizens that is representative of urban China (Study 2: China Urban Governance Survey), and a convenience sample survey of 1986 university students (Study 3: Beijing Student Survey). To my knowledge, this represents the largest scale effort to date to measure personality traits among Chinese citizens, and arguably the richest data collection in any single country to relate personality and political attitudes. This multi-survey design provides the opportunity to assess whether the findings are replicable within the Chinese case, using different populations and administration settings.

The average discontented citizen in contemporary China does not appear to be a charismatic, dynamic, open-minded cosmopolitan, but rather a fearful, disorganized, disagreeable introvert, one without close emotional attachments to others, nor a particularly strong intellectual curiosity. In the language of the HEXACO six factor model of personality ([Ashton and Lee 2009](#); [Lee and Ashton 2004](#)), regime discontents show consistently lower levels of Extraversion, Conscientiousness, Agreeableness, and to a lesser extent, Openness to Experience. On the Emotionality domain, they have higher levels of fearfulness and anxiety, and lower levels of dependence and sentimentality.

Combined, the results show the degree to which the Chinese Communist Party (CCP) dom-

²Readers should note that existing research relies primarily on the Five Factor Model and Ten Item Personality Inventory (TIPI) ([Gosling, Rentfrow and Swann Jr 2003](#)), while this paper employs the HEXACO six factor model and its associated question battery ([Ashton and Lee 2009](#); [Lee and Ashton 2004](#)). The personality domains in the two models do not map perfectly to each other, and the Agreeableness domain of the HEXACO model is more closely linked to volatility, and less so with compassion and politeness, which are dominant components of Agreeableness in the Five Factor Model ([Ludeke et al. 2019](#)). This has important implications for interpreting the results, which I will return to in the analysis section.

inates Chinese society, relegating discontent to the margins. We see this at the personality level in China—citizens that express dissatisfaction with the regime have traits typically associated with social isolation: low social esteem, a lack of intellectual curiosity, combative interpersonal exchanges, few emotional attachments to others, and high levels of neuroticism and anxiety (Anderson et al. 2001; Jensen-Campbell et al. 2002; Ozer and Benet-Martinez 2006). Conversely, CCP members and other loyalists display socially dominant traits: high levels of confidence and extraversion, organization and work ethic, interpersonal skill, and even creativity and dynamism. This pattern may be another source of the CCP’s “authoritarian resilience” (Nathan 2003).

This study adds to growing literatures on the foundations of regime support and the psychology of authoritarian rule (Blaydes 2010; Geddes and Zaller 1989; Kim and Gandhi 2010; Magaloni 2006; Reuter and Szakonyi 2015; Treisman 2011). Personality and other psychological traits are central to understanding political attitudes and behavior in authoritarian systems (Aytaç, Schiumerini and Stokes 2018; Greene and Robertson 2017; Hasmath, Teets and Lewis 2019; Lewis, Teets and Hasmath 2018; Nugent 2020; Young 2019, 2020). The fact that introversion, and not intellectual curiosity or openness, is the key driver of discontent in China should also change how we think about the cognitive pathways to rejecting these regimes. Exposure to anti-regime information does appear to shift political attitudes in places like China (Chen and Yang 2019), but the current study suggests that social relationships and embeddedness might also play a significant role.

The paper also contributes to our understanding of political selection under authoritarianism. Political parties are thought to enhance regime stability, as they allow rulers to coopt certain groups within the population, share power, and distribute rents (Gandhi and Przeworski 2006; Gandhi 2008; Magaloni and Kricheli 2010; Reuter and Robertson 2014; Smith 2005). But our understanding of membership in these institutions is still thin, and the few studies we do have are focused primarily on regime elites or government officials (Hasmath, Teets and Lewis 2019; Hassan 2017; Liu 2019; Manion 2017; Shih, Adolph and Liu 2012). The findings presented here on the personalities of CCP members tell us something about what types of citizens authoritarian regimes seek to bring into the rank-and-file (Dickson and Rublee 2000). We learn that the CCP has been successful in co-opting citizens with particularly dynamic personalities—“go-getter” types that find personal and professional success. This provides a stock of talent from which to draw for government and party positions (Hasmath, Teets and Lewis 2019), and a stock of social influence that allows the regime to transmit its narrative.

Background: China's Political Context

The Chinese Communist Party (CCP) is one of the most durable authoritarian regimes in modern history (Levitsky and Way 2013). Much of this resilience appears to stem from the fact that the regime is well-institutionalized and has a rich set of power-sharing institutions to manage elite conflict— term limits, well-defined collective decision-making mechanisms, and norms for power transitions (Nathan 2003; Svoblik 2012). These institutions are actively being eroded by Xi Jinping (Fewsmith and Nathan 2019), but for now the CCP has managed to largely avoid public elite splits that could potentially spill out into the streets.

The contemporary CCP fits into several standard categories in the study of authoritarianism. It is a single party system with no political opposition and no meaningful national level elections (Geddes 1999; Magaloni and Kricheli 2010). This is a closed system, in contrast to more competitive systems where the dictator allows a loyal opposition and must actually run for office and win (Morse 2012; Snyder 2006; Schedler 2009).

From a strategy perspective, the CCP stands apart in its sophistication, on both the coercive and responsive sides of authoritarian rule. The current regime has learned the lessons of its own history, and it has constructed a repressive apparatus designed to prevent widespread collective action (Wang 2014). This manifests itself in the way social media is censored (King, Pan and Roberts 2013, 2014, 2017; Roberts 2018), how the press is controlled (Repnikova 2017; Stockmann 2013), and how protests and dissidents are managed (Cai 2008; Carter and Carter 2020, Tanner 2004; Truex 2019). The system allows for the appearance of citizen contention, provided that it does not escalate to the point where it actually threatens the regime.

A growing research agenda in Chinese politics draws attention to the responsive and consultative sides of the CCP (Teets 2013). In the last two decades, the Party has augmented the government's input institutions, providing institutionalized mechanisms for citizens to voice their policy ideas and grievances. These include "Mayor's Mailboxes" and other online comment portals (Chen, Pan and Xu 2016; Distelhorst and Hou 2017), in addition to more traditional channels like the petition system (Li 2013). China's parliament— the People's Congress system— also appears to foster a degree of representation (Manion 2015; O'Brien 1994; Truex 2016).

The net result is that Chinese citizens appear to have very high levels of trust in the regime. This is one of the most well-documented findings in the study of Chinese politics (Chen and Dickson 2008; Chen, Zhong and Hillard 1997; Dickson 2016; Li 2004; Tang 2005, 2016). Citizens voice high levels of satisfaction with regime institutions and the central government, and dissatisfaction is usually directed at local governments, which have corrupted the intentions of

the more virtuous central leadership (Li 2004). Support for the government appears highest among CCP members, employees of the government or state-owned enterprises, and older citizens (Chen, Zhong and Hillard 1997; Dickson 2016; Tang 2016). We do not know how political attitudes and behavior are related to personality in China, which is one of the contributions of this study.

In researching the psychology of authoritarian rule under the Chinese Communist Party, it is important to emphasize that we are studying one of the “market leaders” in indoctrination, propaganda, censorship, and manipulation of the information environment. Most other regimes do not possess this level of capacity, longevity, sophistication, and societal dominance. The Discussion section considers whether and how the findings might travel to other authoritarian countries.

Research Design

Measures

A rich literature in psychology identifies the presence of core *personality traits* that are stable across individuals and different cultural contexts (Ashton and Lee 2009; Costa Jr and McCrae 1976; Goldberg 1982). Though the structure of personality is not universal, there is some evidence that the same general dimensions emerge consistently across industrialized societies, including China (McCrae and Terracciano 2005). Chinese psychologists now regularly use the measures employed in this paper and think in terms of the five and six factor models of personality (Volk et al. 2018; Wu, Yuan and Kou 2020; Yang et al. 1999; Zhang, Ziegler and Paulhus 2020; Zheng et al. 2017).

The standard measurement approach is to ask respondents to rate their agreement with a series of statements about themselves. This project employs the HEXACO six factor model of personality (Ashton and Lee 2009; Lee and Ashton 2004). These attributes are measured by the 60 item version of Lee and Ashton (2004)’s HEXACO PI-R. This instrument is longer and richer than the standard personality test employed in the political psychology literature (the Ten-Item Personality Inventory) (Gosling, Rentfrow and Swann Jr 2003), and the HEXACO model has also been subjected to rigorous cross-cultural testing and refinement (Ashton and Lee 2009; Lee and Ashton 2004). The lengthier survey instrument has the virtue of allowing me to measure the facets of these six personality domains, which will prove important to understanding the determinants of discontent. Table 1 summarizes the dimensions of personality and theoretical

expectations from existing literature.

Table 1: Personality Domains and Theoretical Expectations (HEXACO Model)

Dimension	Descriptors		Hypotheses (for Discontents)
	High	Low	
H. Honesty-Humility	sincere, honest, faithful, loyal, modest/unassuming	sly, deceitful, greedy, pretentious, hypocritical, boastful, pompous	
E. Emotionality	emotional, oversensitive, sentimental, fearful, anxious	brave, tough, independent, self-assured, stable	
X. Extraversion	outgoing, lively, extraverted, sociable, talkative, cheerful, active	shy, passive, withdrawn, introverted, quiet, reserved	
A. Agreeableness	patient, tolerant, peaceful, mild, agreeable, lenient, gentle	ill-tempered, quarrelsome, stubborn, choleric	Low
C. Conscientiousness	organized, disciplined, diligent, careful, thorough, precise	sloppy, negligent, reckless, lazy, irresponsible, absent-minded	Low
O. Openness to Experience	intellectual, creative, unconventional, innovative, ironic	shallow, unimaginative, conventional	High

Because the HEXACO framework is less dominant in the field, the core results are replicated in two of the surveys using the standard Five Factor Model and Ten-Item Personality Inventory (Gosling, Rentfrow and Swann Jr 2003). It is important to emphasize that the five and six factor models conceptualize and measure personality in very different ways. There is relative congruence across the models for the domains of Extraversion, Conscientiousness, and Openness to Experience. The HEXACO model adds a new personality domain– Honesty-Humility (H-H)– which is meant to capture the degree to which a person is sincere in their interactions and modest in their self-presentation. In the Five Factor Model, these attributes are partially captured in the Agreeableness domain, which has greater emphasis on compassion and politeness. The HEXACO conceptualization of Agreeableness taps more into volatility, temper, and anger. This trait is captured in the Emotional Stability domain of the Five Factor Model (Ludeke et al.

