Patience as the Rational Foundation of Sociotropic Voting

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Abstract

Economic voting is one of the most important mechanisms on explaining voting behavior and on establishing the democratic accountability. However, people tend to use perceived national economic condition on evaluating the incumbent, which is known as sociotropic voting, instead of their pocketbook. Previous studies suggest both altruism and self-interested future expectation may help explain this seemingly irrational behavior, but empirical works have not yet found convincing evidence to prove or disprove the self-interested motivation. This article suggests that patience makes people discount less on the potential future influence of the current national economic change; if self-interest drives sociotropic voting, patient voters would be more sociotropic. Consistent with the hypothesis, individual-level data from 2014 Comparative Congressional Election Survey shows that patient voters rely more on the perceived national economic change to evaluate the incumbent and make vote choice. Limited evidences on the linkage between impatience and pocketbook voting among non-partisans, the null finding linking sociotropic voting and altruism, and the country-level correlations are also provided.

Keywords. Patience; Discount Factor; Economic Voting; Sociotropic Voting

Introduction

> *"When you think economics, think elections; when you think elections, think economics."* (Tufte, 1980, pp. 65)
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> *"One of the characteristics of democratic times is that all men have a taste for easy successes and immediate pleasures...men do not want to think beyond tomorrow."* (De Tocqueville, 1972)

Economic voting is one of the most important mechanisms for explaining voting behavior and the establishing accountability of the democratic system. Voters reward the incumbent when they feel the times are good, and ask for the turnover when the times are bad. Abundant researchers suggest significant relationship between economic performance and election outcome around the world (e.g. Lewis-Beck and Stegmaier, 2000; Kayser, 2014).

Given the economic growth, not everyone can enjoy the fruit at the same time. Some economic reform may improve the national economy and competitive strength of a country in the long run, but tens of thousands of people may lose their job during the process. More specifically, people may feel differently on the personal and national economic condition. For example, in the 2012 ANES survey, 5.9% of respondents (226 in 3783) reported that their family income got worse in the previous year while national economic went up, and 7.2% (274) believed the national economy was declining but their family income raised. Thus, studies on economic voting distinguish between "pocketbook" and "sociotropic" voting: pocketbook voting is the choice that voter rewards incumbent in the election owing to the improvement of personal economic condition, while sociotropic voting describes the behavior when voter evaluates the incumbent based on national economic change. Generally speaking, macro and micro-level data suggest that most voters in the U.S. are sociotropic ones (e.g. Kinder and Kiewiet, 1981; Markus, 1988; MacKuen, Erikson and Stimson, 1992).

But, why are voters sociotropic? The sociotropic orientation seems to contradict with the *Homo economicus* assumption: self-interest. In the 2012 ANES, for instance, among those who perceived that the national economy got better but personal one went down, 78.3% of them still voted for the incumbent. In contrast, only 28.1% of voters supported the incumbent who observed the decline of the national economy and given the increase of personal one in the previous years.

One possible explanation for the sociotropic voting is altruism (Kinder and Kiewiet, 1981; Edlin, Gelman and Kaplan, 2007; Kiewiet and Lewis-Beck, 2011). Voter evaluates the incumbent basing on not her own condition, but the well-being of all Americans. Voter supports the incumbent merely because he or she believed other people have a better life led by this incumbent.

Apart from altruism, in the original piece Kinder and Kiewiet (1981) also suggest a possible foundation of economic rationality behind the sociotropic voting: *...Prototypic sociotropic voters may construe the incumbent administration's handling of the economy as a public good, and thus use the incumbent's ability to promote (eventually) their own economic welfare - and only incidentally that of fellow citizens as well.* The sociotropic consideration outweighs the pocketbook one because voters believe the growing national economy will eventually trickle down to their pocket one day in the future. Taking the expected future personal gain into consideration, self-interested voters support the well-performed incumbent despite current pocketbook lose, as is reflected in the ANES data.

If Kinder and Kiewiet's guess is right, there is one key determinant on constructing the self-interest foundation of sociotropic voting: *patience.* A voter who observed good national economy must be patient enough to wait until the trickle-down effect comes true one day in the future. Similarly, a future-oriented voter can see the future negative influence on his pocketbook from the current national economic decline. Therefore, patient voters are much sensitive to the performance of the national economy because they take its future influence

on his pocketbook into account; they are "self-interested sociotropic" voters accordingly. In contrast, if the voter discounts the future outcome a lot, he may care less about the potential trickle-down economic gain. In this scenario, the national economic condition would be less influential on impatient people's vote choice.

The exploration on the patience may also help disentangle the altruistic and self-interest factors behind sociotropic voting. After four decades of research on economic voting since Kinder and Kiewiet (1981), Kiewiet and Lewis-Beck (2011) still warn the lack of empirical evidence on distinguishing between the self-interest and public interest motivation. If there is a positive correlation between individual patience and sociotropic voting, the evidence may provide the foundation for the self-interest mechanism. If no evidence linking patience and sociotropic voting is found, the self-interest hypothesis is less supported. The exploration in this article cannot rule out the influence of altruism, but it may help explore the economic rationality behind the sociotropic voting.

The remainder of this paper is organized as follows. In Section 2, I will selectively review recent works on individual patience and human behavior, which is widely neglected in political science granted its theoretical importance. Section 3 discusses the hypothetical linkages between patience and sociotropic voting. Section 4 presents the individual-level empirical examination using 2014 Cooperative Congressional Election Study (CCES hereafter) survey data ($n = 1000$). Section 5 concludes the main findings and renders preliminary analysis on the country-level data linking patience, economic performance, and party linkage strategy.

Patience as pivotal determinants of human behaviors

Before the discussion of patience and economic voting, one may ask: why are people impatient? Why do people put more weight on the immediate outcome while discounts the distant one? Actually, this question is firstly asked by *political* economists over one hundred

and fifty years ago. Cited in Loewenstein and Elster (1992), both Senior (1836) and Jevons (1871) argued that people should view the equal treatment of the present and future as a behavioral norm. If the goal of a rational man is to maximize the accumulated utility within the lifespan, it then seems irrational to consider the utility of a future event as less important relative to the myopic alternative. In the case of sociotropic voting, a rational voter should always consider the potential future influence of the current national economic condition to his personal affair. There are two main theories to explain why people tend to deviate from the norm of rationality: risk and future-self connectedness. Both of them cope with recent findings on the relationship between patience and limited cognitive resource of human beings.

The first explanation for impatience is the risk. Because the outcome of the far future event has not happened yet and might change, risk-averse people would prefer the certainty, which means the event occurs immediately. Moreover, if an individual dies unexpectedly due to an accident or sickness, he/she can never receive the utility of the future outcome. However, although many studies have found a robust correlation between risk and time preference (e.g. Gafni and Torrance, 1984; Andersen et al., 2008), they remain two distinct concepts. On the one hand, if the risk is in the future, whether people change the behavior following the risk is, indeed, decided by discounting factor; farsighted people seek insurance if the potential damage from the future risk is large, but will do nothing when either there is no risk or the risk is huge but he discounts it totally. On the other hand, participants in the many laboratory experiments still discounted the future even though the future payoff was ensured by the experimenters; among the studies of time preference that utilized the choice battery, some people always chose the smaller and immediate reward even when researchers *guaranteed* the greater and delayed rewards (Chapman and Weber, 2006).

