



# Lifecycle changes and the activation of habitual voting: The case of Costa Rica



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## ABSTRACT

Under circumstances of substantial turnout reductions, the development of electoral habits may constitute a key factor to attenuate or even revert such tendency in the long term. Using a unique dataset I examine the extent to which age and lifecycle changes mediate the effects of prior turnout (*habituation*) on future electoral behavior. Three findings are highlighted. First, age and turnout<sub>t-1</sub> reinforce each other and boost turnout to higher rates. Second, even under favorable circumstances, residential mobility still can disrupt individuals' voting patterns, regardless of whether their behavior was already habituated. Finally, habitual voting is activated by the time individuals participate in their fourth election, and the sooner they cast their first vote.

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## 1. Introduction

*Habits keep us doing what we have always done, despite our best intentions to act otherwise*

Neal et al., 2006

Under which circumstances habitual voting takes place? and if so, at what age, if any, voting in a previous elections triggers habituation? Why some people vote and others do not received an impressive amount of research attention and an expansive literature (Matsusaka and Palda, 1999; Tenn, 2007). In contrast to the field's two dominant approaches that stress on the individual characteristics that make voters more likely to cast their votes,<sup>1</sup> or those that emphasize on the institutional features that influence citizens' voting decisions,<sup>2</sup> some scholars argue that turnout is

better explained by persistence from one election to the next, which is *habitual voting*.<sup>3</sup> Plutzer (2002: 43) suggest that inertia is a condition that must be understood in order to properly understand the traditional “causes” of turnout. The logic underlying this assumption is that the reasons why voters cast their vote cannot be fully elucidated by rational factors or because voters respond to electoral stimulus (campaign or canvassing effects) but instead because voting becomes habitual through repetition.

Such persistence highlights the dynamic nature of political behavior. Participating in the first elections in which someone is entitled to do so leave a “footprint” in individuals' political behavior (Denny and Doyle, 2009). Briefly, previous turnout decisions influence subsequent

<sup>3</sup> One alternative theory postulates that individuals derive psychological benefits from casting a vote. Green and Shachar (2000) argue that turnout alters certain broad political orientations known to influence voter turnout, such as feelings of civic duty. It also “enhances the voters' interest in politics and increases their sense of civic duty, all of which strengthen the positive connotations associated with voting and generates positive thoughts which reinforces its continued behavior” (Denny and Doyle, 2009; Nickerson 2004). Even though it is salient to identify the differences between habituation and civic duty that goes beyond the goals of this paper.

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<sup>1</sup> See: Rosenstone and Hansen 1993; Brady et al., 1995; Bratton 1999; Finkel 1985; Gerber et al., 2008; Karp et al., Bowler 2007; Mondak et al., 2010; and Blattman 2009.

<sup>2</sup> In this case see: Perea 2002; Fornos et al., 2004; Pérez-Liñan 2001; Powell 1986; Gray and Caul 2000; McDonald and Popkin, 2001; Panagopoulos 2008; Steiner 2010; and Baek 2009.

ones. More concretely voting in one election increases voters' propensity to go to the polls in the future. Less attention has been given to examine a) the conditions under which habitual vote takes place and most importantly, b) what factors trigger electoral habits, and c) when habitual voting is activated.

A body of literature in political psychology characterizes "habits" in general as a result of repeated processes. Specifically, turnout becomes habitual through repetition and it is guided by an automatic cognitive process rather than by sophisticated decision making. Critics have questioned that frequent behavior does not necessarily mean that it is already habituated. An alternative explanation suggests that two conditions must be met for the development of habits: repeated responses and stable features of the context. Therefore, repetition is a necessary but an insufficient condition for developing a strong habit. Furthermore, contextual changes can disrupt habit performance. Unlike most other behaviors turnout is certainly not performed in fixed contexts (Aldrich et al., 2011).

I address two central research questions in this paper. First, does habituation take place, and if so, under what conditions? Second, is voting in a previous election a sufficient condition for the activation of habitual voting? In answering these questions I move beyond the hypothesis of a direct relationship between habitual voting and turnout, and I argue that in addition to that, this relationship involves conditional effects.

In this paper I develop a framework that explores the effects of changes through life and their impact on political participation. I hypothesize that the effects of prior voting on future voting (habit) are conditional on three factors: getting older, residential mobility and, the time someone cast a vote for first time. Age and relocation influence voting behavior in opposite directions. If voting is a reinforcing behavior the former must show a strong and positive effect on turnout, whereas the latter may (or may not) disturb habitual voting. Besides the direct effects, one can also examine the extent to which there are conditional effects of age and relocation on political participation. Hence, perhaps it is not only that previous vote alone influences current turnout, but rather that the relationship might also be influenced by lifecycle changes. There is abundant evidence in the field proving that turnout is lowest at the beginning of adult life, rises through middle age, and declines at old ages (Wolfinger and Rosenstone, 1980). Secondly, scholars claim that residential mobility has a deleterious impact on turnout. In addition, I argue that the effect of habituation increases depending on the time an individual cast his first vote. Higher or lower turnout is not a trivial issue in democratic systems. Traditionally, higher levels of political participation have been considered by experts as a sign of democratic stability, support for the political regime and confidence in political institutions.

Using Costa Rica as a case study I examine the conditions under what these trends occur. In doing so, this paper contributes to our understanding of the dynamics of voter turnout. In framing voting behavior as a dynamic process rather than a static one, this paper has two main purposes. First, I disentangle the age–turnout connection, investigating the effects of habituation in voting behavior. Second,

I analyze the conditions under which habituation takes place, using interaction effects between prior turnout, age, and first vote time.<sup>4</sup>

Costa Rica is a good case study to examine the dynamics of political turnout for several reasons. First, voter registration in the country is an automatic process and the country has a record of turnout of all 2.5 million (on average) individual voters. It is perhaps the only place that has this very unique dataset for the whole country. One can expect that, first, if habitual voting is conditioned by lifecycle changes, and second, if this prior voting–future turnout connection matters as scholars have said, one must find evidence in the oldest and most stable democracy in Latin America where there is a long tradition of free and fair electoral contests since mid-1950s.

