

Information Effects Across the Globe:

Does Political Knowledge Matter,

and How Do We Know It?

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Declaration

I hereby declare that no parts of this dissertation have been accepted for any other degrees in any other institutions. This dissertation contains no materials previously written and/or published by another person, except where appropriate acknowledgment is made in the form of bibliographical reference.

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Abstract

The study of the various merits of citizens' political knowledge has a rich tradition in political science research, by virtue of its purported pivotal role in maintaining democratic accountability. How knowledge gains can influence politically relevant outcomes is a frequent question in the study of citizens' political behavior, and the answers vary considerably across political contexts and across studies. This thesis offers an in-depth investigation of the origins of this variation in electoral democracies spanning the globe. In doing so, it builds on insights from an eclectic range of research fields from survey methodology and measurement theory, to cognitive psychology and comparative politics.

First, I show that a selection of technical properties of questionnaire items can account for more than half the variation in the reliability of knowledge measurements. I demonstrate that this can drastically affect the ability of political knowledge to explain outcomes of interest for political scientists. However, I find that the perils of measurement error can be circumvented by modeling techniques previously proposed for estimating information effects on vote choice (Bartels, 1996; and Delli Carpini and Keeter, 1996). The outcome of interest is regressed on political knowledge, a set of demographic variables and all the possible interactions between knowledge and the other variables in the model. By subtracting the expected value of the outcome variable from the same statistic under conditions of maximum political knowledge for every respondent, a total effect of political knowledge can be estimated.

As it was previously suggested that most of the effect of knowledge on political preferences occurs via indirect causal pathways (Zaller, 1992), interactive models are expected to better approximate the true effects of knowledge, compared to models that only estimate a direct effect. This claim, however, has not been tested prior to this dissertation. The empirical tests in the final substantive chapters of this thesis compare the two modeling approaches: the complex model with multiple

interaction terms and the simple model with only a direct effect of knowledge included.

In Chapter 4 I argue that the impact of knowledge on vote choice should be contingent upon the simplicity of the decision task (Lau et al., 2008). A meaningful decision in an election where there are few and easily distinguishable political alternatives does not require any amounts of expertise, thus information effects are expected to be weak. In Chapter 5, I argue that people develop positive attitudes towards the political system either by learning its virtues, or by having an affective attachment to their political community. In small, unitary countries, where there are few and easily distinguishable political parties, little knowledge is necessary for citizens to develop positive attitudes towards the system. I find more support for all these theories using the more complex interactive model, but the direct-effect model performs remarkably well in most cases.

This thesis offers ample evidence of information effects on political behaviors and attitudes in a wide range of electoral democracies across the globe. It corroborates findings previously reported in the literature, and demonstrates the ability of political institutions to mitigate information effects on vote choice, turnout, political efficacy and satisfaction with democracy. It also challenges the highly influential assertion that political knowledge has a primarily indirect effect on political preferences.

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CHAPTER 1: INTRODUCTION

The notion of representative democracy is predicated on the premise that the quality of political decisions hinges at least partially on some form of expertise or political sophistication on the side of the decision maker. A politician who knows the responsibilities of her mandate is generally preferred over one who does not, and for good reasons. Citizens are minimally expected to be capable of identifying political parties or candidates who are best able and willing to represent their political interests; this desideratum can be achieved by having a citizenry that is or acts as if it were knowledgeable of their own positions and those of political parties or candidates. The concept of political knowledge is of paramount relevance to any scholarly discussion on public opinion and political representation, which is attested by the vastness of the body of research on political knowledge and information effects in the political science literature.

Despite the considerable amount of scholarly interest in the effects of political knowledge on various political outcomes, there is no broad consensus regarding the expected size of such effects. As the extant cross-national literature can attest (Lau et al., 2008; Lau et al., 2014), the amount of variation from one election to the next is staggering, with political knowledge being deemed essentially irrelevant in some countries and extremely consequential in others. If we take such results at face value, their substantive implications should give us pause: the electorate does not need to follow politics at all in some countries,¹ whereas in other places citizens need to resume their democratic watchdog duties. There is merit to the notion that the importance of political knowledge is contingent upon factors spanning several levels of observation (individual, election, country, or even time), a notion that I also entertain throughout this thesis. However, there are conceptual and methodological considerations whose impact on the estimated effects of political knowledge need to be questioned lest

¹who the candidates are, what they stand for, what the incumbents did while in office, etc.

we put the cart before the proverbial horse.

Hence, an important part of this dissertation is dedicated to assessing the quality of political knowledge measurements with regard to reliability and validity, and estimating the impact of poor measurements on the outcome of hypothesis tests of information effects. Measurement reliability has a strong impact on the estimated relationship between political knowledge and its common covariates. As the analysis in this thesis shows, there are specific properties of the survey tools used for measuring knowledge that have dramatic consequences for reliability. While this finding serves as a promising starting point for future data collection efforts, it may appear to restrict our possibilities of testing hypotheses related to information effects on the noise-laden data at hand. Nevertheless, I find that this is not the case, as the perils of measurement error may in fact be circumvented by addressing the closely related issue of the conceptualization and operationalization of information effects.

This thesis pursues the rather ambitious goal of tackling stringent problems regarding the measurement of political knowledge and that of information effects while keeping a sharp focus on their substantive implications in the broader context of the comparative politics literature. This is achieved with an analysis that sheds light on the impact of institutional design on the magnitude of information effects across a large sample of election studies. For the first time, this dissertation provides an empirical assessment of a very influential conceptual and methodological claim in the literature on information effects: that the effects of political knowledge on vote choice are mostly indirect (Zaller, 1992: 23).

1.1. The premise

This dissertation works with the assumption that in any social system functioning according to rules that cannot be characterized as perfectly random, knowledge of the system should enhance one's

performance and rate of success. The terms specified in this axiom are key to understanding why political knowledge appears to be highly consequential in some people and some political contexts but less so in others. First, there is certainly no political community that functions without rules, or on rules that are random. However, the predictability of the outcomes produced by some institutional arrangements can be so low, that the average citizen would be compelled to conclude that political outcomes are de facto unconstrained by any stable rules. Knowledge is expected to be highly consequential in such settings. Conversely, other institutional arrangements may be so transparent that virtually everyone understands the patterns that govern political outcomes; knowledge is likely to be less consequential in such systems. Second, it is hardly apparent what it means for a citizen to have an “enhanced performance” or a better rate of success in her political transactions, as there is no objectively correct behavior or attitude to use as reference (Lau and Redlawsk, 2001). Throughout the dissertation, I consider a specific behavior, attitude or decision to be superior to its alternatives insofar as it agrees with a hypothetically fully informed version of it (Bartels, 1996; Delli Carpini and Keeter, 1996; Althaus, 1998; Toka, 2008; Dancey and Sheagley, 2013). Finally, “knowledge of the system” is by far the most contentious of the terms in the axiom above, yet it constitutes the central theme of the dissertation, thus a brief look at its meaning, relevance, and relation to other political science constructs is warranted.

1.2. The substantive argument

I argue that political literacy can hardly be characterized as a universal precondition for democratic citizenship. If political knowledge is to be viewed as instrumental (Downs, 1957), the amount of political knowledge that a citizen should have in order to live up to the standards of good citizenship must depend on the informational demands of the task she ought to perform. The quintessential task

that citizens perform in electoral democracies is voting in elections. I argue, following Lau and his associates (2008; 2014), that the difficulty of the decisional task varies across polities and across elections, and that much of the variation in difficulty can be attributed to institutional and country-level variables familiar to researchers in comparative politics. I hypothesize that political knowledge is more discriminating - thus, that information effects on vote choice are stronger - where there is a large number of political parties that compete centripetally, where coalition government is the norm and a list PR electoral system is in effect. In such polities, a high level of political knowledge is required in order to differentiate between the many competing parties not only because of the very similar programs on offer but also due to the difficulty in holding accountable political entities whose responsibilities are diffuse. These difficulties are exacerbated by the abstruse nature of party platforms, compared to the more personalistic appeal of candidate-centered elections. The harder it is to make a meaningful electoral decision, the greater the returns from political literacy.

As mentioned previously, cognitive heuristics and cues likely underlie part of the variation of information effects across individuals and across political environments. While many previous studies have discussed cues in the context of information effects on vote choice (Boudreau and Lupia, 2011), considerably less attention has been given to their role in the relationship between political knowledge and attitudes or behaviors other than the vote. This can be attributed to the fact that electoral decisions can be characterized as correct or incorrect (Lau and Redlawsk, 2001) based on their expected utility for the elector, whereas attitudes and behaviors are generally of a more subjective or affective nature. Nevertheless, previous literature on corruption (Mishler and Rose, 2001), effective government (Magalhães, 2014), economic evaluations and voting (Duch and Stevenson, 2010), economic performance and support for democracy (Clarke et al., 1993; Karp et al., 2003) suggest that people's feelings towards the system reflect to some degree their objective political reality. It appears sensible of a populace to hold their government in low regard if it is corrupt, ineffective and economically subpar.

Conversely, as the policies of democratic governments reflect the preferences of the electorate at least to some extent, it can be argued that it is sensible of citizens of consolidated democracies to have a strong sense of political efficacy and to view democracy positively in their country, perhaps even to express their support for the system by turning out to vote. I thus hypothesize that consolidated democracies will generate positive returns from political knowledge in political efficacy, satisfaction with democracy and electoral turnout. I theorize, however, that political knowledge is hardly the only path towards holding attitudes consonant with one's political reality; in fact, the effects of political knowledge are likely to be weaker in institutional environments that can engage people by affective means. Countries with PR electoral systems and multipartism can give people the symbolic reassurance that the government will not disregard their needs and interests, either by having them represented in the legislature or by making a credible promise of future representation for all niche political interests. Party system polarization can increase the subjective benefits from voting and make the stakes of political participation apparent even for the least informed citizens. Conversely, populous countries, bicameral parliaments and federalism are expected to have the opposite effect and alienate the uninformed by increasing bureaucracy, reducing the citizens' sense of community and increasing the distance between them and the political decisions they are subject to. Analogous to the mechanism by which cues streamline people's cognitive efforts in making electoral decisions, I argue that the institutions mentioned above attenuate or augment the effects of political knowledge on citizens' attitudes towards their polity.

1.3. Conceptual clarification: political knowledge

Political knowledge refers to the factual knowledge about politics stored in the conscious memory of citizens (Carpini and Keeter, 1996). As opposed to political attitudes or personal evaluations of things

political, political information concerns the degree to which the beliefs held by citizens conform to an objective or intersubjective political reality. For instance, it is objectively true that the president of France is directly elected by the French electorate, but no objective or intersubjective truth value can be attributed to the idea that immigration laws should be more or less restrictive. While the former can constitute an element of political knowledge, the latter is merely a matter of political attitudes.

The utility and the multiple roles of political knowledge are widely documented in the political science literature. It “assists citizens in discerning their individual and group interests” (Carpini and Keeter, 1996; Fournier, 2002) and contributes to aligning the preferences of citizens with their political behavior and vote decisions. More informed citizens are more likely to be aware of the political alternatives facing them (Fournier, 2002, Bartels, 2005; Sturgis and Smith, 2010) and to vote for parties and candidates who are politically closer to their personal political beliefs (Luskin, 1990; Fishkin, 1997; Fishkin and Luskin, 1999; Lau and Redlawsk, 2001; Lau et al., 2008). Even more importantly from a normative democratic point of view, political knowledge is often found to be a significant predictor of the strength and direction of political attitudes, beliefs and even of vote choice (Johnston et al, 1996; Althaus, 1998; Fishkin and Luskin, 1999; Crampton, 2009).

Differently informed citizens tend to reason politically differently (Zaller, 1992); uninformed citizens are generally not compelled by “hard issues” or by technical policy information (Carmines and Stimson, 1980), whereas more knowledgeable citizens are more likely to be aware of such issues and vote according to them. Furthermore, political knowledge tends to render stability, coherence and constraint to the system of political beliefs held by citizens (Converse, 1964; Bartels, 2005; Bartels, 2007). All in all, informed citizens tend to make political decisions and hold political beliefs that follow patterns more similar to those that can be observed at the level of political elites (Converse, 1964²).

² Converse observed that the correlations between the attitudes of political sophisticates, unlike those of the uninformed citizens, closely approximated (in direction and size) the correlations between the attitudes of political elites.

While all these findings have solid theoretical and empirical grounds, there is an important amount of research that argues that the effects of political knowledge can be counterbalanced by certain cognitive shortcuts or cues (Popkin, 1993; Lupia, 1994; Lupia, 2006; Lupia et al, 2007). The main argument is that people do not make political decisions based on factual, objective knowledge of things political as much as they make more or less successful use of certain cognitive heuristics that inform their political behavior. Gathering enough political knowledge to inform one's political decision (be it vote choice or simply the decision to sign a petition) is often a very time consuming and costly enterprise (Downs, 1957), thus, citizens tend to reduce their personal contributions to the making of political decisions by delegating costs to other parties (reliable NGOs, parents, spouses, etc.) or by using certain cognitive shortcuts (Popkin, 1993; Lupia, 1994). Cue-like properties can be attributed to ideology and party identification as well (Fiorina, 1981; Lupia, 2005; Lupia, 2007; Lupia, 2016), as long as they streamline people's judgments of political objects.

Importantly for this dissertation, political institutions can also reduce the impact of knowledge asymmetries on the distribution of votes, behaviors and attitudes. This is because the cognitive expense required for a political decision must depend on properties of the decision itself, which is always context-specific. As macro-level predictors of information effects, institutions have the appeal of being invariant across large numbers of individuals, which makes them particularly amenable to empirical analysis.

Heuristics can be rather efficient ways of dealing with the potentially high costs of accumulating the knowledge necessary for making informed political decisions. However, there is no agreement in the literature regarding the actual extent to which heuristic cues close or reduce the behavioral, attitudinal and decisional gap between the informed and the uninformed. There is consistent evidence that neither cognitive shortcuts nor ideology or party identification compensate entirely for the lack of political knowledge (Althaus, 1998; Bartels, 1996; Lau and Redlawsk, 2001; Sturgis, 2003;

Crampton, 2009 for party identification³); more informed people indeed vote differently from less informed ones. In fact, the success of cues in compensating for lack of knowledge must depend on the individual characteristics of the cue-taker (the ideological persuasion of a candidate is irrelevant for a citizen with no clear ideological leanings), the cue or heuristic itself (a candidate's tie color is probably less relevant than her partisanship), the cue giver (an informed peer's endorsement of a candidate is likely more relevant than a celebrity's endorsement) and the political environment (a candidate's partisanship is less informative in countries where party discipline is negligible). The latter is discussed at considerable lengths in this dissertation.

1.4. Conceptual clarification: Information Effects

An information effect is understood as the amount of change expected in a desired outcome in response to a measurable change in people's level of political knowledge. Information effects cannot be directly observed, just counterfactually inferred. This is a direct consequence of the lack of an objective and universal standard by which to assess whether a political outcome is “enlightened”. Estimates of information effects are necessarily model-dependent, and different operationalizations of information effects are bound to lead to diverging conclusions. Thus, any comparative study searching for the causes of big and small information effects needs to confront the question of model choice.

The simplest information effect considered in this dissertation is the linear effect of political knowledge, estimated with an OLS (or a binary logistic) regression model while controlling for multiple demographic variables. This operationalization makes the indefensible assumption that knowledge is equally consequential regardless of a citizen's personal characteristics, which is incompatible with the idea that the effectiveness of cues and heuristics should partly depend on the

³ In fact, the author shows that it is the more politically knowledgeable who make successful use of party identification as a cognitive heuristic: the interaction term between party identification and political information has a positive effect on vote choice. This is consistent with Lau and Redlawsk (2011) finding that cues are more useful to the political sophisticates.

individual characteristics of cue-takers.

An alternative approach is deemed superior (Zaller, 1992; Bartels, 1996). Acknowledging the heterogeneity in people's information processing capabilities and styles, and the asymmetry in the utility of information for people with different personal characteristics, information effects can be computed as the sum of all the effects of political knowledge on the desired outcome over a large number of possible pathways (Bartels, 1996; Delli Carpini and Keeter, 1996). Thus defined, information effects are obtained from models where political knowledge is interacted with all the other variables in a model specification. For every individual, the information effect on a given behavioral or attitudinal outcome is equal to the difference in the expected value of the outcome variable corresponding to a hypothetical change in the individual's level of political knowledge.