2019).

Thus, straightforward comparisons between HEXACO and Five Factor Model results can be problematic, though less so for the domains of Extraversion, Conscientiousness, and Openness to Experience. In this paper I will focus the analysis and discussion on the HEXACO results, bringing in notable findings from the Five Factor Model data where appropriate.

The concept of *political discontent* is measured with a frequently used question in public opinion research on China. It is too sensitive to ask Chinese citizens their approval of specific leaders or even the CCP as a whole, but it is possible to have respondents rate their level of satisfaction with the central government. All three surveys included the standard 0-10 scale format of this question; the mean satisfaction rating was 7.911 in the China Personality Test (CPT), 8.217 in the China Urban Governance Survey (CUGS), and 7.663 in the Beijing Student Survey (BSS). This accords with previous surveys in the field, which have found that Chinese citizens voice high levels of support for the central government (Dickson 2016; Li 2004). In the CPT, only 1.4% of respondents gave the government a rating of zero, and 5.2% gave a rating four or below—meaning that they actually expressed dissatisfaction. This broader group was coded as “discontent” with an indicator variable. Other citizens will be referred to as “supporters.” Figure 1 shows the distribution of regime support across the three surveys from mainland China. Because the choice of cutoff is somewhat arbitrary, Figures SI2a-SI2f in the Online Appendix show the robustness of the findings to alternative coding schemes.

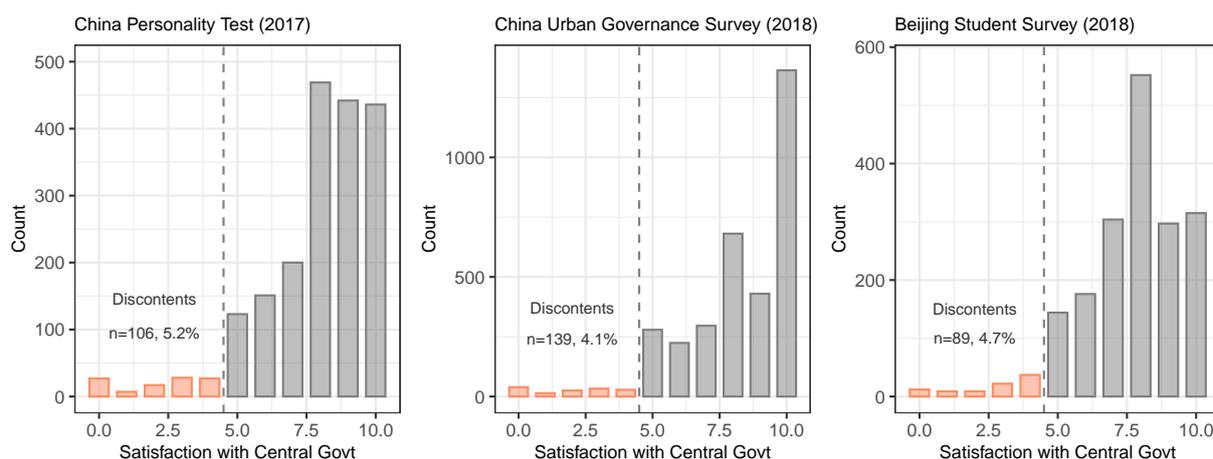


Figure 1: Distribution of regime support among Chinese citizens. Figure shows histograms of “satisfaction with the central government” across the three surveys. “Discontents” are those that express a 4 or less on the 0 to 10 point scale of satisfaction with the central government; “Supporters” express a 5 or higher. All data drawn from the China Personality Test (CPT), the China Urban Governance Survey (CUGS), and the Beijing Student Survey (BSS).

Note that this operationalization of discontent implies an attitudinal definition— citizens are discontent based on their professed attitudes towards their government. I am not identifying discontents based on what they do— their levels of political participation, or protest, for example. These are conceptually distinct categories and will be analyzed as such. In the China field, it is well documented that participants in contentious collective action (protest, petitions, etc.) are not necessarily anti-regime, and often conceptualize their actions as in line with the goals of the central government (O'Brien 1996; Tsai 2015). Chinese citizens in general hold relatively positive views of the central government and blame their problems on the local government, which is viewed as corrupt and untrustworthy (Li 2004).

Participants

Data for the study comes from three original surveys of Chinese citizens, one administered online (China Personality Test - 2017), a second administered in person to a nationality representative sample of citizens in urban China (China Urban Governance Survey - 2018), and a third administered in person to a convenience sample of students at universities in Beijing (Beijing Student Survey - 2018). With respect to statistical power, my approach was to maximize sample size subject to budget constraints, and to ensure I had three relatively large samples to assess the empirical relationships. The surveys contain some overlapping and some distinct sets of questions, which allow me to probe different aspects of the relationship between personality and discontent. Figure 2 provides an overview of the three survey instruments.³

³The Supporting Information includes full English and Chinese language question wordings for all major question batteries, as well as summary information on the samples.

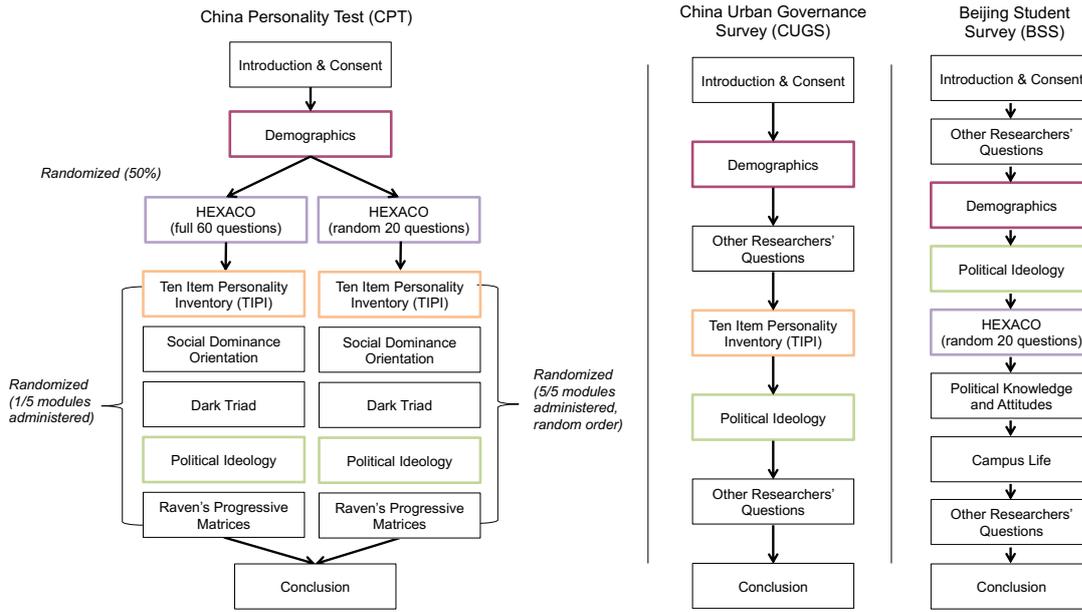


Figure 2: Overview of surveys. Figure shows design of three survey instruments used for the study. The color codings indicate common question batteries used across the different surveys.

1. *China Personality Test (CPT)*. 2024 Chinese citizens completed the China Personality Test in April 2017 after receiving an email solicitation from a local marketing research firm. This is the richest survey of the three in terms of the number of personality questions and concepts measured. In addition to the HEXACO-PI-R (Ashton and Lee 2009; Lee and Ashton 2004), the survey instrument included measures of Social Dominance Orientation (SDO-7) (Ho et al. 2015), the “Dark Triad” personality characteristics (SD3) (Jones and Paulhus 2014), political ideology (Meng-Wu Ideology Battery), and intelligence (Raven’s Progressive Matrices). Respondents were randomly assigned to view some question batteries and not others to keep the online survey to a manageable length. See Figure 2 for a visualization of the randomization process. This yielded roughly 1200 (out of 2000) responses for each question.⁴
2. *China Urban Governance Survey (CUGS)*. The second survey is the China Urban Governance Survey (CUGS), a biannual nationally-representative urban survey implemented by the Research Center on Data and Governance (RCDG) at Tsinghua University. The survey employed GPS assisted sampling to reach a target population of Chinese urban residents aged 18 and above. A total of 6000 residential units were selected yielding an

⁴By design, the missingness in the data is Missing Completely at Random (MCAR), so analyses can be conducted with listwise deletion without inducing bias. Some specifications employ imputed data to bring all 2000 observations into the analysis.

effective sample size of 3573. The HEXACO 60 item personality test could not be included in the survey instrument because of space constraints, but respondents did complete the Ten Item Personality Inventory (TIPI) (Gosling, Rentfrow and Swann Jr 2003), which is the short, standard personality test employed by a number of studies in the political psychology literature. Note that the TIPI is meant to measure the “Big Five” personality traits and therefore does not map perfectly to the HEXACO six factor indicators. This dataset has a higher quality sample but lower quality personality measure.

3. *Beijing Student Survey (BSS)*. The third survey is the Beijing Student Survey (BSS), which was conducted from October 18, 2018 through January 1, 2019, also in partnership with the Research Center on Data and Governance at Tsinghua University. The survey was implemented among undergraduate and graduate students at 25 colleges and universities in Beijing, covering 80% of the city’s tertiary institutions. Table SI2 in the Supporting Information shows the full list of universities included in the project. Within each university, certain required classes were selected and times were arranged in class for students to take the survey using a tablet. About 94% of students surveyed produced a valid set of responses, yielding a sample size of 1986. Due to space constraints on the BSS questionnaire, respondents completed a randomly selected group of 20 questions from the full 60 question HEXACO-PI-R. Multiple imputation was then used to generate personality scores for all respondents.⁵ As with the CPT and CUGS, the BSS contained standard demographic questions, measures of political ideology (the Wu-Meng Ideology Battery), and the measure of satisfaction with the central government used to identify regime discontents.

The full English and Chinese language question wordings for all major question batteries are included in the Supporting Information. Figure 2 provides an overview of the three survey instruments, and Table 2 provides some summary information on the demographics.