In sum, based on what is known about electoral behavior I explore under what conditions changes through life may influence the formation of turnout habits and activate (or reduce) its likelihood significantly. There are three main findings in this document. First, the empirical evidence confirms the conventional view of the age–turnout connection. In other words, when assessed in conjunction age and habit reinforce each other and boost turnout to higher rates. Second, the results show that even under favorable circumstances that facilitate the conditions under what voters cast their vote, residential mobility still can disrupt individuals' voting behavior regardless of the fact that their behavior was already habituated. Finally, habitual voting is activated by the time individuals participate in their fourth election, or what is the same when they are 30 years old, and the sooner they cast their first vote.

This document is divided in five sections including this introduction. In the second one I provide the theoretical framework for exploring the effects of changes through life and their impact on political participation. Section three is dedicated to data description. Then, in section four I analyze the empirical results based on multivariate analysis. Finally, in section five I discuss the conclusions.

## 2. Voting as habit approach

One compelling alternative turnout explanation is the *voting as habit* framework. According to Plutzer (2002) "there exists an ample consensus in the field that voting behavior is, in part, a gradually acquired habit". People learn the habit of voting, or not, based on experience in the first few elections where they were eligible to vote (Franklin et al., 2004). The logic behind this assumption is that a citizens' voting history is a powerful predictor of future behavior. Brody and Sniderman (1977) have reported that past voting behavior predicts current turnout, controlling for individual-level traits and psychological involvement in politics. Although we can find different terminologies in the literature to characterize habitual voting ("consuetude", "habit strength", "inertia", "casual

<sup>4</sup> Other scholars argue that one part of the age–turnout relationship is habitual; the other is related to the social basis of turnout. Even though I recognize that disentangling these two causal explanations in both theoretical and empirical terms is critical, here I chose to emphasize in the former due to data availability.

voting”, “circumstantial voter”), there is a long standing agreement that voting behavior is habitual (Plutzer, 2002).<sup>5</sup>

Concretely, casting a ballot in one election increases the voters' propensity to go to the polls in the future. Simply put, “if two individuals have exactly the same characteristics, but one decides to vote and the other does not, then these decisions will affect their probability of voting in future elections” (Denny and Doyle, 2009).

The conventional view in the literature is that voting goes up when young people take on adult roles and when younger generations get older. The “adult role” argument claims that turnout is a function of age.<sup>6</sup>

By contrast, the habituation model claims that current turnout depends on prior voting behavior. It has long been hypothesized that habituation will contribute to turnout. Although this hypothesis is well-known, there is surprisingly less empirical evidence on the connection between prior turnout, lifecycle changes and future turnout.

In turn, my argument claims that previous voting behavior interacts with lifecycle changes. The key theoretical issue here is that age, residential mobility, and first time vote mediate the impact of prior voting on future voting (i.e. what I call *habituation*). In this section of the paper I discuss my hypotheses in sequence. First a hypothesis about the main effect, and then other hypotheses about the conditional effects.

As some scholars have stated succinctly “people are creatures of habit” (Danner et al., 2008). Without habits, “people would be guided by plans, consciously guide, and monitor every action” (Neal et al., 2006: 198). A well-developed theory in social psychology, with a large amount of empirical evidence, points toward a specific understanding of “habit” (Wood and Neal, 2007; Aldrich et al., 2011).<sup>7</sup> This theory considers the habit formation as the consequence of a repetitive process.<sup>8</sup> “Repetition of a behavior in a consistent context progressively activates an automatic response with which the behavior is performed when the situation is encountered” (Lally et al., 2010: 998).<sup>9</sup>

<sup>5</sup> According to Fowler (2006) sometimes people make it to the polls and sometimes they do not (casual voters), but hardly anyone in the model makes it a habit always to vote or always to stay home. This result is at odds with a substantial literature that indicates most people are habitual voters.

<sup>6</sup> Recently *Electoral Studies* published the results of a symposium on new approaches in age, period effects and cohort (see volume 33, 2014).

<sup>7</sup> Theories of automaticity developed in social psychology provide a sophisticated theoretical grounding to understand turnout as a habit. Responses given automatically are activated quickly in memory by associated cues, often without intention or deliberation (Aldrich et al., 2011).

<sup>8</sup> More plausibly, a behavior becomes as automatic as it can after some number of repetitions, and further repetition no longer increases automaticity. In addition, early repetitions could be expected to result in larger increases as the association between situation and action is created. For more details see: Danner et al. (2008).

<sup>9</sup> For Danner et al. (2008) people are able to perform goal directed behavior without forming an explicit intention because the behavior is directly mentally accessed in the context at hand as a result of frequently and consistently having performed that behavior in the past. In fact, Triandis (1980) hypothesized that when the same behavior is more frequently executed in the past and increases in habit strength, it is less guided by intention to perform that behavior. In this sense, habits are automatic to the extent that the behavior is no longer predicted (or guided) by intentions. The stronger the habit, the weaker the intention–behavior relationship.

In the behavioral tradition, habit has always been equated with behavioral frequency (Hull, 1943, 1951; Verplanken, 2006)<sup>10</sup>. In brief, “this theory suggests that habits are sets of automatic scripts executed in response to specific circumstances that are monitored by unconscious emotional subsystems for compatibility with goals” (Aldrich et al., 2011). In sum, when behavior is performed repeatedly and becomes habitual, it is guided by automated cognitive processes, rather than being preceded by elaborate decision processes (Aarts et al., 1998).<sup>11</sup> That said, the traditional hypothesis states that people who voted at the last election are more likely to vote in the next one.

This framework can readily explain why one of the standard socio-demographic determinants –age– is almost always found to have a positive effect of voter turnout. As habits become reinforcing over time older citizens have had the opportunity to cast their votes in more elections and developing habitual voting. This perspective is consistent with other turnout habits studies. As Plutzer (2002) has said, “voting is likely to bring positive reinforcement from friends, family, and co-workers. As voters age, their peer cohort has increasingly higher participation rates and they eventually move out of age-homogeneous settings (e.g., college residences) and into others (workplaces, community organizations) where the average levels of political knowledge and turnout are higher. Thus, as young citizens take on more adult roles, they are likely to be subject to more and more intense participation norms”.

In a similar manner that in the party identification attachment case (see: Shachar, 2003) older individuals are expected to exhibit stronger habitual voting than young voters. This assumption is based on the fact that having previously voted increases one's disposition towards it. This captures the idea that people's sense of voting builds over time. Older people have had the opportunity to participate in more elections and consequently to develop a habit. Younger citizens have not yet developed a habit of voting whereas the middle aged and elderly have (Gimpel et al., 2004; Plutzer, 2002). Similarly, the lifecycle explanation says that as young people become older they get more experienced in the electoral and political process. The reason for this effect is that young people lack the resources that older people have accumulated through life (Quintelier, 2007).