1.5. Outline of the Dissertation

The thesis starts with a discussion on the concept of political knowledge, its theorized importance in facilitating a multitude of desirable democratic outcomes and its rather underwhelming performance in empirical studies. Several probable causes are advanced, and the reliability of political knowledge measurements is brought into question. Large amounts of random noise in the estimates of political knowledge can prevent researchers from detecting its effects, as measurement reliability correlates with the strength of the associations between political knowledge and its common covariates. Upon further investigation into the causes of the particularly low reliability of knowledge scales obtained with CSES data, I find that the technical properties of the questionnaire items composing the knowledge scale, as well as the skewness and kurtosis of the scale itself, account for most of the variation in measurement reliability. This translates into drastic attenuations of the estimated effects of political knowledge on its covariates, that could have been prevented in the early stages of survey design and data collection.

Hindsight aside, our prospects seem bleak if we aim to detect weak effects of political knowledge with the available metrics, unless we succeed in overcoming this major impediment.

This is precisely what chapter three attempts to achieve. Drawing on insights from the previous literature on information effects (Bartels, 1996; Althaus, 1998), I compute information effects on political efficacy, satisfaction with democracy and individual turnout, using simulation models that account for a multitude of indirect effects of knowledge on the outcome variables, in addition to the direct effect. I find significant information effects in most of the election studies in the three modules of the CSES. I demonstrate that the method employed here displays considerably less susceptibility to effects of measurement noise compared to the simpler operationalizations of information effects. I verify this claim using simulations on fictitious data and find that the impact of reliability on the magnitude of information effects is minimized when large numbers of covariates are present in the model specification. The findings in chapter three allow us to move on to testing the hypotheses discussed in the previous sections of this introduction.

Chapter four focuses on the relationship between political knowledge and vote choice. After describing the mechanism by which political information is expected to act upon citizens' decision-making process, I use interactive simulation models to estimate the difference between the distribution of votes predicted with the real data and the distribution predicted for a hypothetical electorate with higher levels of political knowledge – the “enlightened” constituency (Althaus, 1998). This exercise returned significant estimates of information effects in the vast majority of all election studies. Weaker information effects are found in countries with polarized party systems, where a small number of parties compete in districts of limited size, and govern alone rather than as part of coalitions. Importantly, these institutional effects appear to be indistinguishable from 0 when the response variable (information effect) is operationalized as the direct impact of political knowledge on vote choice, which lends additional credibility to the simulation method. I find that the information effects themselves are

indistinguishable from zero in almost half of all the sampled election studies if only the direct effect is considered; this corroborates Zaller's (1992) conjecture that most of the effect of knowledge on vote choice must be indirect.

The next and final empirical chapter makes use of the same methodology to investigate the sources of cross-country variations in information effects on diffuse support for the system: internal and external political efficacy, satisfaction with the way democracy works and political participation (turnout). I theorize that consolidated democracies have a legacy of relatively high levels of responsiveness and accountability, and knowledgeable citizens are more likely to discern this by virtue of their increased propensity to hold opinions congruent with their objective political reality. I find that in virtually all countries that have had an undeniable democratic status in a continuous fashion after the end of World War II, higher levels of political knowledge are associated with more satisfaction with democracy, higher levels of political efficacy and higher propensities to turn out in elections. I hypothesize that pro-democratic attitudes and behaviors can be arrived at not only by rational means, but also by affective ones. In polities that are more successful at building and maintaining citizens' sense of community, where the mechanisms linking citizens' preferences to governmental policies are intuitively understood, where people can feel close to political parties or candidates and a plurality of political interests are represented in governmental bodies, political knowledge is less consequential.

The final section of the dissertation summarizes the most relevant substantive findings and methodological advances of the manuscript, and discusses their importance in the political science literature in general, and in the narrower field of public opinion and information effects. Here, I address the possible criticisms of my approach and analysis and suggest improvements for future research. I wrap up with a few concluding remarks with regard to the normative implications of my findings.

CHAPTER 2: EXPLAINING THE RELIABILITY OF POLITICAL KNOWLEDGE SCALES

The estimation of how knowledge gains can influence individual or aggregate level behavioral and attitudinal outcomes is a frequent exercise in the study of citizens' political behavior. Yet no published study seems ever to have considered how the results of such analyses may be sensitive to the way citizens' political knowledge is measured. There are plenty of alternatives regarding - and much lively debate about - how to best measure political knowledge, but few if any publications in this field considered how the competing options that co-exist in the literature create problems of comparability and equivalence between different studies. I take advantage of the CSES study that features several dozen election studies in different elections that all used different questionnaire items for the measurement of political knowledge. This study allows us to investigate how a selection of technical properties of such questionnaire items (item difficulty, question format, partisan cues, types of answers required, skewness and kurtosis) influence the reliability of knowledge measurements and their potential to explain outcomes of interest for political scientists. A first step towards this end is to evaluate the relative quality of various measurements of political knowledge in order to better grasp the amount of noise concealed in survey-based knowledge scales.

2.1. Introduction

The political literacy of citizens has been central to the study of public opinion throughout the history of political science as a discipline. That more knowledgeable citizens are able to make better decisions than their less knowledgeable peers may appear borderline tautological; yet the bulk of the empirical evidence on information effects to date brings limited support for such a grand conclusion. Consolidated representative democracies were found to be reasonably functional despite the alarmingly low levels of political knowledge among their citizens (Campbell et. al., 1960; Berelson, 1954). The acquisition of political knowledge does not appear to overwhelmingly sway public opinion from one side of the political spectrum to another: Sturgis (2003) estimates a 7 percent aggregate change in vote choice in response to unrealistic increases in the public's level of political knowledge, Althaus (1998) finds that such increases would switch the majority support from one side to the other in the case of one out of five political issues. Overall, good decisions do not require high levels of factual knowledge about politics (Lupia, 1994), or, alternatively, informed political decisions may be almost as poor as uninformed ones. I argue that, to some extent, the failure to find substantively significant differences between the informed and the uninformed may stem from the use of imperfect metrics.

All scientific truth is procedural in origin. Thus, the debate on the utility of knowledge can only lead to empirically true conclusions to the extent that the methodological decisions made in the process are internally consistent and externally valid. I argue that some of the decisions that researchers routinely make in their scholarly work are often insufficiently scrutinized and possibly consequential. This chapter investigates the effects of specific decisions at the level of data collection on the reliability and validity of the measurements of citizen political knowledge. To this end, I concentrate my attention on properties of the questionnaire items used for the measurement of knowledge, such as format (open-ended, multiple choice or true-false), type of information required for

a correct answer (verbal or numeric, name recognition), the partisan balance of the items; and on distributional properties of the additive scale, such as skewness, kurtosis and mean scores (scale difficulty). In order to estimate the reliability of scales I make use of established statistics such as Cronbach's Alpha and Loevinger's H, and complement the findings with a customized Alpha coefficient that is less reliant on the distributional assumptions of Cronbach's.

This chapter illustrates some of the consequences of the use of unreliable knowledge scales in correlational studies, guided by the theoretical expectation that noisy measurements tend to attenuate correlation coefficients. It focuses on the relationship between scales of political knowledge and political participation, educational attainment and income, as previous studies have found such variables to be statistically and substantively significant correlates of political knowledge. This will shed light on the differential convergent validity of scales of different build, and help us understand to what extent the individual level payoffs from political knowledge are understated or obscured due to the imperfect measures employed. I use data from the three modules of the Comparative Study of Electoral Systems (CSES) for all empirical analyses.

2.2. On the Measurement of Political Knowledge

Most measures of knowledge are based on counting the correct answers given by respondents to quiz-like questionnaire items. An increasing number of research articles use factor analysis or related methods for creating more reliable scales based on such quizzes. Most notably, IRT models (Delli Carpini and Keeter, 1993), Rasch models (Selb and Lachat, 2009) and Mokken scales (Vettehen, Hagemann, and Snipenburg, 2004) may be superior to additive scaling (count of correct answers) due to their decreased sensitivity to assumption violations. This chapter, however, deals with the operationalization of knowledge as the additive of correct answers to knowledge quizzes, as it is by far

the most common approach due to its simplicity, thus scrutinizing it is likely to be of greater relevance.

The political knowledge items in any given survey represent a sample of all the possible items tapping into a more general skill – political literacy in this case. The population of politically relevant data is potentially infinite, thus, there is no conceivable way of establishing the randomness of any sample of items (Delli Carpini and Keeter, 1993). Under the assumption of unidimensionality (Zaller, 1986; Smith, 1989) and to the extent that the selection of items approximates a random sample from the population of possible political information items (Nunnally, 1978), the validity of the measurement can be assumed with little concern for question contents. Following Delli Carpini and Keeter's conclusion that political knowledge items tend to align on a single factor of general knowledge (1993), this analysis works with the assumption of unidimensionality and focuses on the determinants of scale quality other than the issue contents of the sampled items. For the remainder of this chapter, the main focus will be on the reliability of scales and its determinants.

2.2.1. Question formats

Surprisingly little research was published on the matter of format effects on the quality of political knowledge measurements. There are three qualitatively different kinds of quizzes of political knowledge that are concurrently used. Some knowledge items are of true-false type (“Is Segolene Royal the president of France?”), others have multiple response categories (“Which international organization is Switzerland a member of: The Commonwealth of Nations, The United Nations, The European Union, or the North Atlantic Treaty Organization?”) and others have open ended responses (“Please name the Chief Justice of the United States”). There is no scholarly consensus as to which of these measures should perform better in terms of reliability or validity, yet there are strong theoretical arguments both in support of and against each format.

Open-ended questions require the respondent to be able to retrieve information from their memory without helping cues, whereas closed-ended items contain additional information that the respondent can refer to when answering the question (response categories in multiple choice questions) and/or allow people to guess the correct response (both multiple choice and true-false items). Thus, open ended questions not only measure the respondents' levels of political knowledge but they also test the quick recall ability of respondents (Lupia, 1994). Those people who shy away from providing an answer due to imperfect memory, personal insecurity or self-consciousness will appear less knowledgeable than they are in fact. Non-responses induced by such psychological phenomena that are theoretically orthogonal to political knowledge will be referred to as false negatives; conversely, correct responses to closed-ended questions will be referred to as false positives to the extent that they are induced or favored by guessing in closed ended questions.

These issues related to questionnaire design are particularly important due to questions of validity and reliability. It is noticeable that open ended questions systematically underestimate the level of political knowledge of respondents due to the aforementioned false negatives, whereas true-false and multiple choice questions tend to overestimate it through false positives (Delli Carpini and Keeter, 1993). This fact would not pose any kinds of problems were the underestimations and overestimations random – homogeneously spread throughout the sample. However, as previous findings have shown, there are statistically significant differences between those who are willing to attempt at guessing and those who shy away from doing so: men, people who are less educated, those who are interested in politics and those who are more self-confident are more likely to try to attempt at guessing when they don't know the answers (Schuman and Presser, 1980; Steele and Aronson, 1995; Sturgis and Smith, 2010). Furthermore, the amount of random guessing peaks when the political interest question precedes the set of knowledge items (Sturgis and Smith, 2010) and the “don't know” response category is omitted (Miller and Orr, 2008).

The heterogeneity in the patterns of guessing point to the very stringent problem of measurement bias (Sturgis and Smith, 2010). Certain studies on political knowledge, especially those discussing the gender gap, or the knowledge gap between low and high socio-economic status citizens, may be affected by the heterogeneity in the patterns of guessing (Mondak and Anderson, 2004; Lizotte and Sidnman, 2009). The observed levels of political knowledge for men and for less educated people (Schuman and Presser, 1980; Steele and Aronson, 1995; Sturgis and Smith, 2010) are likely to be artificially increased by format effects. Survey items will overestimate the knowledge of men, thus overestimating the knowledge gap between men and women (Lizotte and Sidnman, 2009; Mondak and Anderson, 2004); conversely, guessing will increase the scores obtained by lower educated people (who appear to have high propensities to guess according to the aforementioned studies) thus decreasing the observed knowledge gap between the educated and the uneducated. The non-independence of measurement errors severely affects the validity of the measurement and contributes to violations of basic assumptions of most test statistics, most notably the assumption of homoskedasticity (Fox, 1984).

To exemplify, let us consider the gender gap in political knowledge. With a hypothetical perfect correlation between gender and guessing propensities (all men attempt at guessing, no woman ever does), on a true-false quiz the mean political knowledge for men would converge to .5 whenever the difficulty of the test approaches maximum (when nobody actually knows the correct answers), whereas the same statistic for women would converge to 0. Equally knowledgeable respondents of opposite genders would only have an equal score in conditions of minimum test difficulty, when essentially everyone would answer all questions correctly, thus the scores would be invariant throughout the sample and the test's power of discrimination essentially nil. A test of medium difficulty and discrimination may perform well in estimating the knowledge of women, but the noise generated by the guessing of men will render the political knowledge variable inefficient in estimating information

effects, thus eluding empirically true effects. In models aimed at estimating information effects, such problems could be circumvented by controlling for all the determinants of guessing. While this may be a plausible solution to the problem, it is likely to require a large number of degrees of freedom as well as information that is unavailable or unattainable.⁴

The phenomenon of guessing affects reliability by increasing noise and escalating type II errors. There is little doubt that some of the null or substantively insignificant findings in the literature were partly due to format related measurement noise. The psychometric literature provides us with rather compelling illustrations of the effects of question format on guessing. For instance, Kubinger and his associates (2007; 2010) noticed a significant decrease in the rate of correct answers to test items with more response options. While the one out of six multiple choice format fosters significant amounts of guessing, the two out of five⁵ format abruptly decreases the rate of random guessing by making it very hard for respondents to choose the correct answer by chance (Kubinger et al, 2010). If the same relationship between the number of response options and the amount of guessing holds true for items with fewer response options, I expect the true-false format to register the highest amount of guessing, followed by the multiple choice and the open-ended format.

At this point one could be tempted to conclude that closed-ended questions should be replaced by open-ended ones to ensure a more reliable and valid measurement of political knowledge. However, previous studies have shown that open-ended questions are also plagued with measurement error (Gibson and Caldeira, 2009; Prior and Lupia, 2008). As mentioned previously, open-ended items foster false negatives by overlooking potential knowledge in respondents who shy away from giving an answer due to personal insecurity; this phenomenon is likely correlated with personality traits and

4 For instance, hypothetically, if the level of testosterone in our subjects accounts for a significant amount of variation in their patterns of guessing, the availability of relevant data becomes problematic.

5 There is a unique combination of two responses that are counted as correct answers to the question. Every other combination is incorrect; thus, the probability of guessing the correct answer is reduced from 1/6 (in one out of six formats) to 1/10.

individual differences such as competitiveness and risk-taking (Mondak, 2001). Furthermore, open ended knowledge items also test the respondents' memory by rewarding quick recall abilities (Lupia, 1994). While knowledge is likely to be among the covariates of recall ability, the two constructs are conceptually distinct and empirically only partially interdependent. To the extent that political information is not a perfect function of recall ability, boldness and self-confidence, open-ended questions are bound to induce measurement error.

The survey setting itself can also contribute to the generation of false negatives in open ended questions. Answering quiz questions requires a certain degree of cognitive effort that survey participants have no real incentive to expend (Prior and Lupia, 2008). Failing to motivate the respondents to engage with the knowledge quiz will generate higher rates of false negatives in open ended items compared to closed-ended ones if the open ended format is indeed more cognitively demanding than closed-ended ones.

Another shortcoming of open ended tests is that their coding is often not fully transparent (Boudreau and Lupia, 2011), either because no clear frame of reference is given to clarify what counts as a correct answer and what does not (Gibson and Caldeira, 2009), or because the verbatim responses of subjects are not transcribed for subsequent review (Boudreau and Lupia, 2011), thus making it impossible to revise the initial decision of the survey interviewer. Moreover, situations may arise when knowledgeable respondents give a whimsical or colloquial yet fully accurate response, coded as incorrect due to overly strict criteria applied by survey interviewers (Gibson and Caldeira, 2009; Boudreau and Lupia, 2011). The ANES item asking respondents to identify William Rehnquist as the Chief Justice of the United States is a telltale example of such misuses of open-ended questions, as “main honcho of the Supreme Court”, “Chief Justice of the Supreme Court”, and “the main judge in the supreme court” were coded as incorrect (Gibson and Caldeira, 2009), in line with the instructions given to survey interviewers. Other times the instructions were wrong or misguided, as in the example of the

ANES item asking the respondents to name the office held by Tony Blair, where the interviewers were instructed to code “Prime Minister of the United Kingdom” incorrect, and “Prime Minister of Great Britain” correct, due to erroneous considerations altogether (Boudreau and Lupia, 2011). Many of these issues were addressed in subsequent waves of the ANES by changing the frame of reference, so that answers that were previously labelled incorrect would be considered correct in newer surveys and vice-versa (Krosnick et al, 2008). This, of course, runs against the definitional requirement for measurement reliability, which states that a measurement tool is considered reliable if its repeated use returns the same results (Nunnally, 1978). To overcome all these limitations, more transparent alternative ways of automated coding open-ended items have been proposed (DeBell, 2013), breaking down partial knowledge into categories that reflect the specific type of information about the subject matter that was found in the respondents' answers.