Missingness

There are two types of missingness in the data. As shown in Figure 2, for both the online survey (CPT) and the student survey (BSS), not all respondents saw all questions in order to keep the questionnaire a manageable length. By design, this missingness in the data is Missing

⁵The imputation model included all 60 HEXACO personality questions, the measure of discontent, and basic demographic characteristics (*age, female, minority status, education*). The randomization was done such that all respondents had at least two questions for each domain of the personality scale.

Table 2: Sample Comparisons

	CPT (2017)		CUGS (2018)		BSS (2019)	
	Mean	SD	Mean	SD	Mean	SD
Demographic						
<i>female</i>	0.462	0.499	0.536	0.499	0.632	0.482
<i>age</i>	36.35	11.236	46.59	16.971	19.32	1.657
<i>res.urban</i>	0.700	0.458	0.469	0.499	.	.
<i>minority</i>	0.036	0.187	0.044	0.205	0.181	0.385
<i>edu.univ</i>	0.567	0.496	0.162	0.368	0.930	0.256
<i>edu.maphd</i>	0.086	0.280	0.024	0.1542	0.070	0.256
<i>ccp</i>	0.298	0.457	0.151	0.358	0.053	0.225
Personality						
<i>hex.honesty-humility</i>	3.519	0.475	.	.	2.665	0.705
<i>hex.emotionality</i>	3.159	0.385	.	.	3.307	0.488
<i>hex.extraversion</i>	3.428	0.536	.	.	4.000	0.683
<i>hex.agreeableness</i>	3.387	0.441	.	.	3.33	0.439
<i>hex.conscientiousness</i>	3.441	0.450	.	.	3.315	0.436
<i>hex.openness</i>	3.372	0.505	.	.	3.463	0.448
<i>socialdominance</i>	2.508	0.546
<i>ravens</i>	2.509	1.934
Attitudes						
<i>sat.central</i>	7.911	2.025	8.217	2.081	7.663	1.836
<i>sat.local</i>	6.543	2.372	7.399	2.388	6.781	2.124
<i>ideology.freemarket</i>	2.877	0.474	2.387	0.340	3.019	0.425
<i>ideology.democracy</i>	2.654	0.570	2.143	0.461	2.670	0.571
<i>discontent</i>	0.106	0.308	0.041	0.198	0.047	0.213
HEXACO PI-R	Yes		No		Yes	
TIPI	Yes		Yes		No	
SDO	Yes		No		No	
Political Ideology	Yes		Yes		Yes	
Year	2017		2018		2018	
Observations	2024		3573		1986	

Note: Table compares means for demographic, professional, personality, and attitudinal variables across the CPT, CUGS and BSS samples.

Completely at Random (MCAR). As is best practice, respondents were also given the option to say “Don’t know/No answer” to all questions. This type of nonresponse can be problematic in China surveys, particularly those focused on rural areas where respondents feel their anonymity might be comprised (Ratigan and Rabin 2020; Shen and Truex 2020). In our surveys, this type of nonresponse was actually not terribly severe. For the question on satisfaction with the central

government, the nonresponse rates were 4.7%, 3.6%, and 5.5% for the online survey (CPT), urban face to face survey (CUGS), and student survey (BSS), respectively. This is relatively low for the Chinese context and in line with what scholars observe for comparable questions on the World Values Survey in other countries (Shen and Truex 2020).⁶

Results

Personality and Regime Support

The core analysis is presented in Figures 3 and 4, which show the difference of means ($\beta_{disc} = \bar{X}_{disc} - \bar{X}_{supp}$) in the six HEXACO dimensions of personality between regime “discontents” and citizens that express satisfaction with the regime (“supporters”).⁷ Figure 3 also provides the difference of means for some of the other scales included in the survey: Social Dominance Orientation (Anti-egalitarianism, Dominance), intellect (Raven’s progressive matrices), and ideology (pro-democracy, pro-market). All measures are on a five-point scale. The solid line and triangle show the data from the online national survey (CPT), the dotted line and circle show data from the face-to-face student survey (BSS), and the dashed line and square show the nationally representative urban survey (CUGS). Figure SI1 in the Supporting Information shows the equivalent analysis using the TIPI personality measure. In line with emerging best practices, I report the estimates and 95% confidence intervals, rather than engaging in null hypothesis significance testing (NHST). Throughout the paper, I color code the HEXACO dimensions in all figures to ease interpretation: Honesty-Humility (dark green), Emotionality (orange), Extraversion (purple), Agreeableness (pink), Conscientiousness (light green), and Openness to Experience (yellow).

The data shows that regime supporters and discontents have different levels of certain personality traits. On average, discontents appear to have lower levels of Conscientiousness (CPT: $\hat{\beta}_{disc} = -0.11$, 95% CI = [-0.21, -0.02]; BSS: $\hat{\beta}_{disc} = -0.22$, 95% CI = [-0.30, -0.13]), Honesty-Humility (CPT: $\hat{\beta}_{disc} = -0.13$, 95% CI = [-0.24, -0.03]; BSS: $\hat{\beta}_{disc} = -0.27$, 95% CI = [-0.41, -0.13]), Agreeableness (CPT: $\hat{\beta}_{disc} = -0.18$, 95% CI = [-0.29, -0.08]; BSS: $\hat{\beta}_{disc} = -0.24$, 95% CI = [-0.33, -0.16]), and Extraversion (CPT: $\hat{\beta}_{disc} = -0.28$, 95% CI = [-0.41, -0.14]; BSS: $\hat{\beta}_{disc} = -0.39$, 95% CI = [-0.59, -0.19]). We also see that discontents are much more likely to express

⁶I address missingness primarily through multiple imputation (Honaker et al. 2011). In addition to all the attitudinal questions used, our imputation model includes standard covariates known to predict missingness in the Chinese case (gender, education, ethnicity, party membership, etc.). In the Supporting Information, Figures SI2a-f show that the results and substantive argument are not sensitive to using listwise deletion versus imputation.

⁷The estimates were recovered using bivariate regressions with an intercept, which more easily allows for the incorporation of imputed data.

pro-democracy (CPT: $\hat{\beta}_{disc} = 0.58$, 95% CI = [0.46, 0.69]; CUGS: $\hat{\beta}_{disc} = 0.26$, 95% CI = [0.16, 0.36]; BSS: $\hat{\beta}_{disc} = 0.47$, 95% CI = [0.36, 0.58]) and pro-market ideology (CPT: $\hat{\beta}_{disc} = 0.22$, 95% CI = [0.13, 0.32]; CUGS: $\hat{\beta}_{disc} = 0.13$, 95% CI = [0.06, 0.21]; BSS: $\hat{\beta}_{disc} = 0.15$, 95% CI = [0.07, 0.23]). There do not appear to be differences in intellect across the two groups based on the short IQ test included in the CPT survey ($\hat{\beta}_{disc} = -0.10$, 95% CI = [-0.55, 0.34]).

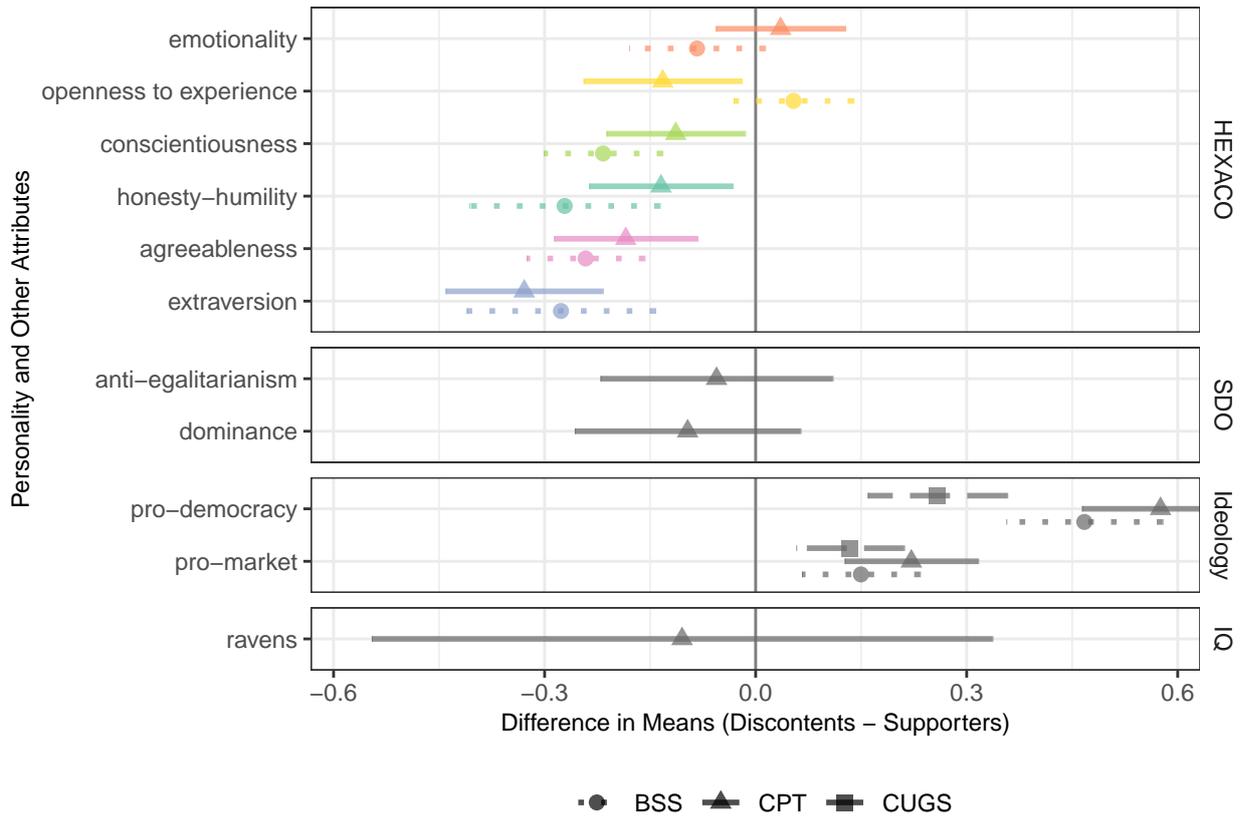


Figure 3: Personality and regime support among Chinese citizens. Figure shows the difference in mean personality scores for the six HEXACO-PI-R domains of personality across regime “discontents” and “supporters” in contemporary China. “Discontents” are those that express a 4 or less on the 0 to 10 point scale of satisfaction with the central government; “supporters” express a 5 or higher. Segments represent 95% confidence intervals. All data drawn from the China Personality Test (CPT), China Urban Governance Survey (CUGS), and Beijing Student Survey (BSS).