The second potential explanation for patience comes from the philosophical debate. According to Loewenstein, Read and Baumeister (2003), there are two views of personal iden-

tity: simple and complex. The simple view is that there is an irreducible entity of "I" that remains unchanged over time; an individual has no reason to discount the future self. The complex view argues that the personal identity across time is based on reducible characteristics (Parfit, 1984). One may forget previous experiences while the cells on one's body are continuously renewed; therefore, people discount the future event because the future-self and the current-self are different. The value of the discount factor is therefore decided by an individual's subjective future-self connectedness. (Bartels and Rips, 2010) conduct 5 surveys to show that an individual's future-self connectedness positively correlates to his personal discounting factor.

Risk and future-self connectedness influence an individual's patience through the limited cognitive resource. In the two previous explanations, people must imagine and calculate the future risk or future-self, each of which spends extra mental energy (Kruglanski et al., 2012). Recent studies in neuroscience suggest that the choice of delayed reward is a deliberative cognitive process: an individual *automatically* prefer immediate reward, but the consciousness will control the impulse and compare the immediate reward with delayed one; McClure et al. (2004, 2007) use fMRI to show that there are different neural systems value immediate and delayed monetary reward. Therefore, although the future outcome provides the same utility to the current one, an individual can receive an immediate reward after choosing the nearer alternative but must expend extra energy to imagine the feeling of receiving future rewards. For example, Hofmann et al. (2008) showed that an individual's working memory capacity influences their self-regulation behavior. [1] In short, one's discounting of a distant outcome, or, impatience, is used as a cognitive energy-saving tool.

Patience is widely explored in the field of economics and psychology. In economics, patience is called intertemporal choice, and is usually formalized and measured as discounting

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[1]This theory also helps to explain the hyperbolic discounting rate, which means that people discount more between the two near events than the two distant ones. The reason behind this is that the difference of energy expended on imagining two distant events is less than the difference of two near events.

factor. Intertemporal choice refers to the calculation of payoffs occurring at different times (Frederick, Loewenstein and O'donoghue, 2002). People invest in a resource because it is expected to yield a stream of payoffs over a single time period or a delayed payoff that is altogether greater than the payoff received from the single period alone. In psychology, patience is defined as self-regulation or future-orientation, and numerous scale is established to capture individual's time preference (e.g. Strathman et al., 1994; Zimbardo and Boyd, 2008). Patience is widely considered to be both a personal characteristic and a skill (Hofmann et al., 2008), which is pivotal in the determination of human behaviors such as drug use (Kirby, Petry and Bickel, 1999), smoking (Hardisty et al., 2013), academic performance (Funder, Block and Block, 1983), risk driving (Zimbardo, Keough and Boyd, 1997), and weight control (Chabris et al., 2008).

Theoretically, patience also plays a crucial role in the function of democracy. In democratic theory, Mill (1861) and Diamond (1999) believed that when citizens are educated to look beyond their immediate interests, they are likely to recognize the just demands of others and to act and think on behalf of public interests. The concepts of civic community Putnam, Leonardi and Nanetti (1994) and self-governing capabilities Ostrom (1997) are crucial to sustaining and deepen the democracy in the long run,but they cannot be formed without the willingness of the people to spend their time and resources participating at the beginning of democratization. Galston (1988) and Hoppe (2001) warned that democracy might fall into a process of decivilization owing to elections. When people cannot see beyond the nearest election, vote-seeking candidates have an incentive to align themselves with myopic policies.

In formal model and decision theory, the concept of patience in political science is usually captured as the discounting factor, which is influenced by the economists (Samuelson, 1937; Loewenstein and Elster, 1992; Wilson, 2011). In the classic works on cooperation and negotiation in the social choice dilemma, Taylor (1976), Axelrod (1981), and Acemoglu (2006) argued that people with a larger discounting factor may jump out of the tragedy of the com-

mons and reach Pareto-optimal outcomes, such as the emergence of state and public goods provision, in addition to revolting against the dictator. People who discount the future less can see and calculate the future benefit they will receive from a stable and democratic government; therefore, they are more willing to invest their time and resources to cooperate with other players rather than defect. To summarize, patience influences how people think about politics, how people engage in the political process, and how the democracy will evolve.

Despite its theoretical importance, few empirical studies have explored the relationship between individual patience and political behaviors (Loewenstein and Elster, 1992, Chapter 2). The keyword related to patience, including discounting factor, time horizon, intertemporal choice, self-regulation, or myopia, appear nowhere in the *Oxford Handbook of Political Behavior* (Dalton and Klingemann, 2007). Even though the discounting factor is widely used in the models theorizing political behavior and preference (Wilson, 2011), the nature and the content of the discounting factor remains largely unexplored, not to mention the empirical examination of its relationship to political behavior. [2]

One exception, to my knowledge, is Fowler and Kam (2006)'s study on the relationship between patience and turnout rate. The article is titled "patience as political virtue," because the time cost in the Election Day for showing up is immediate, but the policy reward may not be realized in the near future. Therefore, patient voters who discount the future policy outcome less are much likely to go out and vote. Fowler and Kam analyze responses from 235 undergraduate students taking an introductory political science course in California and reveals that patience provides a significant impact on turnout, controlling for civic duty,

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[2]Previous studies on economic voting and democratic accountability usually assume or reveal that voters are, in general, myopic. But the word "myopic" is used for describing the phenomenon that voters tended to respond to recent economic change rather than the economic performance a few years ago (see Lewis-Beck and Paldam (2000) for a review). However, this viewpoint is challenged by a recent study (e.g. Bechtel and Hainmueller, 2011; Hellwig and Marinova, 2015; Wlezien, 2015). The goal of this article is to test the self-interest motivation coming from the future behind the sociotropic voting. Voters can (bayesian) updated their perception on the national and personal economy either based on recent or past experience, but they then use this information to evaluate the incumbent and expect for possible future trickle-down effect. Besides, most of these studies are based on macro-level data and underestimate individual-level differences.

political interest, church attendance, and sociodemographic backgrounds. [3]

Patience and self-interested sociotropic voting

This article intends to provide one more theoretical linkage between patience and political behavior along with empirical falsification. The influence of the national economy on personal welfare is, in general, indirect and not immediate. For the majority of the people, a slight increase on unemployment rate or the gradual decline in GDP growth may not have an immediate impact on their income or employment status. Therefore, if self-interest is the main motivation behind sociotropic voting, this individual motivation is moderated by how much he or she discounts the outcome of the future event. Patient people may perceive the future negative impact on their pocketbook owing to the current decline of the national economy, and vice versa. For impatient people, however, considering the future outcome from the national economy is a cognitive energy-consuming process. They instead tend to focus more on the immediate pocketbook records.