In light of all the considerations laid out in this section, it is apparent that no question format is intrinsically superior to the other. In the absence of objective measures of political knowledge, one can only make comparisons between one imperfect scale and another. Both open ended and closed ended items display considerable problems with reliability and validity. However, it is an empirical question whether the open-ended format performs better than closed-ended ones for measuring political knowledge.

2.2.2. Numeric responses, name recognition, partisanship

Several other formal and technical properties of questionnaire items may affect the reliability of knowledge scales in conceivable ways. As any superficial survey of the knowledge items in a cross-national study can reveal, there is great variation in the types of answers such questions require, and in the way they expect the knowledgeable citizen to relate cognitively to her polity. Respondents are

quizzed on procedural aspects of electoral politics (electoral thresholds, electoral systems, duration of campaigns, timing of elections), on names of public officials and of their respective political offices (district representatives, cabinet members, central bank governors, etc.), on foreign affairs, historical and geopolitical issues, bureaucratic, administrative, policy related, party positions, etc. Intuitively, all these reflect facets of political literacy, but different faculties may be at work when the respondents are quizzed on different kinds of political matters. To the extent that citizens are unequal with regard to such personal attributes, their performance on political knowledge quizzes can be more or less accurate as a measure of their true level of political literacy. To illustrate this point, let us imagine two respondents, both aware of the size of their country's parliament, but unequally skilled at arithmetics. A survey item inquiring about the minimum number of seats required for a majority in parliament would not have the same level of difficulty for the two respondents. In line with previous findings in the literature (Elff, 2009; Fuchs, 2009), I thus propose a distinction between political knowledge items that require a numeric response and those that do not.

As argued earlier, knowledge quizzes rely partially on people's quick recall abilities, leading to higher scores for respondents whose memory skills are more fit for the task and/or survey setting. However, people can have predispositions for remembering some snippets of information or kinds of information better than other kinds, as suggested by the existence of separate neurological pathways for memorizing lexical and semantic information (Flude et al., 1989). Some of the respondents may have a good memory of names of public officials and their respective political offices— lexical memory – without having any significant contextual information about the politician in question, rendering such knowledge of names futile or ineffectual. Conversely, people can have a good memory of facts and narratives – semantic memory – while being all but incapable of remembering any names for subsequent retrieval. The overwhelming majority of the sample likely possess both kinds of memory skills in variable amounts, and a politically knowledgeable individual would certainly be one who is

able to connect names of officials to their political background. Nevertheless, the amount of semantic information that can be remembered is potentially infinite, whereas the number of names of officials in any given country is finite, albeit prohibitively large. Consequently, one's failure to retrieve from memory a semantic information is less symptomatic of an overall low level of political knowledge, compared to one's inability to name a public official. While designing survey items that solely test the respondents' name recognition abilities may give an unfair advantage to people predisposed to have a good memory of names – thus raising questions about the validity of the resulting knowledge scale, it may increase the overall reliability of the measurement by reducing the number of false negatives that would have been generated by the vastness of the scope of semantic knowledge. Following Elff (2009), I argue that name or office recognition items are likely to have a measurable impact on the quality of the measurement of political knowledge.

Using name recognition items, however, may come with a cost. Many public offices are politically appointed, and partisans are likely to be more familiar with the names of politicians from their preferred political party. To the extent that partisanship can play a role in the subjects' performance on the political knowledge quiz, partisans will display levels of political knowledge higher than their true score. To this end, I record the number of items in each election study where partisanship could have aided the respondents to achieve a better political knowledge score.

2.2.3. Distributional properties: skewness and kurtosis

There is broad consensus in the political information scholarship that reliable measurements are to be sought, and some of the concerns for reliability emerge at the stage of questionnaire design, as implied by the attention given by polling institutions to the expected distributional properties of the data on political knowledge. The fact that election study teams are instructed to design quiz questions of

varying difficulty (see the CSES documentation available at www.cses.org/datacenter) stands proof for such concerns, and the usual reporting of Cronbach's Alpha alongside descriptive statistics for political knowledge variables in scholarly articles suggests that the distributional effects on their reliability are at least intuitively discerned.

The empirical evidence supporting such concerns about the distributional properties of political knowledge scales is still lacking, but some justification can be found in the psychometric literature (Sheng and Sheng, 2012). Test scores with highly leptokurtic (peaked) distributions tend to deflate alpha well below its true value, whereas platykurtic (flat) distributions mainly affect the magnitude of error terms in the estimation of alpha (Bay, 1973). These effects are mediated by sample size and test length, their magnitude being largest in small samples and in quizzes with few items. Skewness and kurtosis also jointly affect the performance of alpha, with skewed leptokurtic distributions grossly underestimating true alpha and platykurtic ones often overestimating it (Sheng and Sheng, 2012). As political knowledge quizzes are generally performed on large samples with relatively few test items, a particularly relevant finding is that the bias of alpha tends to be affected by sample size when test scores are non-normally distributed, as the standard error of alpha decreases (Sheng and Sheng, 2012). These results come from simulations where the population parameter is known and the bias of all statistics can be accurately quantified. Furthermore, as Sheng and Sheng's study (2012) is exploratory, it is unclear whether there is a true relationship between skewness, kurtosis and alpha-reliability beyond the idiosyncrasies of a particular data generation process. How will the shape of the distribution of knowledge scores affect the reliability of scales of political knowledge on our data remains an empirical question.

Certainly, we cannot directly measure the bias of alpha for political knowledge, as we do not have a reliability parameter for any test of political knowledge, we can only estimate the reliability of the test based on sample statistics. Nevertheless, we can illustrate the robustness of alpha to deviations

from normality by comparing the impact of skewness and kurtosis on it to their impact on other measures of scale consistency. This exercise will not only shed light on the credibility of the reliability estimates reported in the literature on political knowledge, but it will also provide some insight into the actual relationship between reliability and the distributional properties of knowledge measurements.

2.3. Data

All empirical analyses are run on the Comparative Study of Electoral Systems (CSES), modules 1, 2, and 3. The datasets contain a large number of variables of interest for social science research and is composed of representative samples from electoral democracies on all continents. Compared to other databases of similar magnitude, CSES provides considerably more diversity without making major compromises that would hinder cross-country analyses. For the purpose of this study the only case selection employed was lead by the occasional unavailability of the relevant variables in some of the sampled countries. For instance, four election studies were removed from the CSES module 2 database (Bulgaria, 2001; Denmark, 2001; the mail-back stage of the German study; Iceland, 2003) due to lack of valid data on either of the political knowledge variables or due to the unavailability of information about the format of their respective questionnaire items. Similarly, several election studies had to be dropped from Modules 1 and 3 due to the same considerations; please see Appendix I for a full list of the election studies included in the analysis.

In some of the sampled countries only open ended political knowledge items were used (for example Canada, Taiwan, Germany, or Mexico in CSES 1, Brazil, Switzerland and Romania in CSES 2 and Estonia and Iceland in CSES 3), whereas in others all three items were of true-false format (New Zealand in CSES 1, Sweden in CSES 2, Hong Kong in CSES 3, etc.). No multiple choice questions were asked in Module 1. In most countries in Modules 2 and 3, however, the knowledge items were

more diverse in format, thus allowing us to create relevant macro-level question format variables representing the count of open ended, multiple choice and true-false questions used in each polity. For socio-economic status I included variables on age, gender, education and family income; I also included an additive index of political participation based on the participation variables in the initial dataset. The only consideration behind the selection of variables was their empirical and theoretical connection to political knowledge.

The three political knowledge items used in each polity were purposefully designed to match a predefined level of difficulty: in modules 2 and 3, an easy question was used that roughly two thirds of the respondents could answer correctly, a moderate one that approximately half of the respondents could answer, and a harder one on which about one third should appear knowledgeable, whereas the election study teams for module 1 were simply instructed to use questions of varying difficulty⁶. If this pattern holds despite the variations at the level of the format of the respective questions, the most apparent of all format effects – the inflated means for closed-ended questions – will not be easily observable on the CSES data. However, the differences in reliability and validity between open ended and closed ended questions, if real, should be noticeable and quantifiable through the differential association between the quiz items and other variables, between each other, through their relationship with the total knowledge score (count of correct answers to the three items), as well as through other means of assessing reliability that I discuss below.

2.4. Variables included

Several variables were extracted from the original datasets for further use in the analysis. From each election study I retrieved the difficulty of each political knowledge item, the average count of correct

⁶ Information retrieved from the CSES datacenter: http://www.cses.org/datacenter/module1/data/cm1_cod2.txt for module 1, http://www.cses.org/datacenter/module2/20030108_cses2_questionnaire.txt for module 2, and http://www.cses.org/datacenter/module3/cses3_Questionnaire.txt for module 3.

answers to the three-item set (scale difficulty), polychoric correlations (Olsson, 1979) between the items and the full scale as well as interitem correlations, their correlation with educational attainment (as a main correlate of political knowledge), correlations with age, income and individual vote turnout. Additionally, I computed scale reliability statistics: Cronbach's Alpha (Cronbach, 1951) and Loevinger's H (Mokken and Lewis, 1982), a standardized Alpha that replaces covariances with polychoric correlations in the original formula, as well as individual item effects on the overall reliability of the full 3-item scales. From the CSES datacenter (www.cses.org/datacenter) I obtained information about the format of each of the knowledge items used (multiple choice, true or false, open ended), and also recorded the number of items per election study that required a numeric response (whether the correct answer was a quantity). Additionally, I recorded the number of knowledge items in each election study that inquired about the names of political figures or of the public offices they hold. For each election study, I recorded the number of items that are likely to be found easier by the supporters of one party or another. Questions that inquire about the names or actions of specific cabinet ministers, junior ministers, members of parliament, party leaders or party members, were counted as partisan; questions inquiring about prime ministers, presidents, or prominent historical figures were not considered partisan.

Finally, it can be argued that the professionalism and engagement of election study teams would contribute to better political knowledge items in terms of reliability and validity. While there is no direct measure of this, the availability of an English translation for the questionnaire used can be employed as an admittedly crude proxy for the collaborators' level of engagement with the CSES project. This variable, of course, can only be informative in the case of countries that do not have English as a primary language (Australia, Canada, Great Britain, Ireland, New Zealand, Hong Kong, United Kingdom and the United States).

2.5. Analysis

All the variables mentioned above were collected in a database with 97 units of observation representing election studies. All composite variables are continuous, with ranges from 0 to 1 for the reliability estimates and -1 to 1 for all correlation coefficients, whereas the values of all count variables⁷ are integers ranging from 0 to 3 and the variable distinguishing between the election studies that provided an English translation and those who did not is dichotomous.

In line with expectations, the three knowledge items in each country differ significantly in difficulty. While the overall average rate of correct responses is just over 0.5 (0.52), the separate items vary in difficulty between an average of 0.33 for the most difficult items and 0.70 for the least difficult ones. In a few cases the rate of correct responses is alarmingly low or exceptionally high, thus rendering the quality of the measurement questionable at best (Nunnally, 1978; Delli Carpini and Keeter, 1993). In the United States (1996) the most difficult item returned less than 10 percent correct answers, whereas in Spain, (2000), Ukraine (1998), Chile (2005), Finland (2003), Ireland (2002), Israel (2003), Korea (2004), Romania (2004), Taiwan (2001), United States (2004) and Iceland (2009), the easiest item returned more than 90 percent correct responses. This leads to a lower power of discrimination for these items and is bound to affect the reliability of the measurement in a negative way (Nunnally, 1978). Finally, the difference between the ratio of correct to incorrect answers varies very little – up to 10 percentage points – from the least difficult to the most difficult item in Israel (1996), Poland (2001), Slovenia (2008), Thailand (2005) and Norway (2005), which constitutes a slight departure from the text book example of H consistency (Mokken and Lewis, 1982), but should not affect the alpha reliability of the scale (Nunnally, 1978).

The average Cronbach's alpha for the additive knowledge scale is .48 in the pooled data, with

⁷ The number of multiple choice, true or false, and open ended items used in each election study, as well as the count of items that require a numeric response, the recognition of a name or public office, and the count of items that may be easier depending on the partisanship of the respondents.

only three polities reaching traditionally acceptable levels of reliability for the measurement of knowledge (Taiwan, 1996, $\alpha=.78$; Poland, 2001, $\alpha=.73$, Thailand, 2007, $\alpha=.82$) and fifteen more – Sweden, 2006; Poland, 2007; Poland, 2005; Iceland, 2007; Greece, 2009; Taiwan, 2008; The Czech Republic, 1996; Romania, 1996; Italy, 2006; Kyrgyzstan, 2005; The Netherlands, 2002; Norway, 2001 and Spain, 2004; Slovenia, 2004; The United States, 2004– having alpha estimates between .6 and .7. That amounts to approximately 1/5 of the entire sample, thus, the measurement appears particularly weak even by social science standards (Nunnally, 1978). However, it is worth noting that some of the coefficients may be highly unstable due to assumption violations. Not only that the data is binary, thus rendering variance-covariance based estimates inaccurate (Cronbach, 1951), but some of the items have a difficulty level far beyond the range recommended in the literature (Delli Carpini and Keeter, 1993).

With all knowledge items being binary and displaying a consistent pattern of differential difficulty across elections, Loevinger's H coefficient for Mokken scales should provide a more realistic estimate of the internal consistency of the measurement (Mokken and Lewis, 1982). To this end, I computed the H coefficient for all elections and found an average score of 0.44, which shows that in the average election study, the CSES political knowledge items conform to the general pattern of Mokken scales (Garson, 2011). While the alpha coefficients correlate strongly with H, ($r=0.49 / 0.86 / 0.83$ for modules 1/ 2/ 3 and 0.76 on the pooled data)⁸; the latter shows that in a majority of election studies the performance of respondents on one knowledge item is predictive of their performance on the other items. In 54 out of the 85 elections with complete data on the three knowledge items, the items appear to display hierarchical difficulty: respondents who answer correctly to an item of high difficulty ($p(1)\approx 0$) are indeed very likely to answer correctly to easier items ($0 < p(1) < 1$). H exceeds the threshold of .4 (Garson, 2011) in all these cases, suggesting that the measurement of political

⁸ The coefficient is weaker for module 1 probably because the election study teams were not given clear instructions regarding the desired difficulty of the items

knowledge is at least moderately internally consistent.

The reliability of the measurement varies considerably across election studies, with a standard deviation of .14 for alphas, .16 for Loewinger's H and .16 for polychoric alpha in the pooled dataset. On average, in the pooled data additional knowledge items do not increase alphas or H significantly, but they contribute to a reduction in their variability, likely rendering the estimates more robust.

2.5.1. Distributional properties: skewness and kurtosis

All but four election studies (Chile, 2005; Korea, 2004 and 2008; and Thailand, 2007) produced platykurtic ($kurtosis < 0$) distributions of scores on political knowledge, whereas skewness appears to be normally distributed around a mean of -0.1, with a standard deviation of .5 on the pooled dataset. Since there is no qualitative difference between a left skew and a right skew departure from normality, the folded variable was used for all subsequent analyses and raised to the power of $\frac{1}{2}$ to approximate a normal distribution. Due to the highly asymmetrical distribution of kurtosis across the sample, no analysis could be performed on the few leptokurtic cases⁹, thus all the reported results are based on the platykurtic bulk of the sample.

The three measures of internal consistency are regressed on skewness and kurtosis, and their multiplication term, anticipating that the two distributional properties should jointly account for some of the variation in the reliability of scales and their robustness to deviations from normality. The regression estimates are presented in Table 2.1 below.