Figure 4 provides a deeper look into the twenty-four HEXACO facets of personality. The plot is sorted such that traits towards the top are more common in discontents relative to supporters, and traits towards the bottom are less common. The left panel shows the CPT data (online survey), and the right panel shows the BSS data (student survey).

The most striking relationship in the figure is the difference in levels of Extraversion. Chinese citizens that express dissatisfaction with the central government have lower levels of personal worthiness and see themselves as unpopular (social self-esteem) (CPT: $\hat{\beta}_{disc} = -0.36$, 95% CI

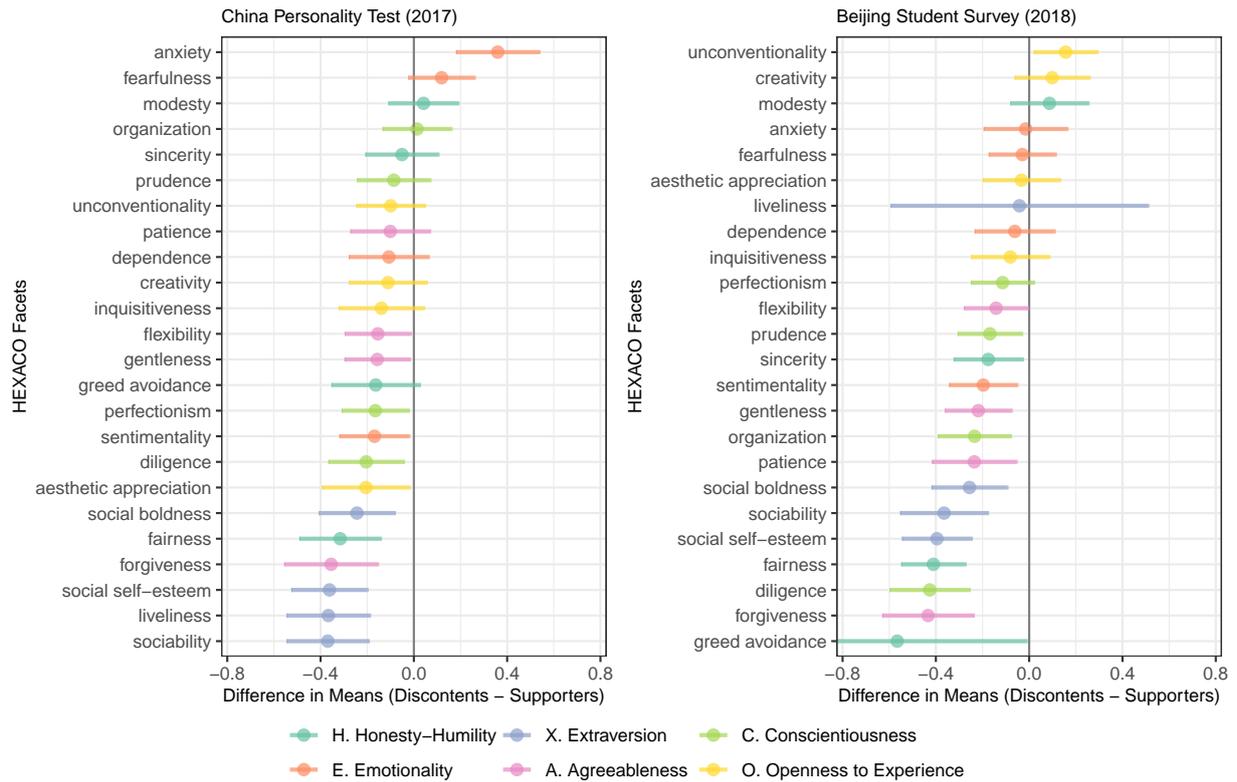


Figure 4: Difference in facets of personality for supporters and discontents. Figure shows the difference in mean personality scores for the HEXACO-PI-R facets of personality across regime “discontents” and “supporters” in contemporary China. “Discontents” are those that express a 4 or less on the 0 to 10 point scale of satisfaction with the central government; “Supporters” express a 5 or higher. Segments represent 95% confidence intervals. The left panel shows data drawn from the China Personality Test (CPT), and the right panel shows data from the Beijing Student Survey (BSS)

$= [-0.53, -0.20]$; BSS: $\hat{\beta}_{disc} = -0.40$, 95% CI = $[-0.55, -0.25]$). They appear to be more shy and do not enjoy socializing with others (sociability) (CPT: $\hat{\beta}_{disc} = -0.37$, 95% CI = $[-0.55, -0.19]$; BSS: $\hat{\beta}_{disc} = -0.36$, 95% CI = $[-0.55, -0.18]$). They also self-report as being less cheerful and enthusiastic about life (liveliness) (CPT: $\hat{\beta}_{disc} = -0.37$, 95% CI = $[-0.55, -0.19]$; BSS: $\hat{\beta}_{disc} = -0.04$, 95% CI = $[-0.60, 0.51]$). This has important implications for political participation (Gerber et al. 2012; Mondak et al. 2010), which I return to shortly.

Table 3 provides further insight into these finding. It shows the ten personality questions with the largest difference between regime supporters and discontents using the CPT data. Half of these questions measure Extraversion. Here we see how discontents suffer from low levels of self-esteem and confidence. They do not feel “cheerful and optimistic” (question H22), they are not “reasonably satisfied” with themselves (question H4), and they sometimes feel like a “worthless person” (H52). They also seem to prefer working and being alone (H16 and H40).

On the Agreeableness dimension, discontended citizens are more likely to be critical in their

Table 3: Questions that Differentiate CCP Supporters and Discontents

Question	Domain (facet)	$\hat{\beta}_{disc}$ ($\bar{X}_{disc} - \bar{X}_{supp}$)
H22. On most days, I feel cheerful and optimistic.	Extraversion (liveliness)	-0.78 [-1.00, -0.55]
H4. I feel reasonably satisfied with myself overall.	Extraversion (social self-esteem)	-0.52 [-0.73, -0.30]
H36. I would never accept a bribe, even if it were very large.	Honesty-Humility (fairness)	-0.47 [-0.70, -0.23]
H16. I prefer jobs that involve active social interaction to those that involve working alone.	Extraversion (sociability)	-0.45 [-0.68, -0.22]
H35R. I worry a lot less than most people do.	Emotionality (anxiety)	-0.43 [-0.66, -0.20]
H52R. I sometimes feel that I am a worthless person.	Extraversion (social self-esteem)	0.38 [0.12, 0.64]
H3. I rarely hold a grudge, even against people who have badly wronged me.	Agreeableness (forgiveness)	-0.38 [-0.62, -0.13]
H34. In social situations, I'm usually the one who makes the first move.	Extraversion (social boldness)	-0.34 [-0.57, -0.10]
H27. My attitude toward people who have treated me badly is "forgive and forget".	Agreeableness (forgiveness)	-0.33 [-0.58, -0.086]

Note: Table shows the difference in means for different personality questions from the HEXACO-PI-R across regime "discontents" and "supporters" in contemporary China. Positive numbers in the rightmost column correspond to questions where discontents are more likely to agree than supporters. 95% CIs shown in brackets. Table shows data from China Personality Test (CPT).

assessments of others (gentleness) (CPT: $\hat{\beta}_{disc} = -0.16$, 95% CI = [-0.30, -0.02]; BSS: $\hat{\beta}_{disc} = -0.30$, 95% CI = [-0.53, -0.08]) and less likely to compromise (flexibility) (CPT: $\hat{\beta}_{disc} = -0.15$, 95% CI = [-0.30, -0.01]; BSS: $\hat{\beta}_{disc} = -0.17$, 95% CI = [-0.42, 0.07]). Their defining feature is that they are unwilling to forgive those that have caused them harm (forgiveness) (CPT: $\hat{\beta}_{disc} = -0.35$, 95% CI = [-0.56, -0.15]; BSS: $\hat{\beta}_{disc} = -0.30$, 95% CI = [-0.58, -0.02]). They tend to judge other people (H33) and hold a grudge (H3). This is consistent with [Greene and Robertson \(2017\)](#)'s recent findings on the Russian case, giving evidence of the generalizability of the “agreeableness breeds acquiescence” argument. In societies where accepting the regime is the norm, those that express discontent with the political system appear to have a certain combativeness to their personality.

Differences in the other aspects of personality are less dramatic. Citizens satisfied with the regime do score higher than discontents on the Conscientiousness “C” domain, again in line with findings in Putin’s Russia ([Greene and Robertson 2017](#)). Discontented citizens tend to show less concern for details (perfectionism) (CPT: $\hat{\beta}_{disc} = -0.17$, 95% CI = [-0.31, -0.02]; BSS: $\hat{\beta}_{disc} = -0.11$, 95% CI = [-0.25, 0.021]), caution (prudence) (CPT: $\hat{\beta}_{disc} = -0.09$, 95% CI = [-0.24, 0.07]; BSS: $\hat{\beta}_{disc} = -0.17$, 95% CI = [-0.31, -0.03]), and willingness to exert effort (diligence) (CPT: $\hat{\beta}_{disc} = -0.20$, 95% CI = [-0.37, -0.04]; BSS: $\hat{\beta}_{disc} = -0.43$, 95% CI = [-0.60, -0.25]). This is consistent with the finding that Conscientiousness is associated with conservatism and conformity in democracies ([Gerber et al. 2010](#); [Mondak et al. 2010](#)). Conscientious people are more likely to adhere to norms and rules, and this trait also appears to breed acquiescence under authoritarianism.

It is noteworthy that Openness to Experience does not appear to be positively associated with political discontent (CPT: $\hat{\beta}_{disc} = -0.13$, 95% CI = [-0.24, -0.02]; BSS: $\hat{\beta}_{disc} = 0.05$, 95% CI = [-0.03, 0.14]) or pro-democracy views. If anything, citizens that are dissatisfied with the CCP regime appear to have lower levels of inquisitiveness, creativity, aesthetic appreciation, though these differences are small and not robust across the three surveys.

Finally, there is some evidence that discontents are lower on Honesty-Humility, the so-called “H-factor” of personality unique to the six factor model ([Ashton and Lee 2009](#); [Lee and Ashton 2004](#)). Discontents are particularly low on the dimension of fairness, which measures things like willingness to accept a bribe, steal, or use counterfeit money. This may reflect a Machiavellian worldview, a willingness to do whatever it takes to get by, and a broader cynicism with Chinese society. Discontents are comparable to other Chinese citizens in their levels of modesty and sincerity in their interactions.