Meanwhile, altruism is the social preference of other-regardingness. An individual evaluates the incumbent by the national economy because she wants other people in the society to live better (Simon, 1995; Edlin, Gelman and Kaplan, 2007). In this scenario, patience may also moderate the altruistic utility: if an individual's utility function is built on the utility of the others, then the long-term influence from the current national economic change may also render long-term impact on other people.[4] However, I assume that the moderation effect of the patience on self-interest motivation would be stronger than the effect on altru-

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[3]Another exception is Healy and Malhotra (2009)'s study on natural disaster policy and vote choice. They found that voters support the incumbent who spent more on disaster relief spending rather than prevention, which is later is much economically efficient. This article is different from theirs in two aspects. First, their study is county-level (And meanwhile, as is described by the authors, most of the spending are made to individuals.). Second, the difference between prevention and relief is calculated by the authors rather than the voters. Therefore, voter may change their behavior once they subjectively perceived the difference.

[4]I really appreciate the reviewer for the helpful comment on linking patience and altruism.

ism. Following the law of diminishing marginal utility, since the altruistic sociotropic voters believe that other people have immediate gain thanks to the improved national economy, the marginal utility for the gain coming in the future is relatively low. In contrast, in the eye of the self-interested sociotropic voters, they are comparing zero or negative gain now and some positive gains in the future; thus, they would perceive higher marginal utility gain.

Besides, if altruism is the main mechanism behind sociotropic voting, we would expect to see sociotropic voter to have more pro-social behavior or other-regardingness attitude, both of which can be empirically verified.

How about the impatient voters? In my theory, impatient voters may also be sociotropic owing to altruism. But when people discount the future a lot and focus merely on immediate personal interest, it would be rational for them to reward or punish the incumbent basing on their pocketbook record right before the Election Day. In this scenario, the impatient voter would behave closer to the definition of rational economic man.

To sum up, if patience plays no role in the economic voting, it implies that voters care less about the possible trickle-down effect from the current national economic change. Thus, we can be more confident that it is the altruism that contributes to this sociotropic behavior. In contrast, if patient voters are much more sensitive to the national economic condition, then it is much likely that both the self-interest and altruism drive the sociotropic voting. In addition, if the impatient voters are more sensitive to the pocketbook record, it implies that self-interest may play an even more important role in explaining economic voting. Patience may not confirm the existence of self-interested sociotropic voting, but it can serve as the bridge of rationality that makes the self-interest factor possible.

H_1: *Patient people tend to be sociotropic voter.*

H_2: *Impatient people tend to be pocketbook voter.*

Sociotropic voting is defined as that the perceived national economic condition significantly influence a voter's support for the incumbent, while pocketbook is from perceived change in family income. Therefore, H_1 and H_2 can be operationalized by using interaction term in the regression model. The regression model would be like:

$$VoteIncumbent = \beta_0 + \beta_1 \times NationalEco + \beta_2 \times PersonalEco + \beta_3 \times Patience + \beta_4 \times$$
$$NationalEco \times Patience + \beta_5 \times PersonalEco \times Patience + controls + \epsilon$$

According to H_1 , both β_1 and β_4 should be positive, indicating that people in average are sociotropic voters, but patient people rely more on the perceived national economy on evaluating the incumbent. When people perceived that the national economy goes well, patient people are much likely to vote incumbent; if an individual perceived the decline of the national economy, patient people blame the incumbent much severely. If only β_1 is significant but not β_4, it implies the rational foundation behind the self-interest sociotropic voting is less supported, and the altruism may be much important. In addition, β_5 can examine the hypothesis H_2: if self-interest is the driving force behind economic voting, impatient voters would be highly motivated to evaluate incumbent by the change pocketbook before the Election Day.

Needless to say, personal and national economic condition are not the only influential factors on individual vote choice. Based on the Eurobarometer data from 1976 to 1992, (Kayser and Wlezien, 2011) find out that economic voting is contingent on the pattern of partisanship. When an individual does not identify himself with any specific party, he may rely more on the perceived economic condition while making vote choice. Therefore, in the regression model, the party identification should be controlled. Moreover, Kayser and Wlezien's result suggest that H_1 and H_2 would find stronger supportive evidence among the non-partisan voters. Thus I would analyze the result on both full and non-partisan samples respectively. Other controls including gender, race, educational level, and family income are

also included in the regression model.

Analysis

Data and measures

The empirical analysis on the individual patience and sociotropic voting is based on 2014 Cooperative Congressional Election Survey. In the module, 1000 respondents were asked about their level of patience (discussed later), perceived national and family economic condition, vote choice in 2012 and in 2014, party identification, and socio-demographic background. The analysis is done by R 3.1.3, and the logit models are estimated by the *glm* function.

In 2014 CCES, two items are used to measure individual patience. The description and option of the two items are as followed: "Imagining you will receive a certain amount of money. Which of the following way do you prefer? (A) To gain $10 today (B) To gain $20 six months year later" and "(A) To gain $1000 today (B) To gain $2000 a year later." The design of the items is similar to the discounting rate choice battery (DR hereafter) in economics (Frederick, Loewenstein and O'donoghue, 2002; Hardisty et al., 2013). Those who prefer delayed and larger rewards are assumed to have more patience and higher self-control, and those who choose immediate but smaller rewards are believed to be myopic and emotional (Berns, Laibson and Loewenstein, 2007; Metcalfe and Mischel, 1999). The more items are asked, the more precisely the researcher is able to estimate the discounting rate for an individual participant. Recent studies show that the measure of patience based on this design has been found with good test-retest stability (Kirby, 2009), and the measurement positively correlates with other scales measuring self-regulation and future-orientation created by psychologists (Daly, Harmon and Delaney, 2009; Vischer et al., 2013). In political science, 20 items are designed in DR battery used by Fowler and Kam (2006), which fixes

the immediate payment to be \$100 in 30 days, and delayed payment in 60 days from \$ 100.17 to \$123.07. In comparison, only two items are allowed to put in the 2014 CCES. As a result, it would be imprecise to calculate the exact discounting rate for each respondent.

In this article, I simply assume those who choose the immediate but smaller reward on both items to be impatient ($Patience = 0$), and those who choose both delayed and larger rewards are patient ($Patience = 1$). In the 2014 CCES, 393 (39.3%) are coded as impatient while 375 (37.5 %) are patient. This distribution suggests enough variance for further analysis, and people are not choose at random. [5] Besides, measuring patience by using two or less DR item is not uncommon, albeit not perfect (e.g. Klochko and Ordeshook, 2005; Wang, Rieger and Hens, 2016). Moreover, to suggest the credibility of the two-item DR measure, I can examine whether the measure has similar properties with previous studies. In the 2014 CCES, consistent with previous studies, being patient positively correlates with educational level (Duckworth and Seligman, 2005) ($r = 0.28, p < 0.01$), family income (Harrison, Lau and Williams, 2002) ($r = 0.28, p < 0.01$), regulating CO2 emission ($r = 0.07, p = 0.05$), and not correlates with age (Chao et al., 2009) ($r = 0.02, p = 0.51$). Therefore, in this article, I will use the binary coding on individual patience derived from the two items in the 2014 CCES.