⁹ Chile, 2005; Korea, 2004; Korea, 2008 and Thailand, 2007

Table 2.1: OLS Estimates for Score Distribution Effects on Measures of Reliability

	Pooled Data	Module 1	Module 2	Module 3
DV= Cronbach's Alpha				
Intercept	-0.15*	0.15	-0.19*	-0.26*
Skewness	1.62*	0.49	1.73*	1.89*
Kurtosis	-0.58*	-0.29	-0.62*	-0.68*
Skewness*Kurtosis	0.98*	-0.10	0.99*	1.20*
<i>Adj R</i> ²	0.66	0.64	0.63	0.73
DV= Polychoric Alpha				
Intercept	-0.07	0.47	-0.15	-0.30*
Skewness	1.63*	-0.40	1.79*	2.18*
Kurtosis	-0.54*	-0.01	-0.60*	-0.73*
Skewness*Kurtosis	0.93*	-0.99	0.79	1.45*
<i>Adj R</i> ²	0.44	0.03	0.49	0.62
DV= Loevinger's H				
Intercept	0.08	0.56	-0.01	-0.09
Skewness	0.92*	-0.48	1.02*	1.44*
Kurtosis	-0.30*	0.14	-0.37*	-0.47*
Skewness*Kurtosis	0.37	-0.86	-0.13	1.13
<i>Adj R</i> ²	0.13	-0.09	0.25	0.19
<i>df</i>	87	21	31	27

*p<0.05

The intercept reflects the reliability estimate for knowledge scales with normally distributed scores. It is important to note that all parameter estimates are affected by the specification of the model; while the intercepts are negative and substantively significant in the models whose results are presented above, they are either positive or indistinguishable from zero when the interaction term is excluded from the specification. In fact, the scales that approximate a normal distribution better (The Netherlands, 1998; Mexico, 2003; Taiwan, 2001) have alphas just below the average, in the range of 0.35 and 0.41.

The surprising finding is that the more platykurtic and skewed a distribution of scores is, the higher the reliability of the measurement. This is especially true when reliability is estimated with Cronbach's Alpha, where skewness and kurtosis account for more than half of the variance of Alpha.

As we loosen the assumption of normality inherent in the construction of Alpha (Cronbach, 1951), we observe a slight decrease in model fit. When polychoric correlations are used in the formula of Alpha, thus assuming that a normally distributed latent trait underlies the observed discrete values of the knowledge variables (Olsson, 1979), skewness and kurtosis account for just over 44% of the variance of Alpha on the pooled dataset. When even this assumption is relaxed, the explanatory power drops further, and the shape of the distribution accounts for less than a quarter of the variance in internal consistency. The model no longer fits the data for module 1, where the adjusted R^2 even drops below zero. Given the strong correlation between the Alphas and the Loevinger's Hs reported in the previous section, the attenuated effects of skewness and kurtosis on H cannot be attributed to its misrepresentation of reliability, but rather to its comparative robustness to deviations from normality. Nevertheless, the parameter estimates are significantly different from zero and considerably strong even in the models where H is used as measure of internal consistency. Hence, it appears sensible to conclude that skewed and platykurtic score distributions are more reliable than normal ones.

The results reported in this section are admittedly counterintuitive, and they may reflect certain idiosyncrasies of political knowledge as a skill. A more plausible explanation, however, is that platykurtic scale distributions are produced by items of average difficulty, as extremely easy or difficult items produce left- or right-tails. Two items of comparable difficulty can hypothetically be perfectly correlated with each other, whereas the correlations between items with very different thresholds can never be perfectly correlated. The same phenomenon is likely responsible for the higher reliability of skewed scales: items with equal thresholds measuring the same simple construct generate bimodal additive scales. This happens because people either give correct answers to all items, or they do not give any correct answers (save for the occasions where guessing is possible). Such items will correlate very well, and generate skewed distributions at the same time.

If non-normal distributions of scores enhance the reliability of political knowledge measurements, the correlations between political knowledge and its usual covariates should be affected as well. I thus move on to investigating the effects of skewness and kurtosis on the size of the correlations between political knowledge and a selection of its common covariates: educational attainment, income and election turnout. The results are presented in Table 2.2 below.

Table 2.2: OLS Estimates for Distributional Effects on Covariances with Knowledge

	Pooled Data	Module 1	Module 2	Module 3
DV= Correlation Between Knowledge and Education				
Intercept	0.08	0.17	0.12	-0.08
Skewness	0.82*	0.50	0.82*	1.21*
Kurtosis	-0.23*	-0.14	-0.19*	-0.38*
Skewness * Kurtosis	0.86*	0.23	0.83	1.43*
<i>Adj R</i> ²	0.10	-0.06	0.09	0.20
DV= Correlation Between Knowledge and Income				
Intercept	0.05	0.01	0.02	0.05
Skewness	0.59*	1.55	0.78	0.43
Kurtosis	-0.19*	-0.27	-0.21	-0.18
Skewness * Kurtosis	0.62*	1.71	0.58	0.50
<i>Adj R</i> ²	0.06	-0.03	0.04	0.03
DV= Polychoric Correlation Between Knowledge and Turnout				
Intercept	0.13	0.49	0.09	0.13
Skewness	0.21	-1.61	0.52*	0.02
Kurtosis	-0.08	0.24	-0.10	-0.06
Skewness * Kurtosis	-0.03	-1.9	0.44	-0.38
<i>Adj R</i> ²	0.01	-0.07	0.07	-0.05
<i>df</i>	86/75/79	20/20/20	31/23/31	27/24/20

*p < 0.05; None of the models with $R^2 < 0.1$ passed the F-test

I do not find consistent evidence of skewness and kurtosis effects on correlation sizes. The few models where the F-test passed a significance threshold of 0.05 show skewness and kurtosis effects that are consistent with the findings reported in Table 2.1, suggesting that the increased reliability of non-normal knowledge scales may reduce one's rate of Type II errors in studying information effects.

However, these benefits are very weak at best, and they are only observable in the correlation between political knowledge and education, where the true effect is likely sufficiently strong.

Finally, the results found for the effect of kurtosis on reliability can be interpreted as a recommendation for using items of unequal difficulty in political knowledge quizzes. Indeed, the data shows that having different levels of difficulty is advisable, as alpha reliability tends to increase with the differentiation in difficulty between the easier items and the hardest one: alpha correlates at $r=0.2$ with the difficulty difference between the hardest and the medium item; and at $r=0.21$ with the difficulty difference between the hardest item and the easiest item. The election study collaborators seem to have been well advised to design items of $1/3, 1/2$, respectively $2/3$ difficulty.

2.5.2. Question formats

The variable description publicly available on the website of the Comparative Study of Electoral Systems was used to classify the knowledge items as open ended, true-false and multiple choice. The most readily observable format effect (the lower rate of correct answers to open ended items) is not likely to be present in the CSES data, due to the difficulty of the questions being set prior to data collection. Indeed, I find no significant difference in difficulty between open ended and closed ended items ($t = 0.68, -0.42$ and -0.5 on 90 df when the treatment is count of open ended, count of multiple choice, respectively count of true-false items). I thus proceed to regressing the reliability scores – Cronbach's Alpha, Polychoric Alpha and H – on the format count variables in order to see if there is a linear pattern linking question formats to the overall reliability of political knowledge scales. The results are summarized in Table 2.3 below.

Table 2.3: OLS Estimates for Format Effects on Measures of Reliability¹⁰

	Pooled Data	Module 1	Module 2	Module 3
DV= Cronbach's Alpha				
Intercept	0.53*	0.52*	0.51*	0.55*
Multiple Choice	-0.05*	NA	-0.07	-0.04
True False	-0.04*	-0.01	-0.06*	-0.04*
<i>Adj R</i> ²	0.15	0.00	0.20	0.17
DV= Polychoric Alpha				
Intercept	0.58*	0.57*	0.59*	0.59*
Multiple Choice	-0.05*	NA	-0.09*	-0.03
True False	-0.05*	-0.02	-0.09*	-0.05*
<i>Adj R</i> ²	0.20	0.01	0.33	0.16
DV= Loevinger's H				
Intercept	0.49*	0.48*	0.51*	0.47*
Multiple Choice	-0.05	NA	-0.06	-0.03
True False	-0.05*	-0.03	-0.09*	-0.03
<i>Adj R</i> ²	0.15	0.01	0.28	0.08
<i>df</i>	88	22	32	29

*p<0.05

The intercept in all models reflects the reliability of a hypothetical scale based solely on open ended questions. The intercepts are always significant and appreciably higher than the mean reliability in all datasets, as the best estimates for alpha in the three modules are 0.51 (CSES1), 0.44 (CSES2), and 0.50 (CSES3), for polychoric alpha the averages are 0.55 (CSES1), 0.50 (CSES2), and 0.53 (CSES3), and H averages at 0.46 (CSES1) and 0.43 (CSES 2 and 3), whereas the pooled database produces an alpha of 0.48, a polychoric alpha of 0.52 and an H of 0.44. This shows from the outset that open ended items tend to produce higher levels of reliability, and this finding is corroborated by the ubiquity of higher than average values of reliability for open ended scales. Closed ended items in general, and true-false items in particular, systematically deflate reliability. With the exception of the results found on module 1, where all effects are weaker and statistically insignificant, the parameter estimates for the effects of closed ended items on reliability show that every additional item of such

¹⁰ The controls for “engagement of the election study team” and the count of “numeric response” items were not included in the models, as neither of them correlates with any of the reliability measures on any of the datasets.

format will decrease reliability by roughly 0.05. In these conditions, a scale built solely with closed ended items will have an average reliability roughly 0.15 lower than an open-ended scale. Given the generally low reliability of political knowledge measurements, such a difference is likely to be very consequential. Moreover, the format of items accounts for up to one third of the variation in the reliability of scales, although the R^2 varies a lot from essentially 0 in the case of module 1, through 0.15 – 0.20 in most models, to the very high estimates found for module 2 (0.28 – 0.33). These differences do not appear to be attributable to the choice of reliability tests, suggesting that the results are not an artifact of the differential robustness of reliability measures to variations of item format.

Admittedly, most studies employing measurements of political knowledge are not particularly concerned with having scales that perfectly distinguish between more knowledgeable and less knowledgeable individuals. More often than not, political knowledge is used either as a control variable or as a predictor of various substantive outcomes that are hypothesized to be related to political knowledge. To this end, it may be informative to see whether item formats influence the effects of political knowledge on its main covariates. Table 2.3 presents the OLS estimates for format effects on the relationship between political knowledge and education, income and individual level self-reported turnout.

Again, we find that closed ended questions affect the performance of political knowledge measurements. While not all the effects presented in the table below are significant, they are all negative and point in a direction consistent with the findings previously reported. As low reliability is generally the result of sizable random errors of measurement, it is theoretically expected that unreliable measurements will generate either insignificant results or parameter estimates biased towards zero. The results reported in Table 2.4 show that the formats previously found to deflate reliability are also responsible for weakening the observed associations between political knowledge and education,

income and turnout. This supports the conclusion that multiple choice and true-false items decrease the convergent validity of political knowledge scales, yet this is rather unsurprising given that reliability is a prerequisite for validity (Nunnally, 1978).

The size of the format effects (excluding the insignificant results) estimated with the models in Table 2.4 ranges from a beta of -0.02 to -0.08, which means that the expected values of the dependent variables can be lower by as much as 0.24 for closed ended scales compared to open ended ones. As most of the effects of political knowledge on behavioral or attitudinal variables are not stronger than 0.3, it is reasonable to conclude that measuring political knowledge with closed ended items (as in New Zealand in CSES 1, Sweden in CSES 2, Hong Kong in CSES 3, or in the European Election Studies, 2009 and 2014) would render some of these relationships insignificant.

Table 2.4: OLS Estimates for Format Effects on Covariances with Knowledge

	Pooled Data	Module 1	Module 2	Module 3
DV= Correlation Between Knowledge and Education				
Intercept	0.34*	0.38*	0.35*	0.28*
Multiple Choice	-0.02	NA	-0.04	0.00
True False	-0.03*	-0.04 *	-0.05*	-0.02
<i>Adj R</i> ²	0.13	0.13	0.17	0.00
DV= Correlation Between Knowledge and Income				
Intercept	0.27*	0.29*	0.28*	0.24*
Multiple Choice	-0.05*	NA	-0.08*	-0.02
True False	-0.02*	-0.03	-0.02	-0.02*
<i>Adj R</i> ²	0.14	0.11	0.13	0.11
DV= Polychoric Correlation Between Knowledge and Turnout				
Intercept	0.25*	0.26*	0.22*	0.28*
Multiple Choice	-0.03*	NA	-0.02	-0.03
True False	-0.02*	0.00	-0.01	-0.05*
<i>Adj R</i> ²	0.06	-0.04	0.02	0.26
<i>df</i>	89/75/81	22/20/21	33/25/33	29/25/22

*p<0.05

2.5.3. *Numeric responses, name recognition, partisanship*

The same models were run with the remaining item attribute variables as explanatory factors. “Numeric response” is a count of items (ranged 0-3) whose correct answer is a number. Temporal references (“In what year did [*country*] join the [*organization*]”, or “What is the duration of a presidential mandate”), though essentially numerical, were exempted from this category due to the ubiquity of time references in everyday life, rendering people equally capable of retrieving such information from memory regardless of how quantitatively minded they are. The name recognition variable counts the items that require linking the name of a public official to their current or past position. The partisanship variable is a count of items whose difficulty may have been contingent upon the partisanship of the respondent. Many of the name recognition items were also counted as partisan, as we expect the supporters of a certain political party to be more familiar with its members compared to their non-partisan peers. This, however, may not hold in the case of the most prominent domestic or foreign political figures, such as presidents and prime ministers; all items inquiring about such high-profile officials were exempted from this category. Table 2.5 below summarizes the effects on reliability of all these item properties.

Table 2.5: OLS Estimates for Question Type Effects on Measures of Reliability

	Pooled Data	Module 1	Module 2	Module 3
DV= Cronbach's Alpha				
Intercept	0.39*	0.52*	0.28*	0.35*
Numeric response	0.04*	-0.02	0.05	0.10
Name recognition	0.05*	0.02	0.10*	0.06*
Partisanship	0.01	-0.01	0.00	0.02
<i>Adj R</i> ²	0.12	-0.07	0.22	0.34
DV= Polychoric Alpha				
Intercept	0.41*	0.55*	0.32*	0.38*
Numeric response	0.03	-0.05	0.05	0.10*
Name recognition	0.08*	0.07*	0.13*	0.08*
Partisanship	0.00	-0.03	-0.01	0.01
<i>Adj R</i> ²	0.18	0.21	0.28	0.29
DV= Loevinger's H				
Intercept	0.32*	0.43*	0.24*	0.30*
Numeric response	0.03	-0.05	0.06	0.06*
Name recognition	0.10*	0.11*	0.13*	0.11*
Partisanship	-0.00	-0.06	-0.01	0.00
<i>Adj R</i> ²	0.28	0.29	0.32	0.34
<i>df</i>	88	20	32	28

*p<0.05

I find strong evidence in support of the relationship between item attributes and scale reliability. Name recognition items appear to have a strong impact on the reliability of knowledge scales. The reported estimates for the pooled data show that a hypothetical scale constructed only from name recognition items would have an average reliability 0.15 – 0.3 higher than a scale with no name recognition items. The results are inconclusive for the first module of the data, as the model fit statistic (adjusted R^2) shows a complete failure to explain the variance of Cronbach's Alpha using the item attribute variables in the specification. However, all the other models show acceptable levels of model fit, and the effect of name recognition items on reliability is consistently positive, statistically and substantively significant. The figures do not allow us to draw any conclusion regarding the other variables. If there is a relationship between scale reliability and the use of numeric response items, or of

partisanly charged ones, the models fail to show it.

Of course, higher levels of reliability can generally be achieved in scales composed of items of the same kind, as a result of the formal consistency of the scale's construction. This higher reliability would bear no relevance to the aptness of the scale in approximating the empirical construct of political knowledge. However, the failure of the “numeric response” and the “partisanship” variables to reach statistical significance in the models summarized in Table 2.5 suggests that name recognition items bring benefits to scale reliability beyond formal consistency.

The proportion of variance in reliability explained by the models in Table 2.5 ranges from 0.12 (when reliability is measured with Cronbach's Alpha, using the pooled data as input) and 0.34 (on module 3, with Cronbach's Alpha and Loevinger's H as dependent variables), with the sole exception of the model where module 1 data was used for regressing item attributes on Cronbach's Alpha. We thus expect to find that some of the correlations between knowledge and its common covariates will be affected by the item attributes considered in this section of the analysis. The effects of these variables on correlation coefficients with political knowledge are shown in Table 2.6 below.