In the Supporting Information, Figures SI2a-f show the robustness of the findings across different strategies for handling missing data, measuring discontent, and measuring personality. The core substantive findings are also robust across these different analytical approaches. Again, we need to be careful in how we compare HEXACO and Five Factor Model representations of the personality domains (especially on the Agreeableness domain), but in general we also observe lower levels of Extroversion, Openness to Experience, and Agreeableness among discontents when we use the Ten Item Personality Inventory. Emotional Stability also seems lower among discontents in the TIPI data, which perhaps reflects the findings on fearfulness and anxiety we observed with the HEXACO data. Conscientiousness does not emerge as a significant predictor when measured using the TIPI (Gosling, Rentfrow and Swann Jr 2003).

Personality and Political Participation

We can summarize average personality attributes across different groups of citizens using radar plots, shown in Figure 5. The figure shows the 24 different facets of personality on a single chart for a given citizen type, where each point represents the standardized mean difference between that citizen type and the full sample. A score of .25, for example, signifies that that citizen type has scores .25 standard deviations higher than the sample average on that facet. Figure 5 shows the mean personality scores for citizens that expressed dissatisfaction with the central government (“discontents”), citizens that reported participating in protests (“protestors”) and members of the Chinese Communist Party (“CCP members”). Note again that in the Chinese setting, protestors are not necessarily discontent with the regime, and discontents do not necessarily engage in contentious behavior (O’Brien 1996; Tsai 2015).

This chart requires some time on the part of the reader to fully synthesize, but visually a few patterns emerge. The first is the relationship between personality and political participation. The personalities of protestors are quite different from citizens that expressed the greatest levels of discontent in a survey setting. As discussed above, discontents on average are anxious, emotionally detached introverts. Protestors have above average levels of Extraversion, and they have lower levels of anxiety. These findings are consistent with those from the U.S. case (Gerber, Huber, Doherty, Dowling, Raso and Ha 2011; Gerber et al. 2012; Mondak et al. 2010), where introversion and anxiety have been shown to be negatively associated with participation. In Zimbabwe, Young has found that the emotion of fear reduces the impulse to engage in dissent, and self-efficacy (which is related to extraversion) is associated with participants’ willingness to take political action in favor of the opposition (Young 2019, 2020). Precisely the personality

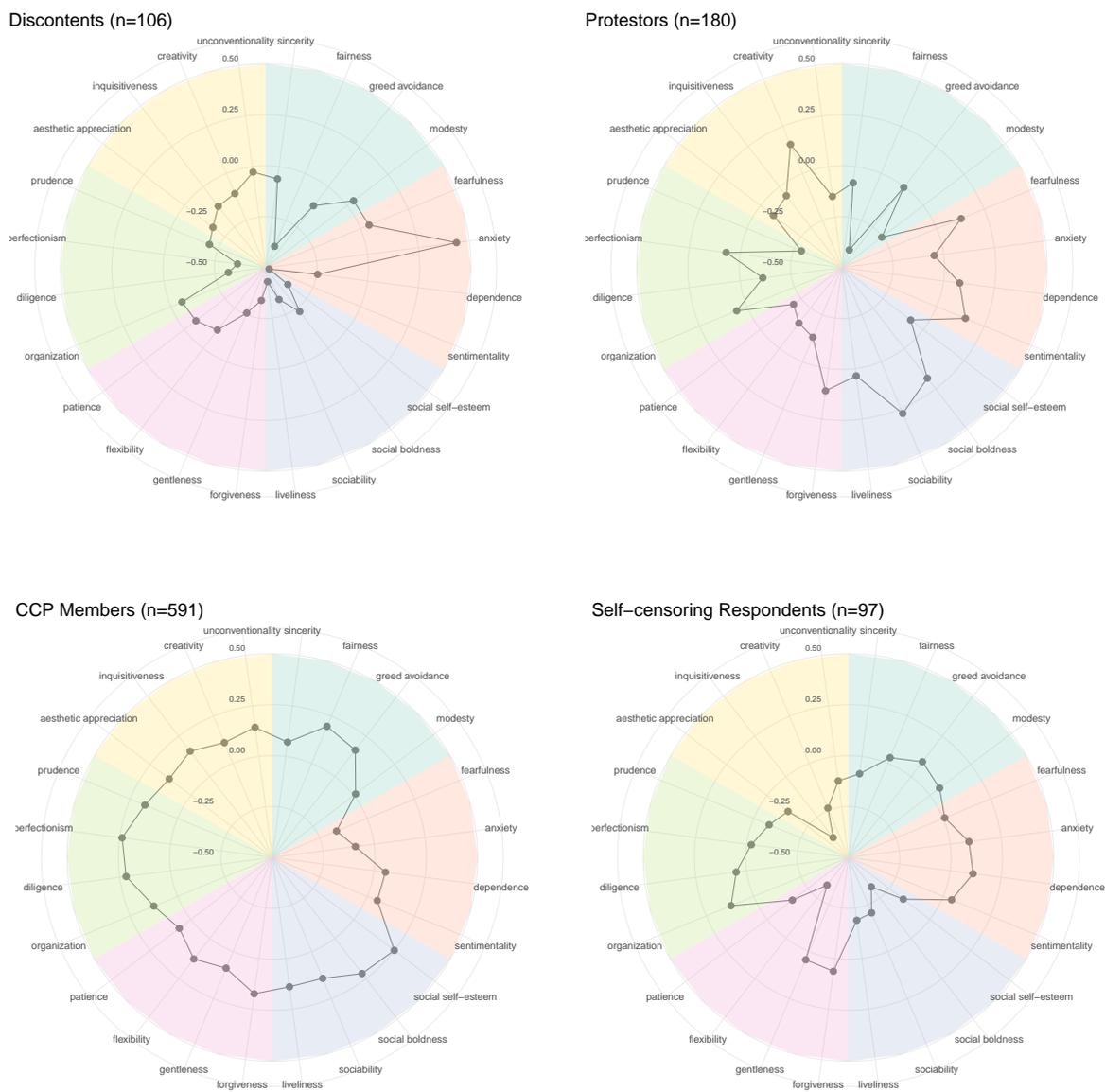


Figure 5: Personality attributes across citizen types. Figure shows mean personality scores across the six HEXACO-PI-R domains of personality and their facets for different groups of citizens. All data points reflect standardized mean differences between the citizen group and the full sample. All data drawn from the China Personality Test (CPT).

traits associated with discontent in Chinese society are those that curb collective action and contentious participation.

Figure 5 also allows for a read on the personality of the CCP. Party members look quite different than discontents and other Chinese citizens in the sample. CCP members on average have very high levels of Extraversion, Agreeableness, and Conscientiousness. The average party member is confident, outgoing, and highly sociable. They tend to agree with others, forgive wrongdoing, and show patience in their interactions. They are well-organized, hardworking, and relatively risk-averse. These are traits known to be associated with social conformity and pro-establishment behavior (Bakker, Rooduijn and Schumacher 2016; Di Palma and McClosky 1970). Ideologically, party members are more likely to affirm the political system.

Considering Self-censorship

In authoritarian settings, we should be careful in how we use direct regime assessment questions. Citizens might inflate their ratings of the government because they are scared to reveal their true feelings. When a Chinese citizen says her satisfaction with the government is “9,” we have no way of knowing if it really is 9, or if it is 6 but she says “9” out of fear. This phenomenon is known as “preference falsification” (Kuran 1991). Alternatively, they may remain reticent and refuse to answer the question completely. Such self-censorship appears to be relatively common in the Chinese case, especially among members of marginalized groups (Ratigan and Rabin 2020; Shen and Truex 2020).⁸

For this reason, the analysis above should be interpreted as a study of “known discontents”—the subset of people who appear to be unhappy with the regime and are willing to say so. But this leaves open the possibility of “quiet discontents”—people who might actually hate the regime but are reluctant to reveal those feelings, at least in a survey context. Do these citizens have similar personality traits?

It is difficult to measure falsification—feigning support—but we can readily measure self-censorship—refusing to say anything at all. Following Shen and Truex (2020) and Ratigan and Rabin (2020), we can look for clues based on patterns of item nonresponse in the survey. I identify respondents that said “Don’t Know/No Answer” to the question about satisfaction with the central government. Out of the 2024 respondents in the CPT data, 97 fit this criterion (about 5%).

⁸Emerging cross-national evidence suggests this behavior might not be all that widespread in the authoritarian world, but China is a notable exception (Shen and Truex 2020). Chinese citizens self-censor on sensitive survey questions at higher rates than normal.

Figure 5 also shows the personality profile for the self-censoring respondent, which proves quite similar to the profile for discontents. Citizens who refuse to rate the regime appear to be introverted and withdrawn, and they are also quite low on the Openness to Experience dimension. Compared to discontents, respondents that self-censor are slightly more forgiving (CPT: $\hat{\beta}_{selfcens} = 0.34$, 95% CI = [-0.01, 0.68]), sentimental (CPT: $\hat{\beta}_{selfcens} = 0.31$, 95% CI = [0.078, 0.54]) and emotionally dependent on others (CPT: $\hat{\beta}_{selfcens} = 0.24$, 95% CI = [-0.01, 0.50]). This may be the reason why they self-censor, and it suggests that subtle variations in personality type may be associated with differences in whether and how people choose to express their discontent.

Discussion

As with all studies in the personality and politics literature, the aim of this inquiry is descriptive—to assess whether certain personality traits are robustly related to attitudes and behavior. Three original surveys of Chinese citizens show that discontented citizens are different than regime supporters on a personality level. The discontents have lower levels of Agreeableness, Extraversion, and Conscientiousness. In general they lack social skills and confidence, are less organized and diligent in their tasks, and are more combative and unforgiving in their interactions. They also ascribe to a view of society as ruthless, competitive, and unforgiving.

Theoretical Interpretation

The unifying theme of the findings is that the discontents in China have personalities that are generally associated with social marginalization (Di Palma and McClosky 1970; Greene and Robertson 2017). They have traits that hinder their personal and professional success (Ozer and Benet-Martinez 2006). Less conscientious individuals have more difficulty finding and keeping jobs (Barrick and Mount 1991) and are more vulnerable to suicide (Verona, Patrick and Joiner 2001) and substance abuse (Walton and Roberts 2004). More introverted and disagreeable individuals have trouble making friends and developing long-term, healthy relationships (Anderson et al. 2001; Jensen-Campbell et al. 2002). Individuals with high anxiety and low emotional dependence on others are also prone to social isolation and depression (Diener et al. 1999).