The main dependent variable, $VoteIncumbent$, takes the value of 1 if the respondent voted for the incumbent Democratic party and 0 if not, following the political context. Besides, I also use the favorability ratings of the Democratic president for validity check (2= very favorable to -2 = very unfavorable). In the CCES 2014, respondents were asked to recall their vote choice in the 2012 Presidential election, to self-report the preference among candidates in the 2014 Gubernatorial election, and to evaluate how much they favor

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[5]It is also possible to calculate the range of discounting rate basing on the two items. There are 54 (5.4%) respondents who chose delayed reward in the first item (with smaller reward) but immediate one in the later item (with larger reward), and 178 (17.8%) with opposite choice. The main result and conclusion are not changed with different coding.

Barack Obama at that moment. All of the three items have pros and cons on examining the patience-sociotropic voting linkage. For the vote choice in 2012 presidential election, the president is widely believed to be responsible for the national economy, but the 2014 CCES was conducted two years after the election. Even though Kirby (2009) shows that an individual's level of patience has at least one-year stability, whether the assumption holds for more than two years is not without question. Moreover, it is possible that people's perceived economic condition had changed. For the 2014 election, the survey was conducted right before the Election Day (from October 1 to November 3). Even though the candidates in midterm election, say governors, should not be directly responsible for the national economy, previous studies still suggest that national economy or presidential approvals are important factors shaping the vote choice in the midterm election(Chubb, 1988; Cohen, 2007). For the favorability item, it is possible that people dislike the incumbent because he did a bad job. However, the relationship between favorability and vote choice might not be linear. After all, the topic of interest is vote choice. Given the limitations, the three measures cover some aspects of how an individual evaluates and rewards the incumbent, and can be used to examine the relationship between patience and sociotropic voting. Therefore, I will use the three items respectively as the dependent variable in regression models. Future work can be done with better measures such as survey in the year having a presidential election.

The two major independent variables, perceived national and personal economic conditions, are defined as followed. In the 2014 CCES, perceived national economy ($NationalEco$) is measured and coded from the item "Would you say that OVER THE PAST YEAR the nation's economy has ...? 2 = Gotten much better (4.6%)[6], 1 = Gotten better (22.8%), 0 = Stayed about the same (36.4%), -1 = Gotten worse (23.6%), -2 = Gotten much worse (9.0%)." The perceived personal economy ($PersonalEco$) is defined by the item "Over the

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[6]In the parenthesis is the distribution of CCES respondents, while 3.6% reported not sure or skip the national economy item. All of the subject answered the personal income item.

Past FOUR YEARS, has your households annual income...? 2 = Increased a lot (4.9%), 1 = Increased somewhat (25.6%), 0 = Stayed about the same (37.3%), -1 = Decreased somewhat (20.4%), -2 = Decreased a lot (11.7%)."

Results: full samples

Table 1 illustrates the relationship between patience and economic voting in the 2012 and 2014 election. In all six models, consistent with previous studies, the perceived change of the national economy strongly shaped vote choice in both the 2012 presidential and 2014 gubernatorial elections, and also the favorability of the president in 2014. Moreover, the interaction between patience and perceived national economy positively influence the vote choice in both elections, even controlling for socio-demographics and party identification. Both the partial coefficient of $NationalEco$ and $NationalEco \times Patience$ are positively different from zero in five of the six models, indicating H_1 received empirical support: patient voters are much sensitive to the national economic change. [7] Meanwhile, the perceived personal economic change has no effect on the vote choice, but renders some positive effect on the favorability. The difference alludes that the personal gain may make the incumbent much favorable, but it did not transfer to vote choice directly. That is the weakness of using favorability as is discussed before. Besides, the interaction between patience and the personal economy is negative among all models, but none of them reach a significant level, which implies that H_2 is not supported.

Figure 1 illustrates the moderation effect of patience on the sociotropic voting. The two lines in each cell indicate the predicted probabilities to vote for the incumbent party or favorability to the President, controlling all other variables in model 2, 4, and 6 in Table 1 at the mean, while the shadowed area is the plus and minus one standard error. Overall, both

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[7]The positive interaction effect between patience and perceived national economic condition in model 2 and 4 remain strong even when the interaction between educational level and perceived national economy is added in the model.

Table 1: Patience and Economic Voting in the 2012 and 2014 Election

	Dependent variable:					
	Vote Dem P in 2012		Vote Dem G in 2014		Dem Favorable 2014	
	(1)	(2)	(3)	(4)	(5)	(6)
NationalEco	0.846***	0.495***	0.529***	0.290**	0.772***	0.519***
	(0.127)	(0.157)	(0.120)	(0.135)	(0.074)	(0.064)
PersonalEco	0.141	0.242	0.072	0.096	0.138*	0.193***
	(0.115)	(0.148)	(0.115)	(0.130)	(0.073)	(0.061)
Patience	−0.199	0.289	−0.253	−0.028	−0.364***	−0.034
	(0.176)	(0.239)	(0.179)	(0.215)	(0.107)	(0.098)
NationalEco × Patience	0.695***	0.720***	0.419**	0.389*	0.211*	0.099
	(0.229)	(0.273)	(0.204)	(0.227)	(0.114)	(0.096)
PersonalEco × Patience	−0.263	−0.339	−0.090	−0.122	−0.110	−0.086
	(0.177)	(0.222)	(0.175)	(0.198)	(0.110)	(0.091)
Control Age, Male, Edu, Income, Race, and PID		Yes		Yes		Yes
Observations	745	670	745	670	627	564
Adjusted R^2					0.318	0.574
Log Likelihood	−414.426	−273.849	−417.238	−336.463		
Akaike Inf. Crit.	840.852	573.698	846.475	698.927		

Note: *p<0.1; **p<0.05; ***p<0.01

patient and impatient voters use national economy to evaluate the incumbent, which is shown as the positive slope in both lines. Compared to the impatient counterpart, however, patient people are much sensitive to the national economic change; they reward the incumbent more when the perceived time is good, and punish the incumbent much harshly when the perceived time is bad. Since the interaction between patience and perceived national economy is positive, it indicates that people take the possible future outcome seriously. I suggest the behavioral difference between patient and impatient voters on sociotropic voting is partially owing to the self-interest consideration as is discussed earlier. However, even among the impatient voters, sociotropic voting still exist. Therefore, empirical evidence from 2014 CCES does not rule out the possible influence of altruism on explaining the sociotropic voting, but rather suggest that the moderation effect of patience can be seen as the rational foundation for the self-interest motivation.
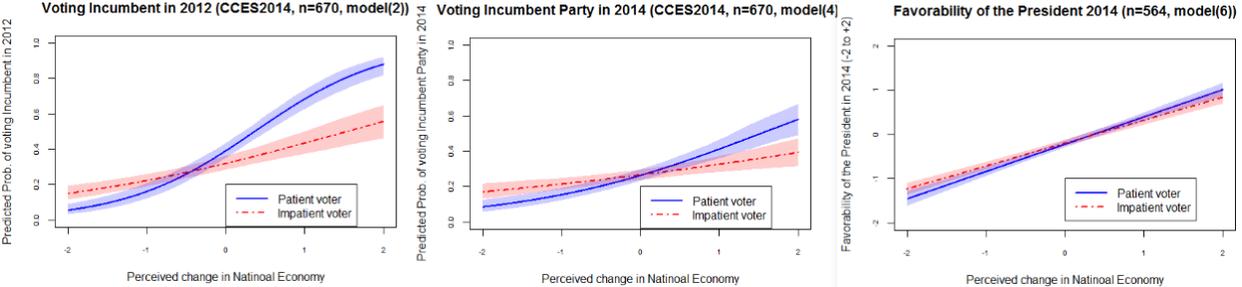