In this paper I examine the age–turnout interaction in the following traditional testable hypothesis:

**H1.** *The effect of prior voting on future voting (habituation) increases with age.*

<sup>10</sup> Hull's early work (1943, 1951) suggested that the relationship between repetition and habit strength follows an asymptotic curve in which automaticity increases steadily – but by a smaller amount with each repetition – until it reaches an asymptote (plateau).

<sup>11</sup> For Aarts et al. (1998) when the same decision has been made over and over again in the past under similar circumstances in order to attain a certain goal, one does not need to assess one's attitudes and behavioral control and to formulate a conscious intention at the time one has to act. Situational cues activate highly accessible mental structures of the behavior that subsequently guide the immediate initiation of the behavior.

In contrast, other scholars define habits as cognitive associations between repeated responses and stable features of the context.<sup>12</sup> Habits develop by satisfactorily repeating behavior in stable contexts (Wood et al., 2002). Given that the context remains stable and the response is satisfactory, these associations then acquire a degree of automaticity (Verplanken, 2006). Habits are formed “when using the same behavior frequently and consistently in a similar context for the same purpose” (Danner et al., 2008: 261).

Psychological studies based on the theory of habit automaticity find that contextual features have a causal role in triggering habit performance. In this theory, “context” is defined as the set of preceding actions, cues, events, and people that are associated with regular repetition of the action. In particular, habit performance is readily disrupted by changes in performance contexts (Aldrich et al., 2011; Wood et al., 2005).

Accordingly, the key factor for habit behavior is, therefore, a stable stimulus context to occur, and habit has indeed been defined as the tendency to repeat past behavior in a stable context. Alternately, “when behaviors are not well learned or when they are performed in unstable or difficult contexts, conscious decision making is likely to be necessary to initiate and carry out the behavior” (Ouellette and Wood, 1998: 56).

In the field of political behavior numerous contributions have argued that voting is habitual. As scholars<sup>13</sup> have said, in the specific case of turnout, “everyone necessarily starts off with no strength of habit for turnout at all. Turnout, like any other response, becomes automated through behavioral repetition. Repetition is, however, insufficient to develop a strong habit. A habit forms from repetition of a response in the same, or very similar, context” (Aldrich et al., 2011). Consistency basically refers to the stability of the context in which the behavior has been executed in the past.

Thus, the fact that people are sensitive to changes in this context allows me to understand the importance of the context for habits to emerge. Under that circumstances, “the context becomes strongly and exclusively linked to the mental representation of the behavior and hence, the context is capable of eliciting the performance of the behavior directly without conscious intent” (Danner et al., 2008). In fact, acknowledging that context plays a role in the establishment of habits scholars have proposed (Ouellette and Wood, 1998; Wood et al., 2005) that any measure of habit should reflect the extent to which behavior is performed both frequently and in a stable context.

<sup>12</sup> Others have explored the extent to what habits are driven by goals. More concretely, goals can (a) direct habits by motivating repetition that leads to habit formation and by promoting exposure to cues that trigger habits, (b) be inferred from habits, and (c) interact with habits in ways that preserve the learned habit associations (for more details see Wood and Neal, 2007).

<sup>13</sup> In particular, they explore empirically whether turnout reflects two styles of decision making. Some people decide to turnout as it is usually understood, as the result of deliberation or conscious weighing of relevant factors. Other citizens determine whether to vote as the result of what is understood theoretically in social psychology as habituated responses, responding automatically to quite different sorts of cues (Aldrich et al., 2011).

The main difference between turnout and other many behaviors is, however, that “the context is not fixed, and so we must consider not only the repetition of that behavior but also whether those repetitions are made in similar contexts” (Aldrich et al., 2011). For others scholars “when usual contexts for performance change, habits cannot be cued by recurring stimuli, and performance should be disrupted. Habits survive only when aspects of the performance context did not change. This means that habits emerge when performed in particular locations, at specific times, in particular moods, and with or without certain interaction partners”. Briefly, habits are context dependent (Wood et al., 2005: 918).

This assumption implies that the alteration of the context, via different sources, is going to interrupt the habit cycle. In other words, structural changes in individuals' life cycle might have the capacity to disrupt the context in which turnout habit occur. However, only some changes in circumstances should yield change in habitual behavior (Wood et al., 2005).

Scholars have attributed to residential mobility deleterious effects regarding political participation but for different reasons. According to Highton and Wolfinger (2001) “there is no question that people of any age who change residence are less likely to vote”. Squire et al. (1987) find “that turnout in the United States would increase by nine percentage points if the effect of moving were removed”. Scholars claim that the consequent need to re-register rather than any disruption of social ties (Highton, 2000). Others argue, in contrast, that “residential mobility is associated with lower turnout due to the fact that such people may have less attachment to their new community” (Denny and Doyle, 2009). In sum, the literature suggests that residential stability facilitates turnout habits.

Mobility in Costa Rica is not a key factor in terms of political participation as in the U.S. or other societies. In spite of the fact that mobility has a strong negative correlation with political participation there are important differences. First, the country is considerable smaller than other nations. Thus, the typical reasons why people move (new job or college attendance) do not necessarily imply that they have to abandon their current community and adopt a new one. Hence, for some individuals the cost of moving is higher and they prefer to commute relative longer distances for going to school or job and going back home later at the end of the day.

Second, although people move for different reasons in Costa Rica, moving to a new place does not necessarily increase the costs of voting for a simple reason: voters can maintain their old electoral residence regardless of where they are living now. Actually, movers do not always update their address just for electoral reasons. A cultural tradition of going to the polls all together may account for this. On Electoral Day, family members meet in their electoral district, go to their poll station as a group, and cast their vote for their preferred candidate or party. These traditions disincentives individuals to change their electoral residence irrespectively of how many kilometers they have to travel and vote.

The combination of these three aspects may lead someone to simply underestimate the influence of

residential mobility on habitual voting. Actually, it seems that under the conditions just mentioned, residential changes effects would be marginal or even innocuous in explaining voting habits. However, I theorize that despite the confluence of the factors present in the Costa Rican case residential instability has deleterious effects on turnout. Shortly, in this document I demonstrate that even in contexts with fewer barriers affecting electoral participation, mobility still has a negative effect on turnout rates.