Existing research on personality and life outcomes demonstrates that discontents' "isolating personality traits" would beget their social marginalization (causal path 2 in Figure 6), and

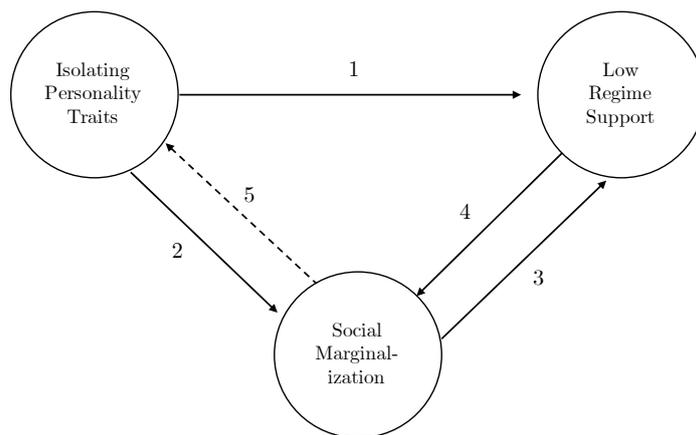


Figure 6: Possible theoretical relationships. Figure shows possible relationships between personality, social marginalization and regime support.

the data from this study shows that in general, these traits are associated with lower levels of regime support (causal path 1 in Figure 6). What remains to be studied is how precisely social marginalization itself affects regime support and the processes that underpin these associations.

Two candidate mechanisms merit further exploration. In the first, marginalization produces low regime support through resistance to indoctrination (causal path 3 in Figure 6). Discontented citizens have fewer social relationships, and they are more willing to be combative with their peers. Combined, these two personality features might make them less inclined to conform and adhere to social pressures (Di Palma and McClosky 1970).⁹ They receive fewer social cues to conform, and they are more willing to reject those cues. This dovetails with Geddes and Zaller (1989)’s arguments that citizens with low levels of political awareness are less susceptible to government propaganda.

In the second mechanism, the very act of voicing low levels of regime support leads individuals to become social pariahs (causal path 4 in Figure 6). In societies where most citizens engage in some form of public affirmation— either authentic support or preference falsification (Greene and Robertson 2017; Kuran 1991; Wedeen 2015)— publicly questioning the system can lead to the deterioration of social relationships. Prominent dissidents have described how their existence became “inconvenient” for certain family members (Havel 1993). In extreme cases, discontent citizens can become targets of repression, in turn cutting themselves off from friends and family to reduce the spread of relational repression (Deng and O’Brien 2013, O’Brien and Deng 2017).

Finally, it is possible that this marginalization in turn affects how personality traits manifest themselves (causal path 5 in Figure 6)— a once lighthearted, outgoing citizen might turn more

⁹Bakker, Rooduijn and Schumacher (2016) show that citizens that are low on the agreeableness dimension are more inclined to support anti-establishment parties and candidates.

introverted, anxious, and disagreeable after running up against a repressive authoritarian state. This last linkage might be controversial among some personality researchers; there is evidence that though a person's personality can change (Damian et al. 2019, Magidson et al. 2014; Stieger et al. 2020), it is relatively stable over the life course and trait shifts tend to be small in magnitude (Caspi et al. 2003; Roberts and Mroczek 2008; Schwaba and Bleidorn 2018). But this pathway is worth noting as a theoretical possibility, and a growing body of evidence in political psychology suggests that political preferences can have a causal effect on personality (Bakker, Lelkes and Malka 2021; Boston et al. 2018; Ludeke, Tagar and DeYoung 2016).

If these relationships operate as described, it would suggest a feedback loop of social marginalization and political discontent. Because of certain personality traits, some citizens in authoritarian systems are more likely to both a.) question the political system and b.) have difficulty developing and maintaining personal relationships. As they develop nonconformist political ideas, this further alienates them socially, which in turn makes them more resistant to social indoctrination. In aggregate, this dynamic would produce a set of citizens that reject regime ideology, but that are disconnected from mainstream society. Testing for this set of processes is beyond the scope of this paper, but it is feasible using life history analyses (Freedman et al. 1988) or other tools to tease out the evolution of citizens' personalities, social relationships, and political preferences.

Comparative Perspective

Combined with Greene and Robertson (2017)'s findings from Russia, this study contributes to our comparative understanding of the relationship between personality and regime support under authoritarian rule. Much seems to travel from Vladimir Putin's Russia to Xi Jinping's China, though important differences do emerge. As in Russia, the results in China show that both Agreeableness and Conscientiousness are strongly associated with regime support, across both the HEXACO and Five Factor Model conceptualizations of those traits. I observe lower levels of these traits among discontented citizens, and an abundance of these traits among CCP members. Similarly, I did not find that Openness to Experience drives more liberal or critical political attitudes in China, and Greene and Robertson (2017) note the absence of this association in Russia as well. This suggests key features of the broader relationship between personality and discontent might generalize across authoritarian systems. Table 4 summarizes the two sets of studies across different dimensions of interest.

Table 4: Study Comparison: Personality and Regime Support

	Greene & Robertson (2017)	Author Omitted (2021)
Country	Russia	China
Study Dates	2013	2017-2019
Sample	$N_{Study1} = 1200$, Online	$N_{Study1} = 2024$, Online $N_{Study2} = 3573$, F2F, Urban $N_{Study3} = 1986$, F2F, Students
Discontent/Support Measure	Putin vote, Putin approval, Despise leadership	Satisfaction with central govt.
Personality Measure	TIPI	HEXACO PI-R, TIPI
Findings: Correlates of Regime Support	Agreeableness, Conscientiousness	Extraversion, Agreeableness, Conscientiousness, Honesty-Humility

Note: Table compares results of current study with that of [Greene and Robertson \(2017\)](#). “F2F” indicates in-person data collection.

The key empirical difference we observe in the Chinese case is the negative association between discontent and Extraversion, which emerges as the strongest and most notable relationship in the data. [Greene and Robertson \(2017\)](#) find no significant association in Russia. How should we understand this difference, and does it matter for how we understand politics in the two countries?

Both studies point to social marginalization and conformity as being central to political life. As [Greene and Robertson \(2017\)](#) write (p. 1804):

Whereas democracy legitimizes the existence of different political positions, autocracy delegitimizes difference and disagreement, particularly in contexts where the regime is able to link support for the incumbents with patriotism. The delegitimization of dissent is reinforced by state media, political leaders, and officially approved social institutions. In such a context, to disagree is to invite conflict, leading opposition to be primarily the domain of people willing to accept social marginalization.

My interpretation of the China results is that the Chinese case reflects a more pronounced version of the dynamic [Greene and Robertson \(2017\)](#) describe. In the Russian case, citizens critical of Putin are generally more “critical, quarrelsome” and less “sympathetic, warm,” to use the direct language from the Ten Item Personality Inventory (TIPI) ([Gosling, Rentfrow and Swann Jr 2003](#)). But they are not less “extraverted, enthusiastic” or more “reserved,

quiet”, whereas they are in the Chinese case, in addition to being more disagreeable and fearful. The marginalization discontended citizens in China experience appears more acute– they report feelings of worthlessness and a lack of self-esteem.

This set of findings suggests that the “isolated discontent” pattern may be present in other authoritarian countries, but that the prominence and degree of this phenomenon might vary with the nature of the regime. Like Russia under Vladimir Putin, China under Xi Jinping is highly nationalistic and emphasizes Chinese identity and the collective pursuit of national greatness (Greene and Robertson 2017).

There are many differences between China under Xi Jinping and Russia under Vladimir Putin, but the most relevant for this study is the structure of opposition and political competition. China under the CCP is considered a “closed authoritarian” system– it does not allow opposition parties to exist, and there is not even a national election for the executive position (Snyder 2006). Russia is considered an “electoral authoritarian” system– it allows some degree of electoral competition and opposition, though the rules and practices are biased in favor of the regime. Other studies have suggested that this difference can drive variation in how citizens express their political attitudes (Shen and Truex 2020). Russian citizens can vote for and identify with credible opposition parties, while Chinese citizens cannot.

Authoritarianism is a spectrum (Greene and Robertson 2017), and there are regimes more oppressive than China under the CCP and regimes less oppressive than Russia under Putin. My expectation would be that the more closed and repressive the system, the more likely we will see the personality profile of discontents resemble what we observe in China. In more moderate and competitive authoritarian countries, anti-regime citizens might not be very isolated at all, and may not even show the low levels of Agreeableness observed in Russia (Greene and Robertson 2017). Testing this intuition will require systematic replication across additional authoritarian countries, and this study contributes to that effort.

Implications for Chinese Politics

The findings have broader implications for the study of authoritarian durability (Gandhi 2008; Svobik 2012). Recent scholarship on Chinese politics has sought to explain the resilience of the CCP, pointing to a number of different mechanisms that facilitate control of the population: rich input institutions and public participation channels (Nathan 2003); a sophisticated propaganda machine, complete with an army of internet trolls (King, Pan and Roberts 2017; Roberts 2018); and a highly developed repressive apparatus designed to preempt collective action (Wang and

Minzner 2015).

This paper suggests another reason why the CCP has managed to stay in power: social dominance. China's most critical citizens, by virtue of their personalities, are more likely to operate at the fringes of society. It may be more difficult for such citizens to spread their ideas and mobilize others, as they have traits that inhibit their social acceptance, and they are not inclined to participate in politics. The contemporary CCP is arguably the most sophisticated authoritarian regime in human history, and the net result of its censorship, propaganda, and indoctrination has been to make acquiescence the norm, and discontent the realm of social outsiders.