Figure 1: Voters with higher level of patience are much sensitive to the national economic change on evaluating the incumbent

Results: non-partisan samples

Table 2 presents how the patience influences economic voting among the non-partisan voters. In this table, H_2, the interaction between impatience and pocketbook voting, receives limited support on model 7 and 11. When $Patience = 1$, indicating patient non-partisans, the net effect of perceived personal economy, which can be calculated by adding up the estimated partial coefficients of $PersonalEco$ and the $PersonalEco \times Patience$, is indifferent

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from zero in all six models. The results suggest that patient non-partisan voters are not sensitive to the current pocketbook record ($\beta_2 + \beta_5 = 0$ in all six models, according to F-test of multivariate linear hypothesis), while impatient voters to some extent tend to have pocketbook voting ($\beta2 + 0 \times \beta5 > 0$ in model 8 and 12).

Table 2: Patience and Economic Voting among Non-partisans in the 2012 and 2014 Election

	Dependent variable:					
	Vote Dem P in 2012		Vote Dem G in 2014		Dem Favorable 2014	
	(7)	(8)	(9)	(10)	(11)	(12)
NationalEco	0.774***	0.620***	0.319*	0.254	0.606***	0.586***
	(0.190)	(0.210)	(0.188)	(0.201)	(0.116)	(0.117)
PersonalEco	0.296	0.343*	0.173	0.240	0.194	0.223*
	(0.180)	(0.199)	(0.187)	(0.197)	(0.120)	(0.119)
Patience	0.136	0.382	0.320	0.279	−0.381**	−0.115
	(0.264)	(0.308)	(0.270)	(0.305)	(0.173)	(0.185)
NationalEco × Patience	0.663**	0.763**	0.425	0.591*	0.302*	0.208
	(0.333)	(0.367)	(0.299)	(0.334)	(0.181)	(0.181)
PersonalEco × Patience	−0.596**	−0.445	−0.002	−0.122	−0.353**	−0.177
	(0.266)	(0.295)	(0.267)	(0.295)	(0.175)	(0.176)
Control Age, Male, Edu, Income, Race, and PID		Yes		Yes		Yes
Observations	343	304	343	304	230	203
Adjusted R^2					0.262	0.373
Log Likelihood	−182.563	−156.658	−180.319	−159.465		
Akaike Inf. Crit.	377.126	335.315	372.637	340.930		

Note: *p<0.1; **p<0.05; ***p<0.01

The difference between the impatient and patient people on pocketbook voting is further illustrated in Figure 2, which shows the predicted probability of non-partisans to vote for the incumbent in the 2012 and 2014 election, as well as the favorability of the incumbent. The predicted probability and value are based on model 8, 10, and 12. The shadowed area is plus and minus one standard error. In this figure, patient non-partisans are indifferent on the perceived personal economic change, while the impatient voters sensitively use pocketbook
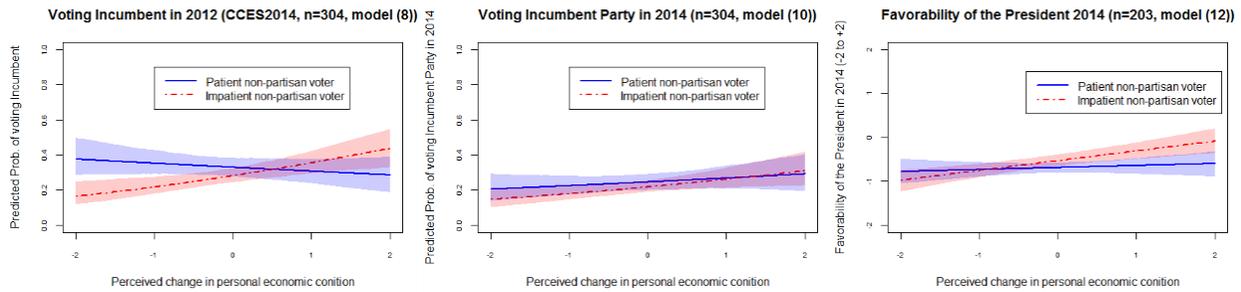
record on evaluating the incumbent.

Figure 2: Non-partisan voters with higher level of patience are much sensitive to the personal economic change on evaluating the incumbent

Sociotropic Voting and Altruism? Preliminary Rebuttal

The alternative explanation behind the sociotropic voting is that the change of national economy impacts on the welfare of other people, not on the respondent herself. If the altruistic concern is the main mechanism behind sociotropic voting, we should expect that sociotropic voters would have more pro-social attitude and behavior. Unfortunately, there is no direct measure of altruism in the CCES dataset, so I provide some preliminary examination on the sociotropic voting and some behavior and attitudes linking to other-regardingness.

At the beginning, I simply recoded a respondent as a "sociotropic voter" in 2012/2014 if she either (1) voted the incumbent in 2012 and 2014 and perceived the national economy is better, or (2) voted against the incumbent in 2012 and 2014 and perceived the national economy is worse. If the voter did not in this category, she is coded as a non-sociotropic voter. In the CCES 2014, 79.0% (485 in 614) are recoded as a sociotropic voter based on their vote choice in 2012, and 67.8% (416 in 614) in 2014, respectively.

The first test is its correlation to the blood donation. Blood donation is widely considered as an altruistic behavior, especially after the monetary incentive policy was canceled in 1975 (e.g. Alessandrini, 2007; Steele et al., 2008). Thankfully, respondents in the CCES

2014 dataset were also asked about their blood donation last year, which is the only both behavioral and non-political question in the survey. In the survey, 13.9% of respondents (119 in 854) had ever donated blood in the previous year.[8] However, for those sociotropic voters based on their 2014 vote choice, their blood donation rate is 12%, while among non-sociotropic voters is 18.7%; chi-squared test is nearly significant ($p = 0.057$). Based on the 2012 vote choice, there is no difference between sociotropic and non-sociotropic voters on their blood donation behavior (14.1% and 14.1%, respectively). By this standard, sociotropic voters are not more likely to donate blood.

The second test turns back to the political issues. For the domestic issues, separating the self-interested and altruistic motivation is not theoretically easy since the left-right ideology defines the diverse meaning of fairness and worthiness between citizens. For example, a voter who wants to cut government spending on social welfare may still love to help the poors through charity. In contrast, the definition of self-interest may be clearer on international issues. In the dataset, there are three binary questions asking respondents' attitude toward the military action to "destroying a terrorist camp," "ensure oil supply," and intervene the region with genocide or civil war." While the former two reasons are usually considered as the self-interested motivation, the same motivation is less clear behind the last scenario (Drezner, 2008). [9] Table 3 shows the sociotopric and non-sociotropic voters' attitude toward the three goals. In this table, sociotropic voters are much likely to support (to some extent) self-interested military action, and are less likely to support fully altruistic action like intervening the genocide.