Table 2.6: OLS Estimates for Question Type Effects on Covariances with Knowledge

	Pooled Data	Module 1	Module 2	Module 3
DV= Correlation Between Knowledge and Education				
Intercept	0.30*	0.40*	0.30*	0.25*
Numeric response	-0.01	-0.05	-0.03	0.01
Name recognition	0.05*	0.05	0.05*	0.05*
Partisanship	-0.04*	-0.06	-0.05*	-0.03
<i>Adj R</i> ²	0.18	0.12	0.18	0.11
DV= Correlation Between Knowledge and Income				
Intercept	0.22*	0.29*	0.17*	0.20*
Numeric response	-0.08	-0.03	0.01	-0.00
Name recognition	0.04*	0.03	0.06*	0.02
Partisanship	-0.01	-0.02	-0.02	0.00
<i>Adj R</i> ²	0.07	-0.02	0.07	-0.02
DV= Polychoric Correlation Between Knowledge and Turnout				
Intercept	0.19*	0.20*	0.19*	0.16*
Numeric response	0.01	0.03	0.00	0.00
Name recognition	0.01	-0.02	0.02	0.03
Partisanship	0.01	0.06	-0.02	0.03
<i>Adj R</i> ²	0.00	0.00	0.00	0.14
<i>df</i>	88/76/81	20/20/20	32/24/32	28/24/21

*p<0.05

The only models with explanatory power above 0.1 are the ones explaining the correlation between knowledge and education using item attributes as independent variables. The coefficients decrease and the fit drops drastically for the subsequent models. This is unsurprising, considering that political knowledge correlates more strongly with education than it does with income or turnout. To the extent that the relative size of the estimated correlations reflects the relative size of their corresponding population parameters, the item attribute variables should perform worse in predicting weak correlations than strong correlations. All in all, the correlation between educational attainment and the average political knowledge scale composed of name recognition items alone is higher by approximately 0.15 compared to a scale without any name recognition items. Finally, partisan items generally attenuate correlations between knowledge and education.

All the results reported so far are from models with no more than three independent variables,

due to the reduced number of degrees of freedom allowed with the separate modules of the CSES data. On the pooled data, however, all the variables discussed in this chapter can be included in model specifications. Table 2.7 shows the effects of all the item attribute variables on the three reliability measures (Alpha, Polychoric Alpha, Loevinger's H) and on the correlation coefficients between political knowledge and educational attainment, income and turnout. Most of the variation in Alpha reliability can be accounted for with variables describing technical properties of the items composing the political knowledge scales. Skewness and kurtosis have a consistently strong effect on Alphas and on the correlation between knowledge and education. Closed ended items depress all correlations and reliability estimates, save for H and the correlation between knowledge and turnout to which our model could not achieve acceptable levels of fit. Name recognition items have a positive effect on reliability, regardless of how the latter is operationalized, and tend to contribute to stronger correlations between political knowledge and educational attainment. Consistent with the results previously reported, I find that education is less conducive to political knowledge when the latter is measured with partisanly charged quiz items or with items whose correct answer is numeric. All in all, the findings for the full model corroborate the results reported from the partial models discussed before.

Table 2.7: OLS Estimates for Full Model

	Alpha	Polychoric Alpha	H	Correlation w. education	Correlation w. income	Correlation w. turnout
Intercept	-0.22*	-0.14	-0.00	0.20*	-0.00	0.05
Skewness	1.49*	1.35*	0.49	0.56*	0.43	0.13
Kurtosis	-0.75*	-0.62*	-0.24*	-0.24*	-0.18	-0.04
Skewness *	1.38*	1.11*	0.06	0.90*	0.78	0.05
Kurtosis						
True-false	-0.01	-0.01	-0.01	-0.03*	-0.02*	-0.01
Multiple Choice	-0.04*	-0.05*	-0.03	-0.02	-0.05*	-0.03
Numeric response	0.01	0.00	0.00	-0.03*	-0.01	0.00
Name recognition	0.02*	0.05*	0.08*	0.03*	0.02	-0.00
Partisanship Scale	0.00	-0.00	-0.01	-0.05*	-0.02	0.01
difficulty	-0.00	0.00	0.03	-0.03	0.00	0.02
<i>Adj R</i> ²	0.75	0.60	0.41	0.39	0.22	0.01
<i>df</i>	78	78	78	78	68	71

*p<0.05

Finally, many questions were raised in this chapter regarding the effects of reliability on the magnitude and significance of information effects, yet only indirect empirical evidence was brought to the fore. Before the concluding remarks, it is worth considering the panel presented in Table 2.8, which reports the correlations between the three measures of reliability used throughout this chapter and the relationship between political knowledge and education, income and turnout. We find on the pooled data that variations in reliability account for a considerable amount of variance in the selected coefficients. As the degrees of freedom deplete (the samples are smaller for modules 1 and 3), some of the correlations lose significance, but judging by the overall size of the estimates we can claim with reasonable confidence that all the correlations with knowledge are affected by the reliability of measurements. With the exception of the effect of Alpha and H on the correlation between knowledge and turnout, the insignificant correlations reported in Table 2.8 are in the range of 0.15 and 0.38.

Table 2.8: Correlations Between Reliability and Bivariate Relationships with Knowledge

DV	IV	Database Used			
		Pooled Data	Module 1	Module 2	Module 3
Effect of Education on Political Knowledge	Alpha	0.43*	0.50*	0.52*	0.35*
	Polychoric Alpha	0.47*	0.60*	0.54*	0.33
	H	0.44*	0.53*	0.48*	0.31
Effect of Income on Political Knowledge	Alpha	0.34*	0.38	0.46*	0.17
	Polychoric Alpha	0.35*	0.42*	0.45*	0.15
	H	0.32*	0.35	0.35	0.20
Effect of Political Knowledge on Turnout	Alpha	0.32*	0.13	0.45*	0.26
	Polychoric Alpha	0.33*	0.23	0.46*	0.26
	H	0.30*	0.06	0.48*	0.33

*p<0.05

2.6. Conclusions

Political knowledge items are often found in large-scale surveys, yet little more than the best intuition of survey contributors is employed in the decision over one question or another. While the potential unreliability of different item formats and score distributions is widely recognized, there is little evidence for the methodological superiority of one measurement or another. This study investigated the matter in an empirical fashion using the CSES modules 1, 2 and 3 as data, which provide considerable cross-country variation in question formats for political knowledge items.

This chapter finds ample evidence that skewed and platykurtic distributions of scores, as well as the use of open-ended and name recognition items in the construction of political knowledge scales, vastly increase the reliability of the resulting measurements. Question format alone explains up to one third of the variation in measurement reliability, skewness and kurtosis explain roughly half of the same variation, modeled under the linear assumption, and other attributes considered in the chapter account for about a quarter of the variation in reliability. Of course, some of these effects overlap, yet when all the variables are included in the model specification they collectively account for three fourths of the variation of Alpha. Furthermore, we cannot exclude the possibility of a non-linear relationship between

the variables of interest; thus, it is conceivable that the current findings in fact underestimate real effects. This renders the reported tests conservative with regard to the main research questions formulated throughout the chapter.

The most apparent contribution is that it sheds light on important issues regarding the measurement and scaling of political knowledge. The reported findings cast doubt on the accuracy of all null results in the study of information effects to the extent that their underlying measurements are affected by imperfect reliability and validity; at the same time, substantively trivial findings in the literature may have been induced by measurement error as well.

The practical implications of these results are also worth noting. Commercial pollsters are well aware of the increased costs of open-ended items, and the estimated gain in reliability is not likely to be persuasive in light of more stringent financial considerations. Much of the coders' time and efforts that elevate costs, however, can be circumvented by means of automated coding and proper questionnaire design (see DeBell, 2013, for a detailed account of how open-ended questions can be improved). The script used for recoding open-ended responses into binary ones can either search for markers of correct answers (a certain character at a given distance from another), recode ranges of responses in bulk (can be applied to items where the correct response is a number) or check the degree of similarity between the case insensitive response entries and the items on a predefined list of plausible answers. More importantly, the expected coding efforts should not be overlooked at the questionnaire design phase. The lower the reliability of a measurement, the more items will be needed to grasp an empirically real effect. What one can conclude based on the results is that the same reliability can be achieved with fewer items and smaller sample sizes if the right decisions are made at the survey design stage of any research endeavor.

The conclusion that name or office recognition items outperform other types of items in terms of reliability is particularly reassuring. Not only that the use of such items bears no consequences on

polling costs, but the design and coding of such items can be easier than that of other types of items, mainly due to the relative brevity of the answers they require, which greatly reduces the coding effort for open-ended items. Provided that the difficulty of name or office recognition items is not contingent upon the partisanship of the respondents, the use of such items may increase the reliability of political knowledge scales enough to allow for the estimation of weak information effects that have previously been eluded by measurement noise.

Finally, all scientific findings are by nature tentative, and the results presented in this chapter can hardly constitute an exception. The sample of knowledge items and election studies included in the study is limited, albeit rather generous considering the relative scarcity of existing data relevant for the research questions advanced in this chapter. Consequently, a comprehensive categorization of the technical attributes of items could not be performed, and it is possible that the reported results are driven by confounding factors unaccounted for. Several other limitations may emerge from the specific methodologies employed throughout the analysis, as every method comes with particular assumptions whose aptness often cannot be established beyond reasonable doubt. To mention a few, multiple parametric coefficients have been used throughout the chapter (Cronbach's Alpha, correlation coefficients, F tests, etc.), all of which have specific distributional assumptions. Further, many of our variables of interest were assumed continuous, despite some of them having a limited range of possible values (educational attainment or income, for instance) or being naturally bounded on one or on both sides of their distributions. Also worth noting is that the concept of political knowledge was assumed unidimensional throughout the chapter, following Delli Carpini and Keeter's (1993) conclusions and Kroh's (2009) recommendation on CSES data. Several of these assumptions will be addressed in the following chapters, where other methods of estimating information effects are introduced.

CHAPTER 3: A SIMULATION STUDY ASSESSING THE IMPACT OF RELIABILITY ON THE MAGNITUDE OF INFORMATION EFFECTS

This chapter elaborates the findings of Chapter 2 by testing whether the reliability of political knowledge measurements have an impact on the size of information effects estimated with simulation models similar to the ones routinely reported in the literature in the field after Bartels (1996), Delli Carpini and Keeter (1996) and Althaus (1998). I start with regressing the trait of interest – turnout to vote, satisfaction with democracy, political efficacy – on demographics, political knowledge and all the possible two-way interactions with knowledge. Subsequently, the expected value of the outcome variable is computed and subtracted from the same statistic under conditions of maximum political knowledge for every respondent – when all respondents are assumed to be fully informed. The predicted values generated by these models are the best estimates to date (Bartels, 1996; Althaus, 1998) for the net impact of knowledge on behavior and attitudes. The estimates are bootstrapped to reflect the empirical distribution of information effects, and regressed on indicators of the internal consistency of the measurements of political knowledge that generated them. The analyses are performed on a country by country basis using data from the Comparative Study of Electoral Systems (CSES), modules 1, 2 and 3. The findings show that simulation models are far more robust than correlational or linear regression studies to departures from measurement reliability; while there is considerable variation in the magnitude of information effects across election studies, the reliability of the political knowledge measurement is not among the factors that affect it.

3.1. Introduction

Political knowledge is one of the most widely used constructs in political science, and it is central to an increasingly eclectic range of theories within the various subfields of political psychology, voting behavior and political communication (Pietryka and MacIntosh, 2013). Its oldest and most cited use is in comparative politics (see, for instance, Berelson, 1954), where it was found to be a significant predictor of numerous political outcomes such as vote choice (Bartels, 1996), turnout (Neuman, 1986; Fisher et al., 2008), policy attitudes (Althaus, 1998), political efficacy (Lauglo, 2011; Schultz et al., 2013), support for democratic practices (Galston, 2001) and many more. There is abundant evidence supporting the claim that political knowledge influences political behaviors and attitudes, coming from correlational or regression studies on observational data and from various experimental designs. There are, nevertheless, surprising discrepancies in the degree of success of the analyses published to date on the effects of knowledge, and it has been previously argued that certain differences in the approach to the measurement of political knowledge may in fact underlie some of the variation in its reported effects (Gibson and Caldeira, 2009; Prior and Lupia, 2008, DeBell, 2013).

I have previously shown that the reliability of political knowledge measurements can be improved with practices as simple as replacing closed-ended questions with open-ended ones, or altering the shape of the distribution of the political knowledge variable. As illustrated at the end of the previous chapter, these technical decisions can reduce the bias of the estimates of information effects obtained from correlational studies, and reveal effects that would otherwise be indistinguishable from zero. In this chapter I extend the scope of the same exercise by including more elaborate modeling techniques for computing information effects, and assessing their sensitivity to the measurement noise of the political knowledge scale. To this end, following Bartels (1996), Delli Carpini and Keeter (1996), Althaus (1998), and Toka (2008) I simulate aggregate and individual level predicted values on four dependent variables for hypothetical constituencies that are alternatively fully informed and fully

uninformed, using regression models where political knowledge, socio-economic variables, and all two-way interactions with knowledge are used as predictors. The net effect of political knowledge on the dependent variables is given by the difference between the fully informed and the fully uninformed predicted values, and its statistical significance is established by generating the empirical distribution of the estimate over 1,000 resamples with replacement, and testing it against the null hypothesis of no effect. Finally, I correlate the magnitude of information effects with indicators of measurement reliability. For this stage of the analysis three indicators of reliability were used (Cronbach's α , polychoric α , and Loevinger's H), and their impact on information effects was tested in a within-polity and across-polity fashion. Finally, I use fictitious data to estimate the differential robustness to measurement error for various operationalizations of information effects.

All the analyses were performed on the three modules of the Comparative Study of Electoral Systems (CSES 1, 2 and 3). All election studies were included in the study, with the exception of those who had incomplete data for the variables of interest. My results show that the impact of measurement noise on the magnitude of information effects is contingent upon the generation method of the latter; certain methodological decisions made in this chapter have successfully mitigated the impact of measurement noise on the estimates of interest.

3.2. Theoretical Background

The scholarly interest in the relevance of political literacy is as old as democracy, and the consensus in the earlier theories (prior to the advent of inferential statistics) was that democracy cannot function without a cognitively engaged populace who actively monitors and sanctions the performance of their representatives. The advent and development of statistical models to test this prediction led to a rapid diversification of the hypotheses concerning the effects of political knowledge, and as automated

computing replaced human brainpower in virtually all computational tasks, ever more ingenious ways of tapping into the phenomenon started to surface.

As the measurement of political knowledge was discussed previously, in this chapter I move on to analyze the extent to which the quality of the measurement of knowledge affects the results of studies similar to the ones that constitute the norm in present day political knowledge scholarship. Most observational studies (for example Bennet, 2002; or Prior, 2005) and virtually all experimental design studies (see, for instance, Fishkin and Luskin, 1999; or Lau and Redlawsk, 1997) draw their insights from models that estimate one or two political knowledge parameters (typically a main effect and a joint effect); the conclusions drawn from Chapter 2 of this thesis likely apply to all these studies: the lower the reliability of the measurement of political knowledge, the smaller the magnitude of the information effects. However, some of the most influential works in the field (Bartels, 1996; Delli Carpini and Keeter, 1996; Althaus, 1998) employ simulation models where political knowledge is interacted with every other term in the regression equation, and the point estimates are bootstrapped to approximate an empirical distribution thus making it unclear whether the insights drawn for correlational studies should hold for such models.

Bartels' seminal work on information effects (1996) pursues the rather ambitious goal of establishing whether a uniform increase in political knowledge among the American electorate would significantly affect the election fortunes of the two major American parties. The most innovative aspect of his work does not lie in the research question, though, but in the way he chooses to address it. He acknowledges that the mechanisms through which political knowledge may affect people's behaviors and attitudes are by no means established; in addition to the direct effect that political knowledge may have on the outcome, there are multiple interactions between knowledge and other characteristics of the respondents that are theoretically justified or justifiable. As the pool of socio-economic effects on vote choice that could be moderated by political knowledge is virtually inexhaustible, Bartels decided to

include in his model interactions between political knowledge and all the socio-economic variables in the specification with little or no further theoretical consideration. This approach to modeling information effects returns slopes and standard errors that are hardly interpretable due to several regression assumptions being violated. However, the only statistic retrieved from the fitted model is the mean expected value of the vote choice variable, that is computed both for the original sample and for an “enlightened” (Bartels, 1996; Delli Carpini and Keeter, 1996; Althaus, 1998) electorate, which is identical to the original sample in all respects except that all the scores on the political knowledge variable are replaced with higher values. A true expected value and an enlightened one are computed for each individual in the sample using the regression equation fitted to the original data. The magnitude of the information effect is given by the average difference between the “enlightened” and the true preferences of the respondents, and the significance of the statistic is computed by generating its empirical distribution over a large number of subsamples, selected at random from the original sample, with replacement.