References

- Anderson, Cameron, Oliver P John, Dacher Keltner and Ann M Kring. 2001. "Who Attains Social Status? Effects of Personality and Physical Attractiveness in Social Groups." *Journal of Personality and Social Psychology* 81(1):116.
- Ashton, Michael C and Kibeom Lee. 2009. "The HEXACO-60: A Short Measure of the Major Dimensions of Personality." *Journal of Personality Assessment* 91(4):340-345.
- Aytaç, S Erdem, Luis Schiumerini and Susan Stokes. 2018. "Why do people join backlash protests? Lessons from Turkey." *Journal of Conflict Resolution* 62(6):1205-1228.
- Bakker, Bert N, Matthijs Rooduijn and Gijs Schumacher. 2016. "The psychological roots of populist voting: Evidence from the United States, the Netherlands and Germany." *European Journal of Political Research* 55(2):302-320.
- Bakker, Bert N, Yphtach Lelkes and Ariel Malka. 2021. "Rethinking the Link Between Self-Reported Personality Traits and Political Preferences."
- Barrick, Murray R and Michael K Mount. 1991. "The Big Five Personality Dimensions and Job Performance: a Meta-analysis." *Personnel Psychology* 44(1):1-26.
- Blaydes, Lisa. 2010. *Elections and Distributive Politics in Mubarak's Egypt*. Cambridge University Press.
- Boston, Joshua, Jonathan Homola, Betsy Sinclair, Michelle Torres and Patrick D Tucker. 2018. "The dynamic relationship between personality stability and political attitudes." *Public Opinion Quarterly* 82(S1):843-865.

-
- Bueno de Mesquita, Bruce, Alastair Smith, James D Morrow and Randolph M Siverson. 2005. *The Logic of Political Survival*. MIT press.
- Cai, Yongshun. 2008. "Local governments and the suppression of popular resistance in China." *The China Quarterly* 193:24–42.
- Cantoni, Davide, Yuyu Chen, David Y Yang, Noam Yuchtman and Y Jane Zhang. 2017. "Curriculum and Ideology." *Journal of Political Economy* 125(2):338–392.
- Carney, Dana R, John T Jost, Samuel D Gosling and Jeff Potter. 2008. "The Secret Lives of Liberals and Conservatives: Personality Profiles, Interaction Styles, and the Things They Leave Behind." *Political Psychology* 29(6):807–840.
- Carter, Erin Baggott and Brett L Carter. 2020. "Focal Moments and Popular Protests in Autocracies: Evidence from China." *Journal of Conflict Resolution* .
- Caspi, Avshalom, HonaLee Harrington, Barry Milne, James W Amell, Reremoana F Theodore and Terrie E Moffitt. 2003. "Children's Behavioral Styles at Age 3 are Linked to Their Adult Personality Traits at Age 26." *Journal of Personality* 71(4):495–514.
- Chen, Jidong, Jennifer Pan and Yiqing Xu. 2016. "Sources of authoritarian responsiveness: A field experiment in China." *American Journal of Political Science* 60(2):383–400.
- Chen, Jie and Bruce J Dickson. 2008. "Allies of the State: Democratic Support and Regime Support Among China's Private Entrepreneurs." *The China Quarterly* 196:780–804.
- Chen, Jie, Yang Zhong and Jan William Hillard. 1997. "The Level and Sources of Popular Support for China's Current Political Regime." *Communist and Post-Communist Studies* 30(1):45–64.
- Chen, Yuyu and David Y Yang. 2019. "The Impact of Media Censorship: 1984 or Brave New World?" *American Economic Review* 109(6):2294–2332.
- Costa Jr, Paul T and Robert R McCrae. 1976. "Age Differences in Personality Structure: A Cluster Analytic Approach." *Journal of Gerontology* 31(5):564–570.
- Damian, Rodica Ioana, Marion Spengler, Andreea Sutu and Brent W Roberts. 2019. "Sixteen going on sixty-six: A longitudinal study of personality stability and change across 50 years." *Journal of Personality and Social Psychology* 117(3):674.

-
- Deng, Yanhua and Kevin J O'Brien. 2013. "Relational Repression in China: Using Social Ties to Demobilize Protesters." *The China Quarterly* 215:533–552.
- Di Palma, Giuseppe and Herbert McClosky. 1970. "Personality and Conformity: The Learning of Political Attitudes." *American Political Science Review* 64(4):1054–1073.
- Dickson, Bruce. 2016. *The Dictator's Dilemma: the Chinese Communist Party's Strategy for Survival*. Oxford University Press.
- Dickson, Bruce J and Maria Rost Rublee. 2000. "Membership has its privileges: the socioeconomic characteristics of Communist Party members in urban China." *Comparative Political Studies* 33(1):87–112.
- Diener, Ed, Eunkook M Suh, Richard E Lucas and Heidi L Smith. 1999. "Subjective Well-being: Three Decades of Progress." *Psychological Bulletin* 125(2):276.
- Distelhorst, Greg and Yue Hou. 2017. "Constituency Service Under Nondemocratic Rule: Evidence from China." *Journal of Politics* 79(3):1024–1040.
- Fewsmith, Joseph and Andrew J Nathan. 2019. "Authoritarian resilience revisited: Joseph Fewsmith with response from Andrew J. Nathan." *Journal of Contemporary China* 28(116):167–179.
- Freedman, Deborah, Arland Thornton, Donald Camburn, Duane Alwin and Linda Young-DeMarco. 1988. "The Life History Calendar: A Technique for Collecting Retrospective Data." *Sociological Methodology* pp. 37–68.
- Frye, Timothy, Scott Gehlbach, Kyle L Marquardt and Ora John Reuter. 2017. "Is Putin's Popularity Real?" *Post-Soviet Affairs* 33(1):1–15.
- Gandhi, Jennifer. 2008. *Political Institutions Under Dictatorship*. Cambridge University Press New York.
- Gandhi, Jennifer and Adam Przeworski. 2006. "Cooperation, cooptation, and rebellion under dictatorships." *Economics & politics* 18(1):1–26.
- Geddes, Barbara. 1999. "What do we know about democratization after twenty years?" *Annual review of political science* 2(1):115–144.

-
- Geddes, Barbara and John Zaller. 1989. "Sources of Popular Support for Authoritarian Regimes." *American Journal of Political Science* pp. 319–347.
- Gerber, Alan S, Gregory A Huber, David Doherty and Conor M Dowling. 2011. "The Big Five Personality Traits in the Political Arena." *Annual Review of Political Science* 14:265–287.
- Gerber, Alan S, Gregory A Huber, David Doherty and Conor M Dowling. 2012. "Personality and the Strength and Direction of Partisan Identification." *Political Behavior* 34(4):653–688.
- Gerber, Alan S, Gregory A Huber, David Doherty, Conor M Dowling, Connor Raso and Shang E Ha. 2011. "Personality Traits and Participation in Political Processes." *Journal of Politics* 73(3):692–706.
- Gerber, Alan S, Gregory A Huber, David Doherty, Conor M Dowling and Costas Panagopoulos. 2013. "Big Five Personality Traits and Responses to Persuasive Appeals: Results from Voter Turnout Experiments." *Political Behavior* 35(4):687–728.
- Gerber, Alan S, Gregory A Huber, David Doherty, Conor M Dowling and Shang E Ha. 2010. "Personality and Political Attitudes: Relationships across Issue Domains and Political Contexts." *American Political Science Review* 104(1):111–133.
- Gerring, John. 2012. "Mere Description." *British Journal of Political Science* 42(4):721–746.
- Goldberg, Lewis R. 1982. "From Ace to Zombie: Some Explorations in the Language of Personality." *Advances in Personality Assessment* 1:203–234.
- Gosling, Samuel D, Peter J Rentfrow and William B Swann Jr. 2003. "A Very Brief Measure of the Big-Five Personality Domains." *Journal of Research in Personality* 37(6):504–528.
- Greene, Samuel and Graeme Robertson. 2017. "Agreeable Authoritarians: Personality and Politics in Contemporary Russia." *Comparative Political Studies* 50(13):1802–1834.
- Hasmath, Reza, Jessica C Teets and Orion A Lewis. 2019. "The innovative personality? Policy making and experimentation in an authoritarian bureaucracy." *Public Administration and Development* 39(3):154–162.
- Hassan, Mai. 2017. "The strategic shuffle: Ethnic geography, the internal security apparatus, and elections in Kenya." *American Journal of Political Science* 61(2):382–395.
- Havel, Vaclav. 1993. "The Postcommunist Nightmare." *New York Review of Books* 40(10):8.

-
- Henrich, Joseph, Steven J Heine and Ara Norenzayan. 2010. "Most people are not WEIRD." *Nature* 466(7302):29–29.
- Ho, Arnold K, Jim Sidanius, Nour Kteily, Jennifer Sheehy-Skeffington, Felicia Pratto, Kristin E Henkel, Rob Foels and Andrew L Stewart. 2015. "The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO-7 scale." *Journal of Personality and Social Psychology* 109(6):1003.
- Honaker, James, Gary King, Matthew Blackwell et al. 2011. "Amelia II: A program for missing data." *Journal of statistical software* 45(7):1–47.
- Huang, Haifeng. 2015. "Propaganda as Signaling." *Comparative Politics* 47(4):419–444.
- Huang, Haifeng. 2018. "The Pathology of Hard Propaganda." *The Journal of Politics* 80(3):1034–1038.
- Jensen-Campbell, Lauri A, Ryan Adams, David G Perry, Katie A Workman, Janine Q Furdella and Susan K Egan. 2002. "Agreeableness, Extraversion, and Peer Relations in Early Adolescence: Winning Friends and Deflecting Aggression." *Journal of Research in Personality* 36(3):224–251.
- Jones, Daniel N and Delroy L Paulhus. 2014. "Introducing the short dark triad (SD3) a brief measure of dark personality traits." *Assessment* 21(1):28–41.
- Kim, Wonik and Jennifer Gandhi. 2010. "Coopting Workers Under Dictatorship." *The Journal of Politics* 72(3):646–658.
- King, Gary, Jennifer Pan and Margaret E Roberts. 2013. "How Censorship in China Allows Government Criticism but Silences Collective Expression." *American Political Science Review* 107(2):326–343.
- King, Gary, Jennifer Pan and Margaret E Roberts. 2014. "Reverse-engineering Censorship in China: Randomized Experimentation and Participant Observation." *Science* 345(6199):1251722.
- King, Gary, Jennifer Pan and Margaret E Roberts. 2017. "How the Chinese Government Fabricates Social Media Posts for Strategic Distraction, Not Engaged Argument." *American Political Science Review* 111(3):484–501.