Admittedly, the evidence provided in Table 3 is indirect and not strong since the voters may have different criteria evaluating domestic and international issues; she can be a altruis-

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[8]According to the America's Blood Center, the annual donation rate of the eligible donors in the U.S. is less than 10%. See http://www.americasblood.org/about-blood/facts-figures.aspx . Access Date: February 14, 2017.

[9]Also see https://www.thechicagocouncil.org/blog/running-numbers/american-public-opinion-syria . Access: February 14, 2017.

Table 3: Sociotropic Voting and Attitude toward Military Actions

	Destory terrorist camp	Ensure oil supply	Intervene the genocide
Sociotropic in 2012	65.9%*	19.2%	38.1%
Non-Sociotropic in 2012	51.5%*	21.2%	43.4%
Sociotropic in 2014	67.1%*	21.4%	37.4%
Non-Sociotropic in 2014	54.8%*	15.7%	42.8%

Note: *$p < 0.05$*

tic nationalist. However, these evidences suggest that sociotropic voters are at most with the same level of altruism, or less, than the non-sociotropic counterparts. When an individual's level of patience is moderating the perceived national economic change on the vote choice, it is much likely that the moderating effect comes from the consideration of future trickle down effect.

Discussion

In the twelve models, the moderation effect of patience on the sociotropic voting is mostly supported. When people are patient and discount the future less, their response to the perceived of the national economy is stronger than impatient ones. I suggest that the interaction effect comes mostly from the self-interest consideration behind the sociotropic voting, even though the altruistic motivation cannot be neglected. Farsighted people would take the future influence to their pocket from current economic change into consideration, so they rationally emphasize the importance of national economy much. The limited evidence on the relationship between impatience and pocketbook voting also suggests the self-interest consideration behind the economic voting, at least among the non-partisans. Therefore, the empirical data 2014 CCES suggests that patience is an important moderator who helps bridge the rationality with the sociotropic voting in the U.S.

There are three possible explanations of why H_2 is not strongly supported. First, the

measure of patience only includes two items, so the scale may fail to capture enough variance on the level of patience. Second, even though a wider scale is used, it is possible that people in the U.S. are, in general, patient enough. In this scenario, the effect of patience on pocketbook voting may not be found in the U.S. samples. Third, as is discussed before, all of the three dependent variables have their own limitations. These three problems can be put into the future work with better data collection. Moreover, the second point may be dealt with cross-country comparison, which preliminary analysis will be provided in the conclusion part.

Conclusion, limitation, and future work

Previous studies on the economic voting found that people are sociotropic voters, but researchers fail to distinguish between altruism and self-interest factor behind the sociotropic behavior. This article suggests that individual patience can be seen as the foundation of rationality behind the self-interest sociotropic voting, in which self-interested voter would be more sociotropic if they consider the future influence from current national economic change. Data from 2014 CCES shows that individual patience positively moderates the influence of perceived national economy on voting for the incumbent.

Patience or discounting factor, however, is the first step on linking self-interest and sociotropic voting. The discounting factor is an instrumental variable, or a coefficient, but not the outcome itself. Self-interest individual should first discount the future less, and he or she has to imagine to future of the national economy. In this article, I ignore the inclusion of perspective voting in the regression model owing to both theoretical and measurement concerns. The measure of perspective voting is to ask respondents to imagine the future of the national economy. But if the government is assumed to play the crucial role in the national economy in the past, then the future expectation would be the combination

of the observation of the performance of incumbent and the expected probability that the incumbent will be reelected. In other words, if an individual thinks the incumbent did well in its current term, he or she votes for the incumbent because of the expectation that the good performance will be continued in the future, which can be used to replace the measure of prospective voting. In this scenario, self-interest sociotropic voting may be regarded as a self-fulfilling prophecy. However, the expected future economic change should also include other external factors like the change of global economy or military threat. That is why I only call the patience as the rational foundation since at least one more step is needed to build the causal mechanism.

Admittedly, the result in this article has a hard time to reconcile with previous findings linking cognitive capability and economic voting (Gomez and Wilson, 2001, 2006). Gomez and his colleagues find that sophisticated voters are much likely to follow their pocketbook record. My response to the difference with their works is three-fold. First, this article suggests the future exploration of how the cognitive resource is used. In the CCES 2014, the correlation between individual patience and self-report knowledge level is not high ($r = 0.184, n = 821, p < 0.001$), and in Fowler and Kam (2006)'s study there is no correlation between patience and political information ($r = 0.03, n = 350 p = 0.71$). Second, there is no theoretical linkage that sophisticated voters should emphasize more on the potential future outcome. It can be possible that they discount the future more just because they have figured out how the politics is working. Third, the measure and usage of political knowledge scale are strongly criticized (Lupia, 2015). For instance, why does a voter who knows the chair of the Supreme Court can also know the process of the trickle-down economy? Lupia suggests that clearer theory is needed to link each item in the political knowledge scale to the target of interest.

In the macro-level, if patience makes voters sociotropic and impatience makes one pocketbook, the level of patience among the electorates in a country will influence the linkage

strategies proposed by the parties and candidates, so as to the policy outcome of the government. In the scenario that the majority of the voters are myopic, the incumbent will be reelected only if it can benefit enough voters within one term. One of the easiest methods for vote-seeking candidates to reach this goal is through vote-buying and clientelistic patronage (Scott, 1969; Magaloni, 2006); long-term economic reform is not welcomed by both voters and politicians. If the majority of the voters are far-sighted enough, the incumbent would be encouraged to propose painful and long-term economic reform, as is suggested by Stokes (1996). In the long run, the country with longer patience would have better performance on the national economy and programmatic linkage.

Limited evidence on the patience of the electorates, economic performance, and party linkage is provided in Figure 3 and 4. Data of level of patience among people in different countries is from Wang, Rieger and Hens (2016). Participants are undergraduate students from the department of economics, finance, and business administration in the 45 countries ($n = 5530$). The measure of the economic performance is GDP per capita in 2008, the year before Wang's paper being published. GDP data is from the Work Bank [10]. And the measure of party strategy is created by Democratic Accountability and Linkages Project (DALP hereafter). DALP conducted a survey on 1400 experts in 88 countries in 2008-2009 and created a clientelistic effort scale of a country ranging from 4 to 20 (Kitschelt, 2012). Figure 3 shows that is a significantly positive correlation between the two discounting factors δ and β and GDP per capita, with Pearson's $r = 0.43, p < 0.01, n = 37$ and $r = 0.45, p < 0.01, n = 37$. [11] Figure 4 presents that the negative correlations between clientelistic effort and the two discounting factors, with Pearson's $r = -0.29, p = 0.08, n = 35$ and $r = -0.30, p = 0.07, n =$

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[10]http://data.worldbank.org/indicator/NY.GDP.PCAP.CD?page=1. Search date: September 1, 2015.