The traditional view in the political behavior field has ignored the possibility the extent to what residential mobility indirectly affect turnout. Aldrich et al. (2011) argue with respect to voting, that the performance context is particularly deeply disrupted when people move to a new location. “As with all context disruptions, the features of context that cued habitual voting in the old location are broken and need to be reestablished in the new location before a strong habit for turnout can be reestablished. Put another way, those who have just moved cannot be turning out due to a habitual response. Those who have not moved might be turning out due to recurring cues that activated the habitual response”.<sup>14</sup>

For Plutzer (2002) residential mobility may temporarily disrupt habitual voters' regular pattern. Like other disruptive factors, “residential mobility is primarily a factor affecting habitual voters”. In other words, under favorable circumstances that anticipate a marginal effect of relocation on turnout, residential mobility still has a negative impact on political participation via indirect effects. Concretely, the conditional hypothesis in this case says that:

**H2.** *The effect of prior voting on future voting (habit) will decrease when people relocate.*

The vast majority of the studies of habitual voting have been conducted in industrialized democracies raising doubts about the universality of this theoretical approach. Here I examine whether a similar framework could be applicable in another democratic regime.

In sum, here I lay out a theory for why the effects of prior voting on future turnout are mediated by lifecycle changes, independently of the direct effect of those changes on the probability of voting.<sup>15</sup> If my theory is right, the likelihood that an individual will vote is not merely a behavioral manifestation of age-turnout connection. It might also reflect the influence of other factors such as prior behavior and the time individuals cast their first vote. In fact, I suggest that empirical evidence of a central role of these two factors in the activation of habitual voting will provide the

basis for a different interpretation of the dynamics of turnout itself.

### 3. Data description

The use of actual voting turnout avoids the problems of the inflated rate of reported turnout which characterizes all survey data (Monroe, 1977). Individual-level panel data in this paper includes the *actual voting behavior* (participation or not) for the *universe of voters* in four of the most recent presidential elections in Costa Rica (1994–2006). To the best of my knowledge only Costa Rica makes this unique database available for the entire voting population. These data allow me to fully explore age and habit effects on voter turnout, and mainly the conditions under which habitual voting takes place.

The data for the analysis are based on the official turnout database collected by the Electoral Supreme Court (*Tribunal Supremo de Elecciones, TSE*) after each national election. Data were merged by a research team in the *Social Research Institute* at the *University of Costa Rica*. The author of this paper got access to the dataset because he belongs to the group of researchers that are currently working on analyzing electoral behavior and political culture using this and other survey results.

As soon as voters turn 18 years old they appear in the list of eligible voters. Because voter registration is a necessary condition for turnout, automatic registration removes from the analysis the problem of conflating two different types of behavior: the decision to register and the decision to vote. Furthermore, the use of official records of voter participation at the individual level allows me to study the full population of voting age, including those voters who have never participated in any election. Automatic registration also means that I eliminate desirability bias related to voluntary registration because I examine the universe of potential voters.<sup>16</sup>

In addition to that, all the voters in the dataset but perhaps the very old ones, were born and grew up under democracy. It means that they have lived under a democratic regime all the time. This condition is clearly absent in any other place in Latin America due to the “bouncing” democratization pattern that has prevailed in the region. Therefore, all voters in this study have been exposed to the same stimuli (democracy), a peculiar condition that allows me to discard, in this study, the short-term effect of regime change on turnout.

This is a panel of the universe of individuals entitled to vote in Costa Rica in four of the most recent presidential elections 1994, 1998, 2002, and 2006. This dataset is an exceptionally rich source of voting behavior. It includes approximately around 2 million observations for each

<sup>14</sup> For these authors once a voter does move, the context is necessarily sufficiently disrupted that any existing habit is no longer employable, and the voter cannot be deciding to turnout based on contextual cues that stimulate a habit. The requirement to consciously consider the process of voting necessarily returns turnout to a conscious, deliberate, and non-habitual response.

<sup>15</sup> Because my theory emphasizes on the interactive effects of prior turnout, age and mobility on future turnout I do not have hypotheses on the constitutive terms (main effects of age and mobility). That is, what is the expected effect of age and mobility for those who did not vote in the prior election.

<sup>16</sup> According to Wolfinger and Rosenstone (1980) registration raises the cost of voting. Citizens must first perform a separate task that lacks the immediate gratification characterizing other forms of political expression (such as voting). Registration is usually more difficult than voting, often involving more obscure information and a longer journey at a less convenient time, to complete a more complicated procedure. Moreover, it must usually be done before interest in the campaign has reached its peak.

electoral contest and 8.7 million observations in total. Panel dataset includes 5.8 million cases due to issues such as voter's mortality or the natural incorporation of young eligible ones.<sup>17</sup> There are no missing data in the dependent variables across all cases. Some of the standard individual level variables (sex, age, and residence) are in the dataset. The unit of analysis is voters in four different electoral contests and twelve years in total.

Also, two important political changes occurred during the historical period covered by this study: turnout levels decreased and the political party system evolved from two-party to multi-party. First, after a tradition of high electoral participation, with averages around 75% between 1962 and 1998, turnout has decreased significantly in the last decade (1998–2010). In 2006 national election, turnout fell to an historic low: 65% of the electorate voting (Ramírez, 2010; Raventos et al., 2005). Second, a long tradition of low political fragmentation, which had led scholars to consider the probability of multiparty system unlikely to happen, was broken in 2002 with the first presidential run-off election in history due to the high dispersion of votes among parties (Alfaro, 2006; Raventos, 2008).

### 3.1. Dependent variable

The dependent variable is *voter turnout* in the 1998, 2002 and 2006 national elections. Voters that cast their vote were coded as 1, and 0 otherwise. Because I use the objective measure of political participation and the universe of voters, that is a balanced panel, I can get rid of concerns regarding dropout rates causing attrition bias (typically in panel data) or inflated measures that suggest that turnout may be overstated (survey cases). In other words, my turnout rates are neither above nor below the national aggregate turnout rate, they are the official ones.

### 3.2. Independent variables

In this section I describe the operationalization of my independent variables.