-
- Kuran, Timur. 1991. "Now Out of Never: The Element of Surprise in the East European Revolution of 1989." *World politics* 44(01):7–48.
- Lee, Kibeom and Michael C Ashton. 2004. "Psychometric Properties of the HEXACO Personality Inventory." *Multivariate Behavioral Research* 39(2):329–358.
- Levitsky, Steven and Lucan Way. 2013. "The durability of revolutionary regimes." *Journal of Democracy* 24(3):5–17.
- Lewis, Orion, Jessica Teets and Reza Hasmath. 2018. Exploring political personalities: The micro-foundations of local policy innovation in China. In *American Political Science Association Annual Conference (Boston, USA)*.
- Li, Lianjiang. 2004. "Political trust in rural China." *Modern China* 30(2):228–258.
- Li, Lianjiang. 2013. "The magnitude and resilience of trust in the center: evidence from interviews with petitioners in Beijing and a local survey in rural China." *Modern China* 39(1):3–36.
- Liu, Hanzhang. 2019. "The Logic of Authoritarian Political Selection: Evidence from a Conjoint Experiment in China." *Political Science Research and Methods* 7(4):853–870.
- Ludeke, Steven G, Timothy F Bainbridge, Jie Liu, Kun Zhao, Luke D Smillie and Ingo Zettler. 2019. "Using the Big Five Aspect Scales to translate between the HEXACO and Big Five personality models." *Journal of personality* 87(5):1025–1038.
- Ludeke, Steven, Michal Reifen Tagar and Colin G DeYoung. 2016. "Not as different as we want to be: Attitudinally consistent trait desirability leads to exaggerated associations between personality and sociopolitical attitudes." *Political Psychology* 37(1):125–135.
- Magaloni, Beatriz. 2006. *Voting for Autocracy: Hegemonic Party Survival and its Demise in Mexico*. Cambridge University Press.
- Magaloni, Beatriz and Ruth Kricheli. 2010. "Political order and one-party rule." *Annual review of political science* 13:123–143.
- Magidson, Jessica F, Brent W Roberts, Anahi Collado-Rodriguez and CW Lejuez. 2014. "Theory-driven intervention for changing personality: expectancy value theory, behavioral activation, and conscientiousness." *Developmental psychology* 50(5):1442.

-
- Manion, Melanie. 2015. *Information for Autocrats: Representation in Chinese Local Congresses*. Cambridge University Press.
- Manion, Melanie. 2017. ““Good types” in authoritarian elections: the selectoral connection in Chinese local congresses.” *Comparative Political Studies* 50(3):362–394.
- McCrae, Robert R and Antonio Terracciano. 2005. “Universal features of personality traits from the observer’s perspective: data from 50 cultures.” *Journal of personality and social psychology* 88(3):547.
- Mondak, Jeffery J, Matthew V Hibbing, Damarys Canache, Mitchell A Seligson and Mary R Anderson. 2010. “Personality and Civic Engagement: An Integrative Framework for the Study of Trait Effects on Political Behavior.” *American Political Science Review* 104(1):85–110.
- Morse, Yonatan L. 2012. “The era of electoral authoritarianism.” *World Politics* 64(1):161–198.
- Nathan, Andrew J. 2003. “Authoritarian Resilience.” *Journal of Democracy* 14(1).
- Nugent, Elizabeth R. 2020. “The Psychology of Repression and Polarization.” *World Politics* 72(2):291–334.
- O’Brien, Kevin J. 1994. “Agents and Remonstrators: Role Accumulation by Chinese People’s Congress Deputies.” *The China Quarterly* 138:359–380.
- O’Brien, Kevin J. 1996. “Rightful resistance.” *World Politics* 49(1):31–55.
- O’Brien, Kevin J and Yanhua Deng. 2017. “Preventing Protest One Person at a Time: Psychological Coercion and Relational Repression in China.” *The China Review* pp. 179–201.
- Ozer, Daniel J and Veronica Benet-Martinez. 2006. “Personality and the Prediction of Consequential Outcomes.” *Annual Review of Psychology* 57:401–421.
- Pop-Eleches, Grigore and Joshua A Tucker. 2014. “Communist socialization and post-communist economic and political attitudes.” *Electoral Studies* 33:77–89.
- Posner, Daniel N. 2005. *Institutions and Ethnic Politics in Africa*. Cambridge University Press.
- Ratigan, Kerry and Leah Rabin. 2020. “Re-evaluating Political Trust: The Impact of Survey Nonresponse in Rural China.” *The China Quarterly* 243:823–838.

-
- Repnikova, Maria. 2017. *Media politics in China: Improvising power under authoritarianism*. Cambridge University Press.
- Reuter, Ora John and David Szakonyi. 2015. "Online Social Media and Political Awareness in Authoritarian Regimes." *British Journal of Political Science* 45(1):29–51.
- Reuter, Ora John and Graeme B Robertson. 2014. "Legislatures, Cooptation, and Social Protest in Contemporary Authoritarian Regimes." *Journal of Politics* 77(1):235–248.
- Roberts, Brent W and Daniel Mroczek. 2008. "Personality Trait Change in Adulthood." *Current directions in psychological science* 17(1):31–35.
- Roberts, Margaret E. 2018. *Censored: Distraction and Diversion Inside China's Great Firewall*. Princeton University Press.
- Schedler, Andreas. 2009. "Electoral authoritarianism." *The SAGE handbook of comparative politics* pp. 381–94.
- Schwaba, Ted and Wiebke Bleidorn. 2018. "Individual Differences in Personality Change Across the Adult Life Span." *Journal of personality* 86(3):450–464.
- Shen, Xiaoxiao and Rory Truex. 2020. "In Search of Self-Censorship." *British Journal of Political Science* pp. 1–13.
- Shih, Victor, Christopher Adolph and Mingxing Liu. 2012. "Getting ahead in the communist party: explaining the advancement of central committee members in China." *American Political Science Review* 106(1):166–187.
- Sibley, Chris G, Danny Osborne and John Duckitt. 2012. "Personality and political orientation: Meta-analysis and test of a Threat-Constraint Model." *Journal of Research in Personality* 46(6):664–677.
- Slater, Dan. 2009. "Revolutions, Crackdowns, and Quiescence: Communal Elites and Democratic Mobilization in Southeast Asia." *American Journal of Sociology* 115(1):203–254.
- Smith, Benjamin. 2005. "Life of the party: The origins of regime breakdown and persistence under single-party rule." *World politics* 57(3):421–451.
- Snyder, Richard. 2006. "Beyond Electoral Authoritarianism: The Spectrum of Nondemocratic Regimes." *Electoral Authoritarianism: The Dynamics of Unfree Competition* pp. 219–231.

-
- Stieger, Mirjam, Sandro Wepfer, Dominik Rügger, Tobias Kowatsch, Brent W Roberts and Mathias Allemand. 2020. "Becoming more conscientious or more open to experience? Effects of a two-week smartphone-based intervention for personality change." *European Journal of Personality* 34(3):345–366.
- Stockmann, Daniela. 2013. *Media Commercialization and Authoritarian Rule in China*. Cambridge University Press.
- Svolik, Milan W. 2012. *The Politics of Authoritarian Rule*. Cambridge University Press.
- Tang, Wenfang. 2005. *Public Opinion and Political Change in China*. Stanford University Press.
- Tang, Wenfang. 2016. *Populist Authoritarianism: Chinese Political Culture and Regime Sustainability*. Oxford University Press.
- Tanner, Murray Scot. 2004. "China rethinks unrest." *The Washington Quarterly* 27(3):137–156.
- Teets, Jessica C. 2013. "Let many civil societies bloom: The rise of consultative authoritarianism in China." *The China Quarterly* pp. 19–38.
- Treisman, Daniel. 2011. "Presidential Popularity in a Hybrid Regime: Russia under Yeltsin and Putin." *American Journal of Political Science* 55(3):590–609.
- Truex, Rory. 2016. *Making Autocracy Work: Representation and Responsiveness in Modern China*. Cambridge University Press.
- Truex, Rory. 2019. "Focal Points, Dissident Calendars, and Preemptive Repression." *Journal of Conflict Resolution* 63(4):1032–1052.
- Tsai, Lily L. 2015. "Constructive noncompliance." *Comparative Politics* 47(3):253–279.
- Verona, Edelyn, Christopher J Patrick and Thomas E Joiner. 2001. "Psychopathy, Antisocial Personality, and Suicide Risk." *Journal of Abnormal Psychology* 110(3):462.
- Volk, Anthony A, Katerina Schiralli, Xiaoyang Xia, Junru Zhao and Andrew V Dane. 2018. "Adolescent bullying and personality: A cross-cultural approach." *Personality and Individual Differences* 125:126–132.
- Walton, Kate E and Brent W Roberts. 2004. "On the Relationship Between Substance Use and Personality Traits: Abstainers are Not Maladjusted." *Journal of Research in Personality* 38(6):515–535.

-
- Wang, Yuhua. 2014. "Coercive capacity and the durability of the Chinese communist state." *Communist and Post-Communist Studies* 47(1):13–25.
- Wang, Yuhua and Carl Minzner. 2015. "The Rise of the Chinese Security State." *The China Quarterly* 222:339–359.
- Wedeen, Lisa. 2015. *Ambiguities of Domination: Politics, Rhetoric, and Symbols in Contemporary Syria*. University of Chicago Press.
- Wu, Junhui, Mingliang Yuan and Yu Kou. 2020. "Disadvantaged early-life experience negatively predicts prosocial behavior: The roles of Honesty-Humility and dispositional trust among Chinese adolescents." *Personality and Individual Differences* 152:109608.
- Yang, Jian, Robert R McCrae, Paul T Costa Jr, Xiaoyang Dai, Shuqiao Yao, Taisheng Cai and Beiling Gao. 1999. "Cross-cultural personality assessment in psychiatric populations: The NEO-PI—R in the People's Republic of China." *Psychological Assessment* 11(3):359.
- Young, Lauren E. 2019. "The psychology of state repression: Fear and dissent decisions in Zimbabwe." *American Political Science Review* 113(1):140–155.
- Young, Lauren E. 2020. "Who dissents? Self-efficacy and opposition action after state-sponsored election violence." *Journal of Peace Research* pp. 62–76.
- Zhang, Jing, Matthias Ziegler and Delroy L Paulhus. 2020. "Development and evaluation of the short Dark Triad–Chinese version (SD3-C)." *Current Psychology* 39(4):1161–1171.
- Zheng, Chuhua, Qiong Wu, Yan Jin and Yanhong Wu. 2017. "Regional gray matter volume is associated with trait modesty: Evidence from voxel-based morphometry." *Scientific reports* 7(1):1–8.