[11]Wang, Rieger and Hens (2016) measure the patience by two matching questions: (1) \$ 100 now = \$ ( ) in one year from now. (2) \$100 now and \$( ) in 10 years from now. Participant's subjective time preference can be estimated by two parameters, δ and β in the hyperbolic discounting model. β is the level of present-bias, and δ is the traditional long-term discount factor, both of which represents the personal level of patience. To be specific, $\delta = (\frac{Q_1}{Q_2})^{1/9}$, and $\beta = \frac{100}{\delta Q_1}$.

35, respectively. There is a suggestive pattern between patience, economic performance, and clientelism.

Figure 3: Patience and Economic Development, Country-Level

Figure 4: Patience and Clientelistic Linkage Strategy, Country-Level

However, since cross-country data on patience is only one-shot, it is impossible to make a causal inference based on available data. Moreover, the relationship between patience and economic development may be theoretically dual-directional. Patience makes people future-oriented and sociotropic, and the reward of the improved national economy - increase in the pocketbook for the long-term - would, in turn, increase the patience of the individuals.

Nevertheless, the combination of the individual- and country-level results may help explain that why voters around the world *"emphasize different indicators at different times"*(Lewis-Beck and Paldam, 2000).

If the relation between patience and sociotropic voting can be formed as a positive feedback loop, the loop can be the double-edged sword, which accelerates both the civilization and decivilization process. For example, if there is an external shock to the loop undermining the patience among people, such as natural disaster Li et al. (2011), terrorism, or political scandal, people reflects their time preference through election: less sociotropic voting, more pocketbook ones. The winner then will exert policies according to the public impatience, which again undermines the patience of the public, as is warned by Hoppe (2001). Would the election make people myopic? Would the self-enforcing democracy collapse owing to the decline of public patience? More interesting research questions can be raised and empirically examined, if political scientists no longer treat discounting factor as a constant, but an important personal characteristic which is malleable, interacting with the political context, and predictive to political behaviors.

References

Acemoglu, Daron. 2006. *Economic origins of dictatorship and democracy.* Cambridge University Press.

Alessandrini, Megan. 2007. "Community volunteerism and blood donation: altruism as a lifestyle choice." *Transfusion medicine reviews* 21(4):307–316.

Andersen, Steffen, Glenn W Harrison, Morten I Lau and E Elisabet Rutstrm. 2008. "Eliciting risk and time preferences." *Econometrica* 76(3):583–618.

Axelrod, Robert. 1981. "The emergence of cooperation among egoists." *American Political Science Review* 75(02):306–318.

Bartels, Daniel M and Lance J Rips. 2010. "Psychological connectedness and intertemporal choice." *Journal of Experimental Psychology: General* 139(1):49.

Bechtel, Michael M and Jens Hainmueller. 2011. "How Lasting Is Voter Gratitude? An Analysis of the Short-and Long-Term Electoral Returns to Beneficial Policy." *American Journal of Political Science* 55(4):852–868.

Berns, Gregory S, David Laibson and George Loewenstein. 2007. "Intertemporal choicetoward an integrative framework." *Trends in cognitive sciences* 11(11):482–488.

Chabris, Christopher F, David Laibson, Carrie L Morris, Jonathon P Schuldt and Dmitry Taubinsky. 2008. "Individual laboratory-measured discount rates predict field behavior." *Journal of Risk and Uncertainty* 37(2-3):237–269.

Chao, Li-Wei, Helena Szrek, Nuno Sousa Pereira and Mark V Pauly. 2009. "Time preference and its relationship with age, health, and survival probability." *Judgment and Decision Making* 4(1):1.

Chapman, Gretchen B and Bethany J Weber. 2006. "Decision biases in intertemporal choice and choice under uncertainty: testing a common account." *Memory & cognition* 34(3):589–602.

Chubb, John E. 1988. "Institutions, the economy, and the dynamics of state elections." *American Political Science Review* 82(01):133–154.

Cohen, Jeffrey E. 2007. "The Polls: Presidential Referendum Effects in the 2006 Midterm Elections." *Presidential Studies Quarterly* 37(3):545–557.

Dalton, Russell J. and Hans-Dieter Klingemann. 2007. *Oxford handbook of political behavior.* Oxford University Press.

Daly, Michael, Colm P Harmon and Liam Delaney. 2009. "Psychological and biological foundations of time preference." *Journal of the European Economic Association* 7(2-3):659–669.

De Tocqueville, Alexis. 1972. *Democracy in America.* .

Diamond, Larry. 1999. *Developing democracy: Toward consolidation.* JHU Press.

Drezner, Daniel W. 2008. "The realist tradition in American public opinion." *Perspectives on Politics* 6(01):51–70.

Duckworth, Angela L and Martin EP Seligman. 2005. "Self-discipline outdoes IQ in predicting academic performance of adolescents." *Psychological science* 16(12):939–944.

Edlin, Aaron, Andrew Gelman and Noah Kaplan. 2007. "Voting as a rational choice why and how people vote to improve the well-being of others." *Rationality and society* 19(3):293–314.

Fowler, James H and Cindy D Kam. 2006. "Patience as a political virtue: Delayed gratification and turnout." *Political Behavior* 28(2):113–128.

Frederick, Shane, George Loewenstein and Ted O'donoghue. 2002. "Time discounting and time preference: A critical review." *Journal of economic literature* pp. 351–401.

Funder, David C, Jeanne H Block and Jack Block. 1983. "Delay of gratification: Some longitudinal personality correlates." *Journal of Personality and Social Psychology* 44(6):1198.

Gafni, Amiram and George W Torrance. 1984. "Risk attitude and time preference in health." *Management Science* 30(4):440–451.

Galston, William A. 1988. "Liberal virtues." *American Political Science Review* 82(04):1277–1290.

Gomez, Brad T and J Matthew Wilson. 2001. "Political sophistication and economic voting in the American electorate: A theory of heterogeneous attribution." *American Journal of Political Science* pp. 899–914.

Gomez, Brad T and J Matthew Wilson. 2006. "Cognitive heterogeneity and economic voting: A comparative analysis of four democratic electorates." *American Journal of Political Science* 50(1):127–145.

Hardisty, David J, Katherine F Thompson, David H Krantz and Elke U Weber. 2013. "How to measure time preferences: An experimental comparison of three methods." *Judgment and Decision Making* 8(3):236–249.

Harrison, Glenn W, Morten I Lau and Melonie B Williams. 2002. "Estimating individual discount rates in Denmark: A field experiment." *American economic review* pp. 1606–1617.

Healy, Andrew and Neil Malhotra. 2009. "Myopic voters and natural disaster policy." *American Political Science Review* 103(3):387–406.

Hellwig, Timothy and Dani M Marinova. 2015. "More Misinformed than Myopic: Economic Retrospections and the Voters Time Horizon." *Political Behavior* 37(4):865–887.