*Turnout*<sub>*t*-1</sub>: for measuring habitual voting I lagged the dependent variable – turnout (*t* – 1), so I lose the first observation to have the lag. This would leave me with three waves of political participation 1998, 2002 and 2006, for examining the extent to what voting habit is developed.

*Female* is a dichotomous variable. Men were coded as 0 and women as 1. In the Costa Rican case, since 1994 presidential election women cast their votes at higher rates than men (For more details see: Raventos et al., 2005).

*Age* is a continuous predictor that indicates voters' age at each election year (1994, 1998, 2002, and 2006). Data for this indicator are available at the official register office.

*Age squared*, this variable accounts for non-linear effects of age on turnout. In this case I would expect to find a negative coefficient. As one gets older, the likelihood of voting increases through late middle-age, and then

declines as one becomes more elderly. In this case the effect of age on turnout is positive up to a certain point, then it would become negative.

*Moved*: I also examine the effect of residential mobility on turnout. In the literature the typical assumption is that residential changes disrupts political behavior and increases the costs of voting. I use a binary variable to study mobility effects. Voters who moved (change in real address and updated it with the electoral tribunal) between elections (by the time of the *t* + 1 election) were coded as 1, and 0 otherwise.

### 3.3. Age-turnout variables (control predictors)

The following set of variables account for alternative explanations of the effects of prior behavior on future turnout:

#### 3.3.1. Cohort groups

The generational assumption contends that differences across age groups are artifacts of the socializing experiences of each generation. Cohorts share unique experiences that determine their orientation toward politics. According to this approach, the experiences of the first years in politics permanently shape the orientations of that generation. People who come of age at critical turning points that define political loyalties participate more in electoral politics than people who reach maturity in more ordinary times (Rosenstone and Hansen, 1993). Based on these theoretical assumptions I have identified four cohorts using dummy variables:

#### 3.3.2. Cohort 1

Voters who were eligible to vote in 1940 and after. This decade has been considered as a turning point in Costa Rican politics. During this decade several social reforms were approved and then incorporated into the Constitution of 1949. Social and political conflicts between old and new elites yield to a short episode of civil war in 1948. The political actors involved framed the conflict in terms of universal suffrage defense. Therefore, I expect to find a strong habitual voting among these citizens.

#### 3.3.3. Cohort 2

Voters who were entitled to vote in 1960 and after. The 1960s and 1970s have been depicted as the decades of growing and expansion of the State, consequently, one can expect that the attachment of this group with public agencies should be stronger as well as their participation rates.

#### 3.3.4. Cohort 3

Voters who were eligible to vote in 1978 and after. During the 1980s this cohort was exposed to two main events with two different implications in terms of political participation. First, the poor performance of the economies in Latin America, during what has been considered as the “lost decade”, creates incentives to abstain and punish incumbents. In spite of that, turnout rates remained high during that time. Second, civil conflicts in Central America influence the way in which individuals' value elections and

<sup>17</sup> Absentee balloting is not available in Costa Rica and those voters living abroad were not able to cast their vote until the 2014 presidential election.

political participation in the country. In addition to these two events, the crystallization of the two-party system in the early 1980s increases the likelihood of partisanship vote. Thus, members of this cohort would exhibit a weaker turnout habit than those in cohort 1 and 2 but still a significant portion of them have developed the habit of voting.

### 3.3.5. Cohort 4 (baseline category in the models)

Voters who were entitled to vote in 1994 and after. By the time the members of this cohort were eligible to vote the loyalties and political linkages originated in the 1940s have almost vanished entirely. More broadly, this cohort coincides with the third wave of democratization across Latin America. The changes in the political party system in Costa Rica have influenced their participation patterns. More concretely, 1994 and 1998 national elections were the last two contests under two-party system context. The multi-party system that has emerged after that is less structured and more fluid by the time they face their first electoral experience. This last group is hypothesized to show two remarkably participation trends than pervious cohorts. First, they should have the weakest turnout habits across the four identified generations. Second, a significant number of them may never develop voting habits due to fragile party attachments and the high volatile of the political preferences when they enter to the electorate.

### 3.3.6. Period effects

Because every election is influenced by certain circumstances that affect all people alike, regardless of their age or birth cohort, in this paper I test the idea that the presidential election of 1998, in which there was a significant decrease in turnout rates for the first time since 1958. In order to measure *period effects*, I include a dummy variable for the 1998 national election.

### 3.3.7. First turnout

The dynamic approach I applied here postulates that individuals develop the habit of voting not only due to age changes but also as a result of the time they decided to cast their vote for first time. Voters who participate in the first elections they were entitled to do so would activate habits earlier than those who did not show up in the polls.

*First turnout* is a continuous predictor that measures the number of years since an individual cast his vote for first time. Thus, if someone voted for first time in 1994 *First turnout* is: 2006–1994 = 12 years. *First turnout* values can be 4, 8 or 12 years. This predictor was used in the estimation of habitual voting models (see below for model specification) for the subpopulation of voters entering to the electorate in 1994, 1998, and 2002.

## 3.4. Interactive predictors

Because my core assumption is that habitual voting effects are conditioned by contextual changes I use the following interaction terms to test this argument:

- $Turnout_{t-1} * age$
- $Turnout_{t-1} * moved$
- $Turnout_{t-1} * first\ turnout$

In sum, my models' specification are the following:

### 3.4.1. Turnout models

$$\begin{aligned} \Pr(turnout_{it} = 1 | X_{it}) &= \beta_1 + \beta_2 turnout_{it-1} + \beta_3 female_{it} + \beta_4 age_{it} \\ &+ \beta_5 age^2_{it} + \beta_6 moved_{it} \\ &+ \beta_7 turnout_{it-1} * age_{it} \\ &+ \beta_8 turnout_{it-1} * moved_{it} \end{aligned}$$

### 3.4.2. Habitual voting models

$$\begin{aligned} \Pr(turnout_{it} = 1 | X_{it}) &= \beta_1 + \beta_2 turnout_{it-1} + \beta_3 female_{it} + \beta_4 age_{it} \\ &+ \beta_5 age^2_{it} + \beta_6 moved_{it} + \beta_7 first\ turnout \\ &+ \beta_8 turnout_{it-1} * age_{it} \\ &+ \beta_9 turnout_{it-1} * moved_{it} \\ &+ \beta_{10} turnout_{it-1} * first\ turnout \end{aligned}$$