Bartels (1996) used a logit link function in his models; Delli Carpini and Keeter (1996), and Althaus (1998) independently developed essentially the same method for estimating net effects of political knowledge on other outcomes, using other link functions as well as ordinary least squares regression. The validity of the results of such simulation models is satisfactory (Gilens, 2001; Sturgis, 2003), fully consistent if not identical to experimental results that are unconstrained by the availability of data (Sturgis, 2003). Nevertheless, the method is certainly not sheltered from the criticism surrounding simulation models in general. Most notably, extrapolation (King and Zeng, 2007) is a fairly common practice that refers to the computation of predicted responses for hypothetical subjects with eccentric scores on the treatment variable – political knowledge in this case – or even for scores outside the observed range of the treatment variable. This practice is fueled by the unstated yet potentially erroneous assumption that the models generating the parameters used for the computation of

simulated outcomes are virtually the same regardless of the range of the data they are fitted to. As all simulated outcomes are model-dependent (King and Zeng, 2007), extrapolation often leads to biased estimates. Arguably, these pitfalls can be avoided either by adopting the more conservative approach of estimating simulated effects for plausible ranges of the treatment variable, for instance $x \pm \frac{1}{2} \text{SD}$, or by using short scales for the treatment variable, where the extreme values are observed at considerable frequencies. This latter solution is the one employed for this chapter.

The impact of measurement error was mostly studied in the context of simulations in the econometric and biometric literature. Formal and empirical tests tend to agree that the effects of error contamination are mostly apparent in lower-order statistics such as means and variances, but they tend to fade gradually for higher-order ones (Chesher, 1991) without ever disappearing. Furthermore, bootstrapping has been previously proposed as part of methods for correcting for errors that stem from the amount of noise in covariates (Haukka, 1995), as the values in the empirical distributions of estimates incorporate the random noise components of the observable variables. Other methods include the addition of noise to error ridden covariates to shed light on its effect on the parameters of interest, based on the notion that not all errors are created equal and their impact can vary not only in size but also in direction (Carroll, 1998). The most cited and discussed effect of random noise on parameter estimates remains the attenuation of slopes, or regression dilution (Meijer and Wansbeek, 2000), which is a mathematical consequence of the flat, overdispersed distributions of unreliable variables as well as the escalation of standard errors around the slopes of noisy covariates. As the reliability of a variable decreases beyond a certain threshold, its effects fade into insignificance. In multivariate regression, this translates into an attenuated slope for the noisy covariate, but the slopes of other variables in the model specification may even be augmented due to the decrease in collinearity between the noisy variable and other nonorthogonal explanatory variables (Carroll, 1998). Predicted values are contingent upon the sizes of all the slopes estimated with a given model. While the noise in one covariate will bias

predicted outcomes towards zero, its effects on other parameter estimates may even reduce the bias.

The inefficiency of error contaminated data is illustrated in the analyses summarized at the end of the previous chapter, where reliability statistics were found to be good predictors of the association between the noisy measure of political knowledge and its common covariates. To what extent reliability affects the results from simulation models such as the ones described previously in this section is an empirical question the results of which can serve as guide for good practice in subsequent research.

3.3. Methodology

The analysis proceeds in several steps. Following Bartels' (1996), Althaus' (1998), Deli Carpini and Keeter's (1996) approach to testing the enlightened constituency hypothesis, a joint effects model is specified, whereby the outcome of interest is regressed on socio-economic indicators, political knowledge, and all the two-way interactions between political knowledge and the other variables in the specification. I used the following models for estimating the net impact of political knowledge on turnout, political efficacy and citizens' evaluation of democracy in their country:

$$P(\textit{Turnout}=1)=\alpha+\beta_1 K_i+\sum \beta_j V_{ij}+\sum \delta_j(V_{ij}*K_i)+\varepsilon_i \quad (1)$$

$$\textit{Satisfaction with democracy}=\alpha+\beta_1 K_i+\sum \beta_j V_{ij}+\sum \delta_j(V_{ij}*K_i)+\varepsilon_i \quad (2)$$

$$\textit{Internal political efficacy}=\alpha+\beta_1 K_i+\sum \beta_j V_{ij}+\sum \delta_j(V_{ij}*K_i)+\varepsilon_i \quad (3)$$

$$\textit{External political efficacy}=\alpha+\beta_1 K_i+\sum \beta_j V_{ij}+\sum \delta_j(V_{ij}*K_i)+\varepsilon_i \quad (4)$$

where K_i is the level of political knowledge for respondent i ; V_{ij} is respondent i 's score on the j^{th} socio-economic variable V ; α , β and δ are parameter estimates and ε_i is the prediction error for respondent i . While (2), (3) and (4) are multivariate OLS models, (1) is a logistic regression model with outcome $Y=0$ for non-voters and $Y=1$ for respondents who reported having voted in the most recent election.

From each model there are at least two statistics of interest that are to be retrieved: the expected outcome under conditions of minimum, respectively maximum level of political knowledge for all respondents. The two statistics are computed by substituting the actual political knowledge scores of the respondents with the minimum, respectively the maximum score allowed on the scale, and generating predicted values for the dependent variables using the equations found for the real data. The difference between the latter and the former represents the net effect of political knowledge on the dependent variable. For instance, for the following hypothetical regression equation:

$$Y = \alpha + \beta_1 K + \beta_2 V + \delta_1 V * K + \varepsilon; K \in [0, 3] \quad (5)$$

The maximum information effect for respondent i is given by the equation:

$$\Delta Y_i = (\alpha + 3 * \beta_1 + \beta_2 V_i + 3 * \delta_1 V_i) - (\alpha + \beta_2 V_i) = 3 (\beta_1 + \delta_1 * V_i) \quad (6)$$

or, in general form:

$$\Delta Y_i = \max(K) * (\beta_1 + \sum \delta_j V_{ji}) \quad (7)$$

These statistics are, however, point estimates whose degree of uncertainty is unknown; the fit of the models that generated them cannot be used to infer their robustness, as they are likely biased due to violations of the distributional assumptions of regression – most notably collinearity, homoskedasticity and joint normality (Fox, 1984). Nevertheless, the empirical distribution of the statistics can be generated by random sampling with replacement from the respondents of the full data and running the same model on all resamples. I thus ran all models on 1,000 resamples of size $n-1$, with replacement, for each of the election studies in CSES 1, 2 and 3, computing the relevant statistics for each resample

and generating their empirical distribution from which confidence intervals can subsequently be estimated. In addition to net effects of political knowledge, I also computed reliability estimates (alpha, polychoric alpha and H, as discussed in Chapter 2) for the political knowledge scale used in each resample, and recorded their dispersion across the samples selected in each election study.

Finally, for every polity in the three modules of CSES, I correlated the reliability estimates with the size of information effects. Correlations are reported by polity in Table 3.2, Table 3.3 and Table 3.4, between the three reliability measures and the size of each of the following information effects:

1. *Turnout*. In most countries included in the CSES, a majority of citizens turnout to vote in national elections. In addition, social desirability and memory effects on self-reported turnout render the distribution of declared turnout markedly unbalanced, with few cases admitting to abstention. Consequently, for almost every respondent in the majority of election studies, the logistic regression model (1) predicts a higher than 0.5 probability to vote. However, the average predicted probability of a vote across all respondents from a sample closely resembles the distribution of 1s and 0s in the self-reported turnout variable. Based on this, I computed the turnout predicted by the model as well as the turnout under conditions of maximum and minimum knowledge. The following variables were constructed using this rationale:
 - a) The difference between the simulated “enlightened” turnout and the actual turnout predicted by the model – “Regular” in Table 3.1
 - b) The difference between the simulated “enlightened” turnout and the simulated turnout when knowledge is set to minimum for all respondents – “Maximum” in Table 3.1
2. *Attitude towards democracy*. The variable is measured with a *Likert* scale recording the respondents' satisfaction with how democracy works in their country. The information effects estimated for this outcome are the following:

- a) The simulated net change for the median satisfaction with democracy upon an increase in political knowledge from minimum to maximum for all respondents – “Overall” in Table 3.1
 - b) The proportion of respondents who, upon a simulated increase in political knowledge from minimum to maximum, would pass the threshold from dissatisfaction to satisfaction with the way democracy works – “0 → 1” in Table 3.1
 - c) The proportion of respondents who, upon a simulated increase in knowledge from minimum to maximum, would pass the threshold from satisfaction to dissatisfaction – “1 → 0” in Table 3.1
3. *External efficacy*. The variable records the respondents' belief whether who is in power makes a difference. The information effects computed for this variable are analogous to the ones for satisfaction with democracy:
- a) The simulated net change for the median level of efficacy upon an increase of knowledge from minimum to maximum – “Overall” in Table 3.1
 - b) The proportion of respondents who, upon an increase in knowledge from minimum to maximum, would pass the neutral point (the midpoint of the scale) from inefficacious to efficacious – “0 → 1” in Table 3.1
 - c) the proportion of respondents who, upon an increase in knowledge from minimum to maximum, would pass the neutral point from efficacious to inefficacious
4. *Internal efficacy*. This variable is based on the question whether the respondents believe that what people vote for can make a difference. It is scaled the same as the external efficacy variable described above, and the information effects computed for this variable are the same as the ones for the previous one.

The standard deviation of each information effect is recorded alongside the statistic, so that significance tests can be performed. Table 3.1 below summarizes the results from this stage of the analysis.

Table 3.1: Information Effects by Polity – part 1

Polity	Turnout		Satisfaction w. democracy			External political efficacy			Internal political efficacy		
	Regular	Maximum	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0
Canada 97	4.01*	10.47*	4.24	6.51	0	4.85*	11.50	2.71	5.45*	4.06	0.08
Taiwan 96	2.73*	8.82*	-7.67	14.35*	27.5*	1.6	21.52*	5.59	1.17	7.5	0.16
Czech Rep 96	1.79*	25.02*	5.51	39.8*	16.31*	13.2*	7.00	0	23.22*	37.27*	0
Germany 98	6.78*	14.43*	9.90*	33.11*	2.96	6.43*	2.57	0.01	3.83	0.04	0
Hong Kong 98	9.86*	30.26*	-4.38	7.39	5.58	10.54*	9.72	0.53	7.07	32.05*	7.38
Hungary 98	18.46*	32.34*	10.53*	38.97*	1.37	12.97*	1.00	0	16.68*	0.45	0
Israel 96	-9	20.19	8.62	39.36*	23.29*	7.38	19.00	2.31	5.88	10.74	0.17
Mexico 00	-0.4	2.1	0.73	9.61	6.84	2.39	0.53	0.06	1.75	0.04	0
Norway 97	2.79	9.98*	5.06*	0	0	3.26	0	0	0.62	0.07	0
Poland 97	11.86*	25.69*	11.93*	5.58	1.01	4.09	0.05	0	13.25*	27.37*	0.03
Portugal 02	11.27*	23.63*	-4.19	29.12*	38.93*	15.75*	21.48*	1.31	12.26*	7.04	2.36
Romania 96	0.8	24.67*	0.92	32.62*	36.66*	-0.28	3.57	0	18.81*	15.84	0
Spain 96	1	5.46	1.03	18.35*	8.69	6.45	0.80	0.01	0.76	1.07	0.15
Sweden 98	6.55*	18.17*	16.13*	33.20*	1.14	7.26*	1.35	0	6.42*	0.58	0
Ukraine 98	2.87	19.17*	-4.99	0	9.07	4.19	1.35	0	1.33	27.94*	12.32
UK 97	5.04*	14.74*	5.56*	9.54*	0.39	8.69*	2.84	0	7.65*	0.83	0
US 96	11.24*	26.61*	12.74*	2.91	0.01	6.69	5.10	0.39	14.16*	4.56	0.06
Albania 05	0	2.77	-4.17	6.24	7.77	25.71*	17.71*	0.01	13.58*	1.50	0
Brazil 02	2.95*	7.25*	-6.37*	0.59	9.14*	5.42*	0	0	0.84	0	0.01
Czech Rep 02	6.08*	22.62*	2.12	21.02*	18.66*	10.83*	29.07*	1.27	11.12*	45.77*	4.45
Finland 03	6.61*	31.42*	11.13*	50.62*	0.67	7.41	27.71*	0.15	5.59	23.04*	0.40
Germany 02	3.00*	6.04*	8.5*	52.59*	4.23	3.18	28.80*	14.02*	5.36*	17.08*	5.30
Hong Kong 04	7.58*	22.37*	-5.05	20.14*	41.24*	5.58	24.19*	9.25	1.59	11.49	11.12
Hungary 02	13.02*	25.74*	6.10	43.62*	9.08	23.66*	0.36	0	19.10*	0.14	0
Israel 03	0.17	10.15	3.42	25.39*	22.85*	12.72*	18.40*	0.05	10.57	4.54	0.02
Italy 06	2.92	13.90*	2.81	6.83	15.76*	8.92	28.67*	2.12	-3.66	4.24	1.38
Japan 04	2.64	5.77*	-4.48	4.04	31.05*	8.27*	14.17*	2.14	8.29*	17.13*	1.93
Mexico 03	3.60*	10.27*	2.97	2.06	0.88	4.48	28.55*	2.39	11.39*	15.77	0.03
N. Zealand 02	3.60*	9.29*	2.02	15.85*	8.87	8.70	9.66	0.41	10.42*	2.49	0.01
Philippines 04	3.29*	8.71*	2.79	40.83*	29.53*	2.98	36.11*	23.85*	7.14*	15.52	6.27
Poland 01	8.16*	33.43*	10.38*	13.55*	2.37	0.39	7.82	0.05	10.15*	49.95*	1.66
Portugal 02	8.64*	19.71*	-3.13	29.4*	35.68*	15.75*	21.17*	1.26	11.81*	6.60	2.40
Portugal 05	7.86*	24.97*	5.07*	20.35*	5.99	12.98*	16.43	0.06	5.15	0.15	0
Romania 04	4.42*	13.30*	0.13	28.95*	29.94*	13.15*	3.33	0.01	10.85*	2.54	0.03

“Turnout”, and all “0 → 1” and “1 → 0” values are presented as percentages. The other variables are on a 0-100 scale

Table 3.1: Information Effects by Polity – part 2

Polity	Turnout		Satisfaction democracy			with External political efficacy			Internal political efficacy		
	Regular	Maximum	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0
Russia 04	5.54*	18.32*	0.20	8.71	12.11	5.22	0.02	0	-4.87	15.55	27.93*
Slovenia 04	4.04	9.52	-1.87	18.51	30.33*	1.24	1.62	1.53	8.65*	3.31	0.16
Spain 04	5.97*	15.36*	-4.30	2.00	5.12	4.61	0.39	0.02	4.82	0.34	0.01
UK 05	13.77*	26.49*	4.32	18.65*	3.37	16.04*	60.51*	4.07	5.61	18.74*	5.01
US 04	9.84*	28.25*	11.13*	11.21	2.50	18.53*	7.71	0	12.40*	3.82	0.01
Austria 08	1.04	10.97	-13.66*	1.39	16.84*	10.44*	11.36	0	8.25	8.16	0
Croatia 06	4.71*	13.83*	10.56*	2.77	0.48	22.63*	36.61*	0.42	15.57*	39.49*	0.93
Czech Rep 06	9.83*	25.29*	6.70*	39.07*	4.93	17.56*	13.02*	0	17.68*	24.09*	0
Estonia 11	5.30*	17.71*	12.95*	56.86*	2.25	9.61*	6.36	0.03	16.61*	25.45*	0.21
Finland 07	6.29*	24.29*	8.55*	29.98*	0.27	7.42*	6.12	0	8.59*	4.83	0
France 07	1.48	8.24*	3.63	26.05*	4.77	10.31*	32.15*	0.36	4.77	0.27	0
Germany 09	11.46*	27.27*	8.81*	29.23*	2.20	28.63*	55.44*	0	27.23*	46.25*	0
Greece 09	3.36*	9.92*	3.90	2.57	0.22	14.65*	47.71*	5.5	16.31*	45.19*	1.13
Hong Kong 08	2.81	10.34	-3.82	21.22*	34.54*	8.07	29.90*	5.66	1.77	21.31*	21.28*
Iceland 07	3.81	5.69	12.64*	43.49*	14.11	10.19*	6.59	0.52	11.00	9.87	2.94
Iceland 09	2.88*	12.90*	5.13	21.07*	6.80	5.54	3.61	0.08	6.17	8.53	0.08
Japan 07	1.94	6.55	4.63	42.97*	12.68	9.26*	34.19*	9.84	9.93*	9.22	3.46
Korea 08	5.39*	25.93*	2.60	23.42*	29.80*	11.26	31.06*	0.55	17.93*	34.80*	0.09
Mexico 06	3.08*	9.39*	10.11*	46.11*	6.44	-2.29	3.18	0.25	3.74	2.09	0
Mexico 09	5.34*	18.29*	6.89*	30.94*	5.91	12.41*	2.29	0	11.36*	0.58	0
Netherlands 06	4.33*	14.23*	8.10*	6.52	0.05	5.42*	0.64	0	4.60*	0	0
N. Zealand 08	-9.49	18.89	-0.23	20.23*	18.51*	-1.61	4.72	0.44	-0.92	1.93	0.02
Poland 07	6.62*	22.49*	1.06	31.13*	16.39*	7.38*	4.45	0.05	11.94*	29.73*	0.58
Portugal 09	2.91	22.23*	1.76	16.60*	24.16*	-10.54	18.52*	18.57*	-2.53	2.82	1.43
Slovakia 10	5.45*	12.49*	1.13	10.36	13.50	1.66	0.38	0.11	7.34	2.00	0.08
Sweden 06	-2.74	2.74	0.64	5.78	0.23	3.07	1.06	0.40	1.05	0.41	0.09
Thailand 07	-1.75	-1.49	-4.91	0.01	7.9	0.48	3.41	20.64*	2.78	18.61*	18.65*

“Turnout”, and all “0 → 1” and “1 → 0” values are presented as percentages. The other variables are on a 0-100 scale.