Hofmann, Wilhelm, Tobias Gschwendner, Malte Friese, Reinout W Wiers and Manfred Schmitt. 2008. "Working memory capacity and self-regulatory behavior: toward an individual differences perspective on behavior determination by automatic versus controlled processes." *Journal of personality and social psychology* 95(4):962.

Hoppe, Hans-Hermann. 2001. *Democracy-The God That Failed: The Economics and Politics of Monarchy, Democracy, and Natural Order.* Transaction Publishers.

Jevons, W. S. 1871. *Theory of Political Economy.* Toronto: University of Toronto Press.

Kayser, Mark A. 2014. "The Elusive Economic Vote." *Comparing Democracies* 4.

Kayser, Mark Andreas and Christopher Wlezien. 2011. "Performance pressure: Patterns of partisanship and the economic vote." *European Journal of Political Research* 50(3):365–394.

Kiewiet, D Roderick and Michael S Lewis-Beck. 2011. "No man is an island: self-interest, the public interest, and sociotropic voting." *Critical Review* 23(3):303–319.

Kinder, Donald R and D Roderick Kiewiet. 1981. "Sociotropic politics: the American case." *British Journal of Political Science* 11(02):129–161.

Kirby, Kris N. 2009. "One-year temporal stability of delay-discount rates." *Psychonomic bulletin & review* 16(3):457–462.

Kirby, Kris N, Nancy M Petry and Warren K Bickel. 1999. "Heroin addicts have higher discount rates for delayed rewards than non-drug-using controls." *Journal of Experimental Psychology: General* 128(1):78.

Kitschelt, Herbert. 2012. "Party Competition in India. Continued Weak Programmatic Structuration of Partisan Alternatives." *Research and Dialogue on Programmatic Parties and Party Systems Case Study Reports* p. 96.

Klochko, Marianna A and Peter C Ordeshook. 2005. *Endogenous time preferences in social networks*. Edward Elgar Publishing.

Kruglanski, Arie W, Jocelyn J Bélanger, Xiaoyan Chen, Catalina Köpetz, Antonio Pierro and Lucia Mannetti. 2012. "The energetics of motivated cognition: a force-field analysis." *Psychological review* 119(1):1.

Lewis-Beck, Michael S and Martin Paldam. 2000. "Economic voting: an introduction." *Electoral studies* 19(2):113–121.

Lewis-Beck, Michael S and Mary Stegmaier. 2000. "Economic determinants of electoral outcomes." *Annual Review of Political Science* 3(1):183–219.

Li, JinZhen, Shu Li, WenZhong Wang, LiLin Rao and Huan Liu. 2011. "Are people always more risk averse after disasters? Surveys after a heavy snowhit and a major earthquake in China in 2008." *Applied cognitive psychology* 25(1):104–111.

Loewenstein, George, Daniel Read and Roy F Baumeister. 2003. *Time and Decision: Economic and Psychological Perspectives of Intertemporal Choice*. Russell Sage Foundation.

Loewenstein, George and Jon Elster. 1992. *Choice over time*. Russell Sage Foundation.

Lupia, Arthur. 2015. *Uninformed: Why people seem to know so little about politics and what we can do about it*. Oxford University Press.

MacKuen, Michael B, Robert S Erikson and James A Stimson. 1992. "Peasants or bankers? The American electorate and the US economy." *American Political Science Review* 86(03):597–611.

Magaloni, Beatriz. 2006. *Voting for autocracy: Hegemonic party survival and its demise in Mexico*. Cambridge University Press Cambridge.

Markus, Gregory B. 1988. "The impact of personal and national economic conditions on the presidential vote: A pooled cross-sectional analysis." *American Journal of Political Science* pp. 137–154.

McClure, Samuel M, David I Laibson, George Loewenstein and Jonathan D Cohen. 2004. "Separate neural systems value immediate and delayed monetary rewards." *Science* 306(5695):503–507.

McClure, Samuel M, Keith M Ericson, David I Laibson, George Loewenstein and Jonathan D Cohen. 2007. "Time discounting for primary rewards." *The Journal of Neuroscience* 27(21):5796–5804.

Metcalfe, Janet and Walter Mischel. 1999. "A hot/cool-system analysis of delay of gratification: dynamics of willpower." *Psychological review* 106(1):3.

Mill, John Stuart. 1861. "Considerations on representative government." *inCollected Works of John Stuart Mill, ed. RobsonJ. M.(Toronto: University of Toronto Press, 1977)* pp. 572–73.

Ostrom, Vincent. 1997. *The meaning of democracy and the vulnerability of democracies: A response to Tocqueville's challenge.* Cambridge Univ Press.

Parfit, Derek. 1984. *Reasons and Persons.* Oxford University Press.

Putnam, Robert D, Robert Leonardi and Raffaella Y Nanetti. 1994. *Making democracy work: Civic traditions in modern Italy.* Princeton university press.

Samuelson, Paul A. 1937. "A note on measurement of utility." *The Review of Economic Studies* 4(2):155–161.

Scott, James C. 1969. "Corruption, machine politics, and political change." *American political science review* 63(04):1142–1158.

Senior, N. W. 1836. *An Outline of the Science of Political Economy.* London: Clowes ad Sons.

Simon, Herbert A. 1995. "Rationality in political behavior." *Political psychology* pp. 45–61.

Steele, Whitney Randolph, George B Schreiber, Anne Guiltinan, Catharie Nass, Simone A Glynn, David J Wright, Debra Kessler, Karen S Schlumpf, Yongling Tu, James W Smith et al. 2008. "The role of altruistic behavior, empathetic concern, and social responsibility motivation in blood donation behavior." *Transfusion* 48(1):43–54.

Stokes, Susan C. 1996. "Public opinion and market reforms: the limits of economic voting." *Comparative political studies* 29(5):499–519.

Strathman, Alan, Faith Gleicher, David S Boninger and C Scott Edwards. 1994. "The consideration of future consequences: Weighing immediate and distant outcomes of behavior." *Journal of personality and social psychology* 66(4):742.

Taylor, Michael. 1976. *Anarchy and Co-operation.* London: Wiley.

Tufte, Edward R. 1980. *Political control of the economy.* Princeton University Press.

Vischer, Thomas, Thomas Dohmen, Armin Falk, David Huffman, Jürgen Schupp, Uwe Sunde and Gert G Wagner. 2013. "Validating an ultra-short survey measure of patience." *Economics Letters* 120(2):142–145.

Wang, Mei, Marc Oliver Rieger and Thorsten Hens. 2016. "How time preferences differ: Evidence from 53 countries." *Journal of Economic Psychology* 52:115–135.

Wilson, Rick K. 2011. "The contribution of behavioral economics to political science." *Annual Review of Political Science* 14:201–223.

Wlezien, Christopher. 2015. "The myopic voter? The economy and us presidential elections." *Electoral Studies* 39:195–204.

Zimbardo, Philip G, Kelli A Keough and John N Boyd. 1997. "Present time perspective as a predictor of risky driving." *Personality and Individual Differences* 23(6):1007–1023.

Zimbardo, Philip and John Boyd. 2008. *The time paradox: The new psychology of time that will change your life.* Simon and Schuster.