## 4. Multivariate analysis

In this paper I use a lagged dependent (dichotomous) variable model. This model assumes that  $Y$  at time  $t$  is a function of  $Y_{t-1}$  along with the other  $X_s$ . There are two main reasons why. First, I argue that the distributed lag effects of  $X$  that are captured in an  $Y_{t-1}$  effect and second, for partial control for omitted changing variables. This method is a very common way of modeling temporal dependence in longitudinal analyses. It has been called *State Dependence Model* since the current value of  $Y$  depends on its prior state, and future states of  $Y$  depend on current ones. Due to the big  $N$  I use PittGrid service to estimate the results.<sup>18</sup>

The application of these models has been criticized for introducing endogeneity bias in the estimates of the effects of  $(Y_{it-1})$  and by extension, the other independent variables. The presence of the lagged dependent variable  $Y_{t-1}$  has induced an intrinsic correlation between the independent variables and the equation's composite error term  $(U_i + \epsilon_{it})$ . This means that we cannot estimate  $\beta_1$  without bias. Basically,  $Y_{it-1}$  is a direct function of  $U_i$ . So, one of the independent variables  $(Y_{it-1})$  is intrinsically related to the error term of that equation. This introduces endogeneity bias in estimates of the effects of  $(Y_{it-1})$  and by extension, the other independent variables. There are some alternatives to solve this endogeneity problem, however, some problems may arise such as identifying a good instrument or even losing waves of data. In sum, despite some estimation problems I decided to stick with the lagged

<sup>18</sup> This research was supported in part by Computational Resources on PittGrid ([www.pittgrid.pitt.edu](http://www.pittgrid.pitt.edu)).

dependent (dichotomous) variable model estimated using random effects.

Table 1 reports the results of regressing turnout on different sets of variables. Model 1 is the additive version of the analysis that includes the main effects predictors: prior turnout, age, and residential mobility. In contrast, Model 2 is the non-additive one. It includes two interactions for examining under what circumstances age and residential mobility mediate the effect of prior turnout on political participation.

In testing the conditional effects of lifecycle changes on habitual voting the key variables of interest are the interactions between  $turnout_{t-1}$  and age, and  $turnout_{t-1}$  and mobility. A visual inspection of the results provides evidence to corroborate the initial expectations. First, in the additive model, prior turnout<sup>19</sup> and age are positively related to turnout. Also, women are more likely to vote than men. In contrast residential mobility is negatively associated with turnout.

Second, in the non-additive I interact  $turnout_{t-1}$  with both age and residential mobility. In the first case I argue that the increase in age will boost the impact of prior turnout. Conversely, in the second case I argue the opposite: that prior turnout and mobility undermine each other, such that increases in one variable contribute less to the net benefit of voting when the other is high than when it is low (Kam and Franzese, 2007). As we can see in Table 1 the effect of both interactions are significant and most importantly in the expected direction. Also, interestingly, in this case, the effect of mobility on turnout is positive suggesting that, contrary to the conventional wisdom, relocation can upset the inertia of non-voting<sup>20</sup>.

For interpreting the substantive effects and practice significance of the covariates in my models, I estimate predicted probabilities that  $Y = 1$  using marginal effects based on the interactive model holding dichotomous variables at zero and age at different values. According to the results, as expected, the effect of prior voting on future voting (habituation) is greater among older voters than young ones.

Concretely, if we examine two young individuals both at 25 years old, one that voted in the previous election, one that did not vote, the marginal effect of voting in the next election for those who did so previously would be 0.40 higher. Similarly, if we look at two voters both at 65 years old with the same conditions: one that showed up at the polls in the previous election, one that failed to show up, the prediction of voting in the next election again for those who did so previously would be 0.52 greater (Fig. 1). In

<sup>19</sup> The analysis in this paper considered only the conditions under which habitual voting takes place in national elections. This does not exclude the possibility that voters exhibit the same behavioral pattern at different electoral levels. As suggested by one of the reviewers this is relevant in the Costa Rican case due to the fact that municipal elections are not concurrent with the presidential and legislative electoral contests. The dataset I use in this paper would allow me to address this salient issue in the near future.

<sup>20</sup> This finding provides some evidence to explore to what extent non-voters can be said to have been in a state of “repetitive” behavior. However, this issue is beyond the goal of this paper.

**Table 1**  
Turnout models.

	Additive b/se	Interactive b/se
Female	0.209 (0.002)	0.215 (0.002)
Turnout <sub>(t-1)</sub>	1.840 (0.002)	1.283 (0.006)
Age	0.046 (0.001)	0.032 (0.001)
Age2	-0.000 (0.000)	-0.000 (0.000)
Moved	-0.034 (0.003)	0.330 (0.004)
Period effect (1998)	-0.130 (0.002)	-0.131 (0.002)
Cohort 1	0.235 (0.007)	0.265 (0.007)
Cohort 2	0.064 (0.006)	0.110 (0.006)
Cohort 3	0.012 (0.004)	0.042 (0.004)
Turnout <sub>(t-1)</sub> × age		0.017 (0.000)
Turnout <sub>(t-1)</sub> × moved		-0.655 (0.005)
Constant	-1.533 (0.013)	-1.114 (0.014)
Wald Chi-squared	874,459	904,573
p	0.000	0.000
Number of cases	5787,701	578,7701

All coefficients are statistically significant at 0.001 level.

sum, the evidence corroborates that the marginal effects of  $turnout_{t-1}$  on turnout increases with age, supporting H1.

In addition, as hypothesized the effect of prior voting on future voting decreases when people relocate. Specifically, among individuals who moved but did not vote in the previous election the conditional margin effect of voting again would be 0.08 greater whereas for those who relocate between elections and voted in the prior election the conditional effect of voting in the next election is 0.05 lower. Thus, data not only confirm the disruptive effects of residential mobility but also provide support to H2 that suggests that relocation affect voters differently depending on whether they have voted previously (Fig. 2).