Significance threshold: 0.05 (two-tailed)

It is apparent from the outset that the size and variance of the information effects vary considerably across election studies, ranging from surprisingly strong (over 50% of the respondents change their behavior upon a maximum increase in knowledge in some polities such as Estonia, 2011 and Germany, 2002 for “support for democracy”, or Germany, 2009 and UK, 2005 for “external political efficacy”) to weak or absent altogether (Mexico, 2000 and Sweden, 2006 are the two election studies where no significant information effect was found). Whether the reliability of the measurement of political knowledge can account for the variance within polities or across polities is an empirical question that I seek to address further.

3.4. Reliability

As seen in the previous chapter, the association between political knowledge and its common covariates is often depressed by the unreliability or internal inconsistency of the scale used in the measurement of knowledge. However, the approach in simulation studies like the one presented here diverges significantly from the approach of correlational or linear regression studies, and some of the differences can be indeed consequential. In correlational studies, the noise in the measurement of political knowledge is directly responsible for the size of the prediction error, as the predicted values are obtained by a linear function of the values in the political knowledge variable alone. In multivariate regression and joint effects models, such as the ones used in this chapter, the noise in the measurement of political knowledge affects the individual error term for each parameter in the regression equation. As errors can be both positive and negative and can cancel each other out, the predicted values generated with interactive models may be less sensitive to unreliable measurements. The reliability tests presented in this chapter offer an empirical assessment of these assertions.

Table 3.2: Significant Correlations Between α Reliability and Information Effects

Turnout		Satisfaction with demo			External pol. efficacy			Internal pol. efficacy		
Regular	Max.	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0
US 04	ES 96	CZ 02	HK 08 (-)	CZ 02 (-)	HK 98 (-)	KR 04 (-)	SE 06 (-)	FR 07	PL 07	GB 05
PL 97	US 96	HR 07 (-)	HR 08	HK 08	PL 07	PH 04	TW 06	GB 05 (-)	NZ 02	SE 06
ES 96	MX 06	IL 96 (-)	IL 96 (-)	HU 02 (-)	PH04	IT 06	(-)	PT 07 (-)	CZ 02	NZ 02
FI 97	(-)	HK 08	EE 11	NZ 02	KR 04 (-)	HK 98 (-)	PH 04 (-)	GR 09	HK 04 (-)	PT 02
US 96	PL 97	EE 11	CZ 02	US 96	BR 02	MX 09	PT 05	DE 02	PT 05 (-)	CZ 06(-)
HK 98	GB 05	SE 98	HK 04 (-)	HU 98 (-)	IT 06	HU 98	SI 04 (-)	KR 04	IS 07 (-)	HK 08
CZ 06	IS 09 (-)	RO 04	JP 04 (-)	IS 07 (-)	MX 06	GR 09	CA 97 (-)	US 04	US 04 (-)	EE 11
UK 95	MX 03		SE 06	SK 10 (-)	(-)	JP 04 (-)	RO 04 (-)	TW 96	SE 06 (-)	PT 09 (-)
HK 04	SE 98 (-)		TW 96	SI (04)	MX 03	IL 03 (-)	IS 09 (-)	HU 02 (-)	DE 02 (-)	
BR 02	NO 97 (-)		(-)	RO 04 (-)	(-)	MX 03		PH 04 (-)		
PL 07	CZ 06		RO 96 (-)	EE 11 (-)	HR 07 (-)			SI 04 (-)		
CZ 02	ES 04 (-)				IS 07 (-)					
RO 96	BR 02				US 96					
RO 04					IS 03 (-)					
SK 10					UA 98 (-)					
HU 02					PT 02					
NO 97 (-)										
GB 97										

Significance threshold: $p=0.05$; the sign of the correlation is shown in parentheses

Table 3.3: Significant Correlations Between Polychoric α Reliability and Information Effects

Turnout		Satisfaction with demo			External pol. efficacy			Internal pol. efficacy		
Regular	Max.	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0
ES 96	ES 96	CZ 02	HK 08 (-)	CZ 02 (-)	KR 04 (-)	KR 04 (-)	SE 06 (-)	GB 05 (-)	US 04 (-)	GB 05 (-)
FI 07	KR 08 (-)	HK 08 (-)	IL 96(-)	HK 08	PL 07	IL 03 (-)	TW 96	FR 07	PL 07	SE 06 (-)
HK 98	MX 03	IL 96 (-)	CZ 02	SI 04	PH 04	PH 04	(-)	US 04	NZ 02 (-)	NZ 02 (-)
PL 97	PL 97	US 96 (-)	HR 07	NZ 02 (-)	HK 98 (-)	HU 98	PH 04 (-)	SI 04 (-)	PT 05 (-)	HK 08 (-)
CZ 06	HK 98,	EE 11	EE 11	KR 04 (-)	BR 02	IT 06	PT 05	SE 06 (-)	CZ 02	CZ 06
BR 02	ES 04(-)	SE, 98	HK 04(-)	IS 07 (-)	IL 03 (-)	JP 04 (-)	SI 04 (-)	GR 09	IS 07 (-)	PT 09
RO 04	UK 05,	US 04	SE 06	RO 04 (-)	IT 06	MX 09		HU 02 (-)	HK 04 (-)	
HK 04	RO 04	RO 04	JP 04 (-)		MX 06	GR 09		DE 02	SK 10 (-)	
GB 05	BR 02		IT 06 (-)		(-)			PH 04		
RO 96			DE 09 (-)		PT 02			PL 07 (-)		
HU 02			RO 96(-)		MX 03					
US 04			TW 96		US 96					
SK 10			(-)							
MX 03			CA 97 (-)							

Significance threshold: $p=0.05$; the sign of the correlation is shown in parentheses

Table 3.4: Significant Correlations Between Loewinger's H Consistency and Information Effects

Turnout		Satisfaction with demo			External pol. efficacy			Internal pol. efficacy		
Regular	Max.	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0	Overall	0 → 1	1 → 0
ES 96	ES 96	CZ 02	HK 08 (-)	CZ 02 (-)	PL 07	PH 04	PT 05	GB 05 (-)	CZ 02	GB 05 (-)
FI 07	KR 08 (-)	HK 08 (-)	IL 96(-)	HK 08	HK 98 (-)	IS 09	CA 07 (-)	HU 02 (-)	NZ 02 (-)	CZ 06
HK 98	MX 03	IL 96 (-)	IT 06 (-)	SI 04	BR 02	IT 06	PH 04 (-)	SI 04 (-)	IS 09	NZ 02 (-)
PL 97	PL 97	US 96 (-)	CZ 02	NZ 02 (-)	PH 04	IL 03 (-)	SE 06 (-)	FR 07	IS 07 (-)	HK 08 (-)
CZ 06	HK 98	EE 11	HR 07	IS 07 (-)	IT 06	HU 98	TW 96	PL 07 (-)	HK 04 (-)	
BR 02	GB 05	PT 02	EE 11		IL 03 (-)	HK 98 (-)	(-)	SE 06 (-)	PT 05 (-)	
RO 04	BR 02	HR 07	HK 04(-)		MX 03	JP 04 (-)	TH 07	IS 07	PL 07	
HK 04	NO 07	SE, 98	JP 04 (-)		MX 06	MX 09	SI 04 (-)	CZ 02 (-)	PT 02	
GB 05	AT 08	IT 06	RO 96(-)						SK 10 (-)	
RO 96									CZ 96 (-)	
HU 02										
SK 10										
MX 03										

Significance threshold: p=0.05; the sign of the correlation is shown in parentheses

Neither Cronbach's Alpha, nor Loewinger's H or polychoric alpha appear to be responsible for the size of information effects. There are more significant correlations than chance would predict (30 percent of all coefficients estimated for the impact of alpha on turnout information effects came out significant), but they are in the range of 0.05 and 0.2, they are thus substantively trivial. The results do not bring any support for the conclusions of the previous chapter, thus suggesting that certain methodological decisions made in this chapter have successfully mitigated the impact of measurement noise on the estimates of interest. A meta-analysis of all the significance tests¹¹ whose results are summarized in Table 3.2, Table 3.3 and Table 3.4 shows that the correlation between reliability and the information effect on turnout is significantly different from zero, but reliability accounts for a dismal 1 percent of variation in the size of the information effect, thus rendering the finding trivial at best.

Although the computation of information effects may reduce the type II errors associated with low measurement reliability, it is conceivable that the noise in the measurement of each of the interaction terms in the specification would be reflected in the model fit of each model used in the simulations. To test this conjecture, I regressed the R² statistic of the model run for each resample on

¹¹ Fisher's method was used in the meta-analysis, as described in Kost and McDermott (2002)

the reliability of the measurement of political knowledge, and compared the standardized coefficients found for each polity with the prediction of the null hypothesis ($\beta=0$). Using Fisher's method for combining p-values from repeated tests (Kost and McDermott, 2002), I concluded that the average polity does not display evidence of reliability effects on model fit. In fact, all but a few (14/186) reliability effects were statistically insignificant, and the ones that differed statistically from 0 only accounted for up to 1 percent of the variance in model fit. Once again, I am compelled to concede that there is no evidence supporting the notion that the reliability of knowledge scales would account for much of the variance in the statistics considered in this chapter.

While reliability does not account for any notable amount of variance in the size of information effects across resamples from the average election study sample, it may be responsible for the variation in information effects across election studies. The two approaches differ sensibly as the variability of the reliability estimate is generated by the random sampling of respondents alone in the case of the former, and in the case of the latter the selection of knowledge items underlies the variation in reliability (a different set of items was used in each polity). By averaging the reliability scores within each election study and correlating the result with the point estimate of each information effect, I could illustrate the relationship between reliability and the size of information effects on a cross-election basis. Table 3.5 below summarizes the results of this stage of the analysis.

Table 3.5: Cross-Country Correlations Between Reliability and Information Effects

	Cronbach's α	Polychoric α	Loevinger's H
Turnout: regular	-0.07	0.00	0.08
Turnout: max	-0.30*	-0.22	-0.16
Satisfaction with democracy: overall	-0.17*	-0.14	-0.07
Satisfaction with democracy: 0 \rightarrow 1	-0.07	-0.17	-0.22
Satisfaction with democracy: 1 \rightarrow 0	0.16	0.12	0.07
External efficacy: overall	-0.07	-0.03	0.05
External efficacy: 0 \rightarrow 1	-0.23	-0.19	0.08
External efficacy: 1 \rightarrow 0	0.09	0.05	-0.17
Internal efficacy: overall	-0.01	-0.06	-0.03
Internal efficacy: 0 \rightarrow 1	-0.15	-0.16	-0.18
Internal efficacy: 1 \rightarrow 0	-0.00	-0.01	-0.00

Significance threshold: $p=0.05$; $df=60$

The correlation coefficients are not significantly different from 0 overall; out of 33 estimates only two are significant, yet their sign is negative, contrary to the theoretical expectations previously advanced. The standard errors of the information effects are also largely unaccounted for by reliability, as shown in Table 3.6 below. The correlations between our three indicators of reliability and the dispersion of the eleven information effects (33 correlations) appear roughly centered around 0; however, as expected, more coefficients are negative (25) than positive (8), and all four significant effects are negative. There are more significant effects than chance would predict (12%), but any degree of methodological conservatism would advise against refuting the null hypothesis on such evidence. At best, reliability may account for 10% of the variation of the standard errors of information effects, yet the most sensible conclusion is that the effect of reliability on the standard errors is null to substantively trivial. This leads to the conclusion that the considerable amount of cross-country variation in information effects, apparent in Table 3.1, is likely driven mostly by factors other than the

reliability of political knowledge, perhaps aggregate-level or institutional characteristics of the political contexts inhabited by our respondents (Lau et al., 2008; Popa, 2013) or other technical properties of the measurements employed that were not discussed in this dissertation. These possibilities will be considered further in the following chapter.

Table 3.6: Correlations Between Reliability and the Standard Errors of Information Effects

	Cronbach's α	Polychoric α	Loevinger's H
Turnout: regular	-0.15	-0.07	-0.11
Turnout: max	0.05	0.04	0.09
Satisfaction with democracy: overall	0.06	-0.01	0.04
Satisfaction with democracy: 0 \rightarrow 1	-0.31*	-0.27*	-0.34*
Satisfaction with democracy: 1 \rightarrow 0	-0.12	-0.13	-0.14
External efficacy: overall	0.00	-0.03	0.01
External efficacy: 0 \rightarrow 1	-0.25*	-0.20	-0.20
External efficacy: 1 \rightarrow 0	-0.07	-0.21	-0.14
Internal efficacy: overall	-0.00	-0.00	0.01
Internal efficacy: 0 \rightarrow 1	-0.14	-0.13	-0.16
Internal efficacy: 1 \rightarrow 0	-0.07	-0.16	-0.05

Significance threshold: $p=0.05$; $df=60$

Before the concluding remarks, it appears sensible to test whether the lack of a reliability effect is indeed a consequence of the modeling procedure or rather a peculiarity of the CSES data used throughout this chapter. To this end, I generate a fictitious database with vectors of length 1,000, with correlational properties similar to what is commonly observed on real data. The correlation matrix below (Table 3.7) summarizes the associations between the vectors:

Table 3.7: Correlation Matrix for Simulated Data

	Knowledge (true)	Knowledge (observed)	Covariate 1	Covariate 2	Covariate 3	Outcome
Knowledge (true)	1					
Knowledge (observed)	0.51	1				
Covariate 1	0.15	0.08	1			
Covariate 2	0.26	0.13	0.54	1		
Covariate 3	0.39	0.18	0.52	0.52	1	
Outcome	0.53	0.26	0.20	0.41	0.41	1

All variables are continuous and unit standardized, no link function was used. The information effects are computed by the same procedure presented previously, with the exception that this time I gradually drop interaction terms from the full regression equation and record the size of the information effect for every step. The full equation contains the error contaminated knowledge variable (V_1), three covariates (C_1, C_2, C_3), as well as all the interactions between V_1 and the covariates, while the simplest equation is a bivariate regression with V_1 as sole predictor of the outcome (O). In addition, I record the standardized slope of knowledge for the models where only the direct effect is specified, as well as the correlation coefficient between knowledge and the outcome (O). Reliability is operationalized as the correlation between the true knowledge scores (V) and the observed ones (V_1), and it is estimated at 0.51 for the full data. The impact of reliability on the estimates of interest is computed using the empirical distribution of all coefficients, generated by 1,000 resamples of length $n-1$, with replacement, from the full data. Table 3.8 below shows the correlation coefficients between reliability and the magnitude of the information effects.

Table 3.8: Impact of Noise on the Magnitude of Various Operationalizations of Information Effects

Input (equation)	No. of parameters	No. of parameters containing V_1	Method	Correlation with reliability
$O \sim V_1 + C_1 + C_2 + C_3 + V_1 * C_1 + V_1 * C_2 + V_1 * C_3$	8	4	Simulated info. effect	0.28*
$O \sim V_1 + C_1 + C_2 + C_3 + V_1 * C_1 + V_1 * C_2$	7	3	Simulated info. effect	0.31*
$O \sim V_1 + C_1 + C_2 + C_3 + V_1 * C_1$	6	2	Simulated info. effect	0.34*
$O \sim V_1 + C_1 + C_2 + C_3$	5	1	Simulated info. effect	0.39*
$O \sim V_1$	2	1	Simulated info. effect	0.46*
$O \sim V_1 + C_1 + C_2 + C_3$	5	1	Multivariate OLS	0.39*
$O \sim V_1$	2	1	Bivariate OLS	0.46*
$r(O, V_1)$	1	1	Correlation	0.50*

All reliability effects are highly significant; however, their magnitude drops monotonically with the increase in the number of parameters estimated with the model. Regression coefficients for knowledge (V_1) are sharply attenuated when the variable is measured with error, but the impact of reliability decreases as more non-independent parameters are included in the specification, potentially as a direct consequence of multicollinearity. The simulated information effects display a similar behavior in response to measurement error contamination, the only criterion that seems to be relevant in determining the impact of noise on the estimates is the number of variables included in the model specification. The bivariate simulation model generates information effects that are equally affected by noise as the slope of knowledge in the simple bivariate regression model, and the slope of knowledge in the multivariate model is affected by reliability as much as the information effect simulated from the same model.