Although the evidence provided here support that habitual voting increases with age as well as the disruptive effects of residential mobility on the other, both findings can be artifacts of the previous turnout measure I use. Accordingly, this possibility raises a serious methodological concern: the lagged value of turnout might capture all sorts of unobserved factors that are constant over time.<sup>21</sup> If this is the case, there are different ways one can address this issue. One way I explore here is analyzing those individuals that were eligible to vote for first time in 1994 (the first time point in the dataset) and after.<sup>22</sup> The use of this subpopulation, as a robustness test, allows me to study first, the behavior of individuals that have never voted before and second, disentangle two effects traditionally seen as the same thing: the effect of age on turnout and the development of habituation. Put another way, by using a subpopulation of voters that entered to electoral politics at the same time I test the assumption that voting in previous elections is a necessary but insufficient condition for developing the habit of voting. I argue that the activation of habitual voting will occur by the time individuals

<sup>21</sup> This issue was raised by one of the reviewers in the review process.

<sup>22</sup> For the purpose of this analysis I considered only voters that were able to vote for the first time in the following elections: 1994, 1998 y 2002. Thus, individuals who were eligible to vote for first time in 2006 and 2010 were excluded.

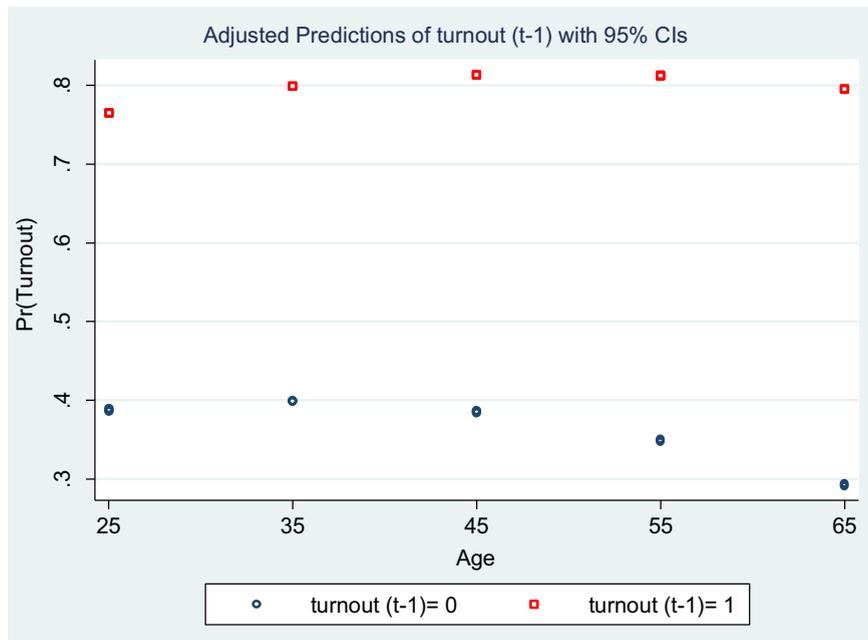


Fig. 1. Marginal effects of  $turnout_{(t-1)}$  on turnout at different ages.

participate in their fourth election and the sooner they cast their first vote.

In modeling habituation in a population that entered to electoral politics at the same time my expectation is that in addition to confirm that as individuals get older habitual voting would exhibit stronger effects on turnout, I can also estimate with precision the age in which casting a vote in a previous election triggers the development of habitual voting in the future.

Table 2 models include two additional predictors. The first one is the number of years since an individual cast her vote for the first time -*First turnout*- and the second one is the interaction  $turnout_{(t-1)} * First\ turnout$ . This last predictor is what I called the *trigger factor of the habituation*. If my theoretical assumption is right, this key predictor should be positively and significantly related to turnout, demonstrating that voting in previous elections activates the habituation component of turnout.

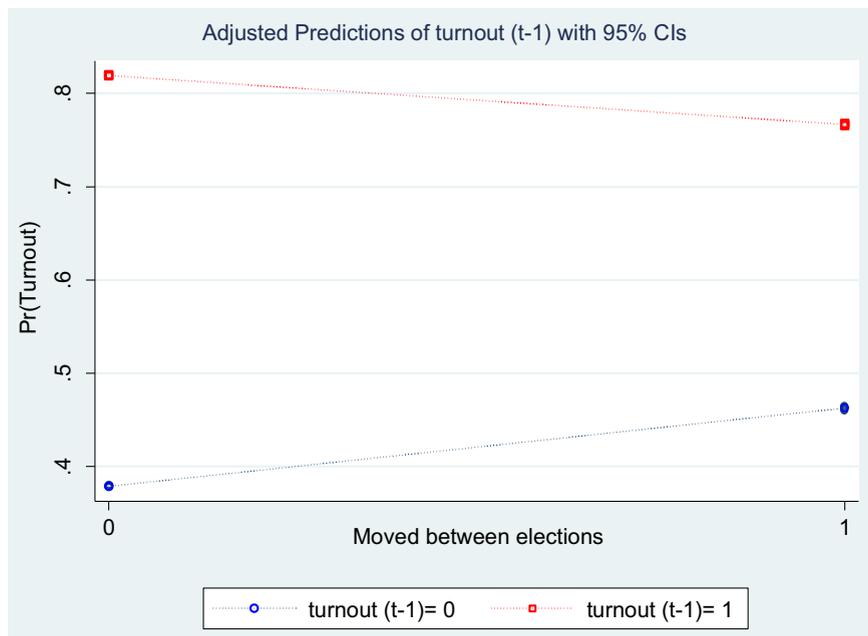


Fig. 2. Marginal effects of mobility on  $turnout_{(t-1)}$  and turnout.

**Table 2**  
Habitual voting models.

	Additive b/se	Interactive b/se
Female	0.180 (0.006)	0.172 (0.006)
Turnout <sub>(t-1)</sub>	-0.884 (0.006)	-7.843 (0.062)
Age	-0.178 (0.015)	-0.632 (0.017)
Age2	0.001 (0.000)	0.007 (0.000)
Moved	0.043 (0.007)	0.225 (0.011)
First turnout	0.158 (0.001)	0.038 (0.002)
Turnout <sub>(t-1)</sub> × Age		0.195 (0.003)
Turnout <sub>(t-1)</sub> × Moved		-0.345 (0.015)
Turnout <sub>(t-1)</sub> × First turnout		0.204 (0.002)
Constant	2.887 (0.205)	11.618 (0.238)
Wald Chi-Squared	60626	100257
p	0.000	0.000
Number of cases	567902	567902

As we can see in Table 2, the effect of turnout<sub>(t-1)</sub> on turnout is negative and statistically significant.<sup>23</sup> This seems to contradict my original causal story, however in this section I discuss three reasons why it is that way. First, this coefficient has no real meaning and it is not possible to interpret it due to the fact that it appears in the models interacted with other independent predictors. Second, both predictors, *First turnout* and its interaction with turnout<sub>(t-1)</sub> are positive and significantly associated with turnout, meaning that the higher the number of years since someone has voted and if someone has voted in the previous election, the higher the likelihood of turnout in the future. Third, this negative coefficient provides evidence that during the first elections someone is eligible to vote individuals' exhibit an exploratory behavior that I may call “bouncing” turnout: they may vote in the first election, abstain in the second one and vote again in the third one. After this phase the activation of habitual voting occurs and the stabilization of the voting behavior has already started (Table 3).