When eight parameters are estimated, the amount of variance in the information effect accounted for by reliability drops below eight percent, roughly half compared to the simulation model without interaction effects or the slope in the multivariate regression model. The naïve estimate of the

information effect underestimates the true information effect (the former is computed with the error contaminated V_1 , the latter with the true knowledge variable V) by an average of 0.33 units when the true information effect is one unit. This may not appear as a negligible difference, yet it is a considerable improvement over the underestimations observed with simpler statistics such as the correlation coefficient, that is as low as 0.26 between the error contaminated V_1 and the outcome O , and as high as 0.53 between V and O . As more parameters are added to the model, these underestimations decrease further.

3.5. Conclusions

This chapter continues the investigation into the impact of measurement reliability on the size of information effects. Using simulation models on data from all polities in the Comparative Study of Electoral Systems, I estimate the net effect of political knowledge on aggregate and individual level turnout, satisfaction with democracy and political efficacy for each election study in the database. While there is considerable cross-country variation in the magnitude and even sign of the information effects found, neither Cronbach's alpha, nor Loevinger's H or polychoric alpha could account for any of the variance observed. As the same data was used in the previous chapter for estimating the impact of reliability on correlations between political knowledge and some of its most cited covariates, we can conclude that it is the methodology employed in this chapter that rendered measurement noise inconsequential.

There are at least two important implications of my findings. Since the reliability of political knowledge measurements is often less than stellar, it appears that a practical way of circumventing the escalation of type II errors engendered by measurement noise is to employ models whose error terms can cancel each other out through aggregation or can be accounted for through multicollinearity. It is

important to note, however, that the statistical processes that appear to reduce the effect of measurement noise on the magnitude of information effects constitute violations of the assumptions of regression (Fox, 1991), so they can only be used when the interpretation of regression parameters is not the primary goal of the study. This limitation is conspicuous in the analysis presented in this chapter, which is why I made no attempt at drawing any insights from the slopes and intercepts of the models and only made use of the bootstrapped predicted values.

Finally, we learn from the results of this study that information effects vary considerably across election studies, yet little or no variance can be accounted for by measurement noise. Consequently, aggregate level or institutional variables may be responsible for at least a portion of this variation. The most plausible candidates in this regard would be institutions that can mediate or moderate the acquisition of political knowledge by affecting citizens' opportunity to get informed and their motivation to do so (Fisher et al., 2008; Lau et al., 2008, Popa, 2015). In the following chapters I will put forward a more elaborate theory proposing and testing credible links between such variables and the magnitude of information effects in a cross-country fashion.

CHAPTER 4: VARIATION OF INFORMATION EFFECTS ON VOTE CHOICE IN 84 ELECTIONS

This chapter looks at the effects of political knowledge on the distribution of vote choice in all the election studies of the CSES where data are available. I argue that the impact of knowledge on vote choice should be contingent upon the simplicity of the electoral decisions that the respondents are faced with. Making a meaningful decision in an election where there are easily and readily observable differences between few political alternatives does not require any amounts of expertise. Conversely, in unpolarized multiparty systems where the elections are impersonal and governments rule by coalition, a citizen seeking to make a meaningful electoral decision needs to keep track of many political variables and a cognitively taxing electoral dynamics. Furthermore, I hypothesize that the complexity of the structure of government can diffuse the political responsibility of government actors, thus making it harder for citizens to hold politicians accountable through meaningful electoral decisions. In federal countries, with bicameral parliaments and fiscal decentralization, political knowledge is expected to be more consequential than in unitary states. Based on the findings reported in the previous chapter, it is expected that the theorized macro-level determinants of information effects on vote choice will be mostly visible with an interactive simulation model (the Bartelsian model) , rather than with a model in which only the direct effect of knowledge is specified. To this end, I use both approaches in parallel throughout this chapter, and compare the results at every step to establish whether the use of the more complex simulation model is justified. I find evidence in support of the hypothesized impact of choice-simplicity on information effects on 84 election studies of the CSES, and provide ample evidence for the superiority of the Bartelsian model compared to its direct-effect model alternative.

4.1. Information Effects on Vote Choice

It has been long argued that some degree of expertise is requisite for making sound electoral choices. The literature documenting the relationship between political knowledge and vote choice is vast, following Campbell, Converse, Miller and Stokes' (1960) discovery of astonishing levels of ignorance in the American public, and Downs' (1957) assertion that the learning of political facts may be irrational at times. Correlational studies found rather weak effects of political knowledge on vote choice, leading some scholars (perhaps most notably Lupia, 1994) to argue that factual political information is anything but crucial in persuading people to vote for one party or another. Rather, uninformed voters emulate the behavior of their more informed peers using cues (Lupia, 1994) and cognitive heuristics (Popkin, 1993). The simulation method developed independently by Bartels (1996) and Delli Carpini and Keeter (1996) has proven rather successful at finding information effects on vote choice, and its advent contributed greatly to the revival of the “knowledge matters” thesis. Since then, the use of the simulation model has become rather common in the study of information effects, with Sturgis (2003) using it to replicate experimental results from a deliberative poll, Toka (2010) using it to reveal information effects on vote choice in a sample of the Hungarian population, Hansen (2009) finding strong information effects in Denmark, Oscarsson (2007) bringing evidence of effects on electoral outcomes in Sweden, and Toka (2003; 2004) and Arnold (2012) using the method in cross-national studies of information effects.

The relationship between political knowledge and vote choice is more than just an intellectual concern for scholars in political science. Its practical implications are far reaching. A relationship between political knowledge and vote choice can be interpreted as evidence that citizens react to an objective political reality by voting, which is democratically reassuring. At the same time, there is no reason to expect the politically sophisticated to have needs different from those of the less politically knowledgeable, notwithstanding the association between people's political literacy and their socio-

economic characteristics or other qualities. This being the case, any relationship between political knowledge and vote choice would essentially entail an overrepresentation of the political interests that are associated with the more knowledgeable segments of society. The situation appears almost paradoxical: democracy relies on people's electoral decisions to be grounded in their awareness of political reality, but if political knowledge is predictive of vote choice, political representation may be compromised.

There is a solution to this conundrum. If the uninformed can successfully emulate the voting behavior of the informed (Lupia, 1994), people's voting behavior can reflect their political reality independently of their level of political awareness, as one can vote for the same party whether they are knowledgeable or not. If one has good reasons to believe that they have political interests identical to those of a much better informed neighbor, friend, spouse or organization, one can simply take the advice of the latter and vote accordingly. When such cues are available, uninformed individuals can emulate the behavior of their more informed peers, and they can remain rationally ignorant (Downs, 1957) while effectively pursuing their political interests. If this mechanism works, electoral democracies can function well without a well informed electorate, and the effect of political knowledge on individual vote choice is expected to be weak at best.

This is achieved to various degrees in different contexts and, indeed, by different individuals. In this chapter I argue that the relationship between political knowledge and vote choice is contingent upon individual level characteristics as well as on environmental factors pertaining to the voter's institutional context. Consistent with previous literature, I contend that the magnitude of information effects varies with the difficulty of making a meaningful electoral decision (Lau and Redlawsk, 2006), and I propose three broad categories of determinants of such difficulty: individual-level ones, election-specific and between-election ones.

4.1.1. Individual-level variation

Not everyone faces an equally hard task when it comes to making electoral decisions. One reason for this is that the availability of cues is likely to vary within a population (Lupia, 1994), thus forcing some voters to rely on factual knowledge more than others. For example, the average trade union member is probably more able than her peers to identifying politicians friendly to her cause, independently of her factual knowledge of politics. Marital status is also a rather apparent moderator of information effects on vote choice, as households commonly share the burden of knowledge acquisition, and spouses may sometimes take each other's candidate evaluations as at least partially correct without any thorough investigation of the reasoning behind them. There are likely countless other variables that belong to this list, many of them that are rarely available in social science surveys: club membership, size of social network, use of public transport, employment status, etc. This reasoning can be applied to any individual level characteristic that can shape a citizen's personal political environment.

Another likely reason underlying citizens' unequal informational needs is that the supply of parties or candidates that suit one's political interests must depend on one's actual interests, which are, in turn, contingent upon one's individual characteristics. For instance, a certain polity may have several political parties that cater to the needs of entrepreneurs, but only one party that pursues the interests of pensioners – in such a situation, political knowledge may have an impact on the vote choice of entrepreneurs, but it is unlikely to have one in the case of retired people. Ethnic, religious or sexual minorities likely face a similar narrowing of their choice set in polities where one or several parties have a well known history of intolerance towards minorities. A member of such a minority group needs less political knowledge for a meaningful choice compared to the rest of the population.

These considerations lead to the conclusion that a direct effect of political knowledge on vote choice may exist, but its full impact is likely composed of several indirect pathways, including interactions between political knowledge and a multitude of individual characteristics or socio-

economic variables (Bartels, 1996). That the effect of political information on citizens' decisions is interactive, rather than additive, is not a new proposition. Zaller (1992) proposed that “predispositions mediate people's responses to elite information”, and represent “the critical intervening variable between the communications people encounter in the media, on one side, and their statements of political preferences, on the other.” (Zaller, 1992 : 23), where “predispositions” refer to individual level characteristics or traits. This is the logic underlying the type of simulations developed by Bartels (1996) and Delli Carpini and Keeter (1996), whereby vote choice is regressed on political knowledge, a list of demographic variables and all the possible interactions between political knowledge and the other variables in the specification. The empirical evidence supporting the superiority of such models over the much simpler direct effect model is lacking.¹² Throughout this chapter, I compute all information effects using both the complex Bartelsian model and a simpler simulation model that only allows for direct effects of knowledge.

4.1.2. Election-specific effects

The extent to which knowledge can predict vote choice (or, indeed, any other outcome variable) depends on the informational demand of the decision task, therefore on the characteristics of the election in question: who is competing, how different are the competitors, what are the rules of the competition, what is the voter's task in the election. These are properties of the voters' environment that are most causally proximal to voting, and they are likely the strongest macro-level determinants of information effects on vote choice.

The impact of knowledge, thus, does not only vary across individual traits and demographically

¹² Bartels (1996) demonstration that an increase in model complexity beyond his chosen specification would be detrimental to model fit; Sturgis' (2003) compares the results of Bartelsian simulation models to those of a deliberative poll, but the question remains unanswered whether a simpler simulation with only a direct effect allowed would be satisfactory.

defined groups, but it likely varies from one election to another as well, or from one institutional setting to the next (Lau et al., 2014; Popa, 2015). As demonstrated experimentally by Levendusky (2010), citizens are more likely to take party and elite cues when the party system is more polarized, which is likely a consequence of the reduced ambiguity of elite cues when polarization is high. While Levendusky's study looks at attitude consistency as a dependent variable, Lau and his associates (2008, 2014) focus on institutional effects on correct voting, and conclude that more correct voting is associated with narrower and more differentiated choice sets – thus, fewer candidates and more polarization. In line with Downs' (1957) theory of rational ignorance, they argue that the expected benefits of a vote are negligible, making it crucial for citizens to be thrifty with regard to the information costs associated with their electoral decisions. This suggests that simplifying the decision task would improve the electoral decisions of citizens the same way as cues reduce the gap between the informed and the uninformed in the quality of their electoral decisions (Lau et al., 2014). This line of reasoning is also found in Kroh's (2009) discussion of ideological voting, where simpler institutional arrangements are shown to produce more ideological congruence between the voters and their preferred candidates or parties.

Consistent with these considerations, I hypothesize that weak information effects are expected in elections where voting appears to be an easier task: in countries with few political parties, high levels of polarization for easy differentiation between parties or candidates, and where parties or candidates run for office separately and not in coalitions, thus making it easier to ascribe political responsibility. These variables are essentially the same that generate high rates of correct voting (Lau et al., 2008; Lau et al., 2014) and ideological voting (Kroh, 2009). A control for the electoral system is necessary, however, as both coalition governments and multiparty systems are more common with PR electoral rules. PR systems may increase the magnitude of information effects, as voters under PR rules elect one out of several abstract entities, but such systems may also decrease information effects by

generating less disproportionality in election outcomes and reducing social inequalities in knowledge (Grönlund and Milner, 2006). I henceforth refer to the predictions made for this set of variables the *choice-simplicity* theory of information effects.

4.1.3. Between-election effects

Finally, there are more causally distal properties of polities that can affect the magnitude of information effects on vote choice. As these are characteristics of political systems that are not directly related to electoral politics, I refer to the following predictions as the *system-simplicity* theory of information effects.

One of the roles of elections is holding political actors accountable for the outcomes of their legislative and executive decisions. I argue that the task of linking political actors to specific political outcomes can be exceedingly strenuous in some political systems, while it is remarkably easy and straightforward in others. This is partly a consequence of the varying systems of checks and balances that scatter the responsibility for policies and legislation over multiple governmental bodies. I hypothesize that the more diffuse political responsibility is in a polity, the more consequential political knowledge will be in deciding citizens' electoral decisions. In countries with bicameral parliaments, with large degrees of federalism and fiscal decentralization, high levels of political knowledge are necessary for citizens to hold their representatives accountable.

Several other factors can hinder the attribution of political responsibility to candidates or parties, thus moderating the relationship between political knowledge and vote choice. Federalism, understood as a form of division of political power over several layers of government, makes it possible to conceal political responsibility from unsophisticated citizens by enabling politicians to credibly divert policy responsibility from one layer of government to another. Bicameralism,

decentralization, or any other form of segmentation of political power is likely to contribute to an increase in the complexity of the system, which would increase the cognitive effort and informational costs associated with the attribution of political responsibility to relevant parties. Such institutions may seem far removed from the vote, or from electoral politics in general, yet they are descriptive of the political environment in which citizens are socialized, where they form and discuss their political preferences and interests, where they strengthen, weaken and change their partisanship between elections, and ultimately express their opinions in elections.

Before proceeding to the empirical analyses, it is important to note that the argumentation presented in this manuscript is not meant to imply that some parties would not be voted by informed individuals, or by anyone in their right mind. Rather, it acknowledges that every individual has her own political interests, and there is always a candidate or party that can be characterized as her best choice in a given election (Lau and Redlawsk, 2001) if her aim is to act towards her best interests. Further, the argument assumes that the individuals most likely to correctly identify the candidate or party that best conforms to their own preferences are the ones who are generally more politically knowledgeable (Delli Carpini and Keeter, 1996; Toka, 2008). In other words, a fully informed individual with a given set of personal characteristics has a higher probability of casting a vote in line with their interests compared to a less informed individual with the same set of characteristics. The hypothetical constituency where everyone is perfectly informed about all things political is an “enlightened” constituency (Althaus, 1998).

4.2. Data

As in the previous chapters, CSES data (modules 1, 2 and 3) is used throughout this chapter. Vote choice refers to respondents' self-reported vote in the most recent parliamentary elections, excluding

polities where only presidential elections were covered. The demographic variables included in all model specifications are age, gender, level of education, income quintile, marital status, union membership, employment status, number of people in the household and religiosity. All individual level variables were unit standardized. The political knowledge variable represents the count of correct answers given by the respondents to the three political knowledge quiz items present in every CSES questionnaire.

In some election studies the income and education variables had high item non-response rates, which can lead to biased parameter estimates if the data is not missing completely at random (Schafer and Graham, 2002), as a Little Test (Little, 1988) can confirm for our data. The most problematic situation is when the pattern of missingness is related to the dependent variable (MNAR, or missing not at random), in which case the bias in the estimates can hardly be alleviated by missing data management techniques (Schafer and Graham, 2002). In our case, where the dependent variable is individual vote choice, MNAR would describe the situation in which people's refusal to report their education or income would be associated with their vote choice. Such a claim would not be wholly indefensible, but there are likely far better predictors of these non-responses than vote choice. By far the most likely scenario is that the respondents refused to report their level of education and income for reasons other than their vote choice, therefore the missingness is independent of our response variable. Hence, the data are missing at random (MAR). If this is the case, the missingness can be addressed effectively with multiple imputation (Honaker, King, and Blackwell, 2011). To this end, I generated five predicted values for each missing datapoint using the Amelia II program for multiple imputation (Honaker, King, and Blackwell, 2011) with all the available data from each election study. All the results reported in this chapter are computed on data sampled from the