For interpreting the substantive effects and significance of the covariates in my models including these trends I just mentioned, I did two things. First, I estimate the coefficients of the conditional effects using the main predictors in the model at different values of age and the number of years since first vote. Interestingly, in the first case data reveal that in both cases, for individuals 22 years old that cast his first vote (the first time they were eligible to vote) four years before and voters 26 years old that voted first time 8 years before, voting at  $t-1$  decreases the likelihood of turnout in comparison to someone that did not vote before. Thus, voting at  $t-1$  inhibit rather than activate habituation. This story is different for an individual 30 years old that voted first time when they were 18 years old. In this case, by the time they are 30 years old voting in a previous election triggers the habituation aspect of turnout.<sup>24</sup>

<sup>23</sup> The other predictors exhibit the same direction and similar magnitudes if we contrast them with models in Table 1.

<sup>24</sup> This effect can also be interpreted as a regression to the mean or a “compensation effect” meaning that even if all new voters show up in the first election they are eligible to vote (something unlikely) the conditional effect in the second election is still negative. By the time they have the opportunity to vote in the fourth election this effect turns to a positive one.

The second procedure I did was to estimate predicted probabilities for  $Y = 1$  among individuals in the third election they were eligible to vote using marginal effects based on the habitual voting interactive model holding dichotomous variables at zero, age and first turnout at different values, assuming they voted in the second election they were eligible to vote. Table 4 provides compelling evidence supporting the idea that the activation of habitual voting takes place by the time individuals participate in their fourth election and the more time has elapsed since they cast their first vote. It shows that the probability of an individual of voting at  $t + 2$  if he voted in both  $t + 1$  and  $t$  is 0.66 units higher for someone who is 30 years old than for someone who is 4 years younger if he voted in  $t + 1$  but did not vote at  $t$ . These findings are consistent with the literature that suggest that low turnout among the young is a time-based phenomenon that will vanish “as the young grow to adopt several “adult roles” and get more integrated into society” (Bhatti et al., 2012). This assumption is based on the idea that people's sense of voting builds over time. Older people have had the opportunity to participate in more elections and consequently to develop a habit.

## 5. Conclusions

Using Costa Rica as a case study I demonstrate that habitual voting effects increases with age, are disrupted by relocation and also that voting in previous elections is a necessary but an insufficient condition for developing *habituation*. A vast majority of the literature on electoral behavior highlights, on one hand, the individual characteristics that make voters more likely to cast their votes or those that, on the other, stresses the institutional features that influence citizens' voting decisions. Less attention has been giving to the dynamic dimension of turnout.

Overall, this study expands voting patterns literature disentangling two effects that are traditionally seen and modeled as the same thing. First the effects of age on turnout and second, the circumstances under which voting in previous elections activates individuals' habituation to cast their votes. Therefore, this paper contributes to elucidate the conditions that trigger or inhibit the habit of voting and allow us to understand why some individuals vote and others do not. Here I show that on contrary to the conventional view, voting at  $t - 1$  in the first elections someone is eligible to participate, inhibit rather than activate habituation. However, prior turnout combined with the sooner someone cast her first vote triggers electoral habits. The evidence provided in this study suggests that the activation of habitual voting occurs by the time a voter is 30 years old.

In terms of the real world implications of these findings I argue that, on one hand, the formation, development, and consolidation of habitual voting could be a crucial factor in re-activating political participation in those societies that have been experiencing a decline trend in turnout. Even in contexts of high citizens' involvement in politics, electoral habits could help to sustain and increase such tendency. Furthermore, if new generations of voters do not show up at the polls or postpone their first vote longer than the standard time, they would enter to politics at older ages

**Table 3**

Conditional effects coefficients.

Coefficient turnout <sub>(t-1)</sub>	Turnout <sub>(t-1)</sub> *age at different ages	Turnout <sub>(t-1)</sub> *first turnout at different years	Coefficient conditional effect
-7.84281	22 years: 4.2998472	Voted first time 4 years ago: 0.8173084	-2.73
-7.84281	26 years old: 5.0816376	Voted first time 8 years ago: 1.6346168	-1.13
-7.84281	30 years old: 5.863428	Voted first time 12 years ago: 2.4519252	0.47

**Table 4**Marginal effects of turnout<sub>(t-1)</sub> on turnout at different ages and voting patterns.

Age	Probability of voting	Condition
30	0.78	Probability of voting <sub>t+2</sub> if he voted int + 1 and t.
	0.64	Probability of voting <sub>t+2</sub> if he voted int + 1 but did not vote at t.
26	0.23	Probability of voting <sub>t+2</sub> if he voted int + 1 and t.
	0.12	Probability of voting <sub>t+2</sub> if he voted int + 1 but did not vote at t.

and may have less opportunities to influence political decisions and have not concrete experiences with the political world. The worst case scenario would be one in which this pattern could extend individuals' apathy toward politics during life time. On the other hand, building a theoretical framework and developing a methodological way not only how to disentangle the effect of age and habitual voting but also to model the conditions under which habituation takes place and the estimation of voters' age in which the activation of habits occur, constitute the main theoretical implications of this contribution.

Finally, if we want to understand the implications of turnout decline in democratic contexts, we first need to comprehend the conditions under which habitual voting takes place at the individual level. More research is needed to explore how other factors such as family and peer networks influence individuals' adoption of habits. Future research should examine whether the findings highlighted here hold in similar contexts and more concretely, in those places where the party system has been stable. Also, it is necessary to incorporate recent electoral contests in Costa Rica due to the fact that the erosion of political support of the traditional parties in the last decade raises the cost to voters but especially among the new ones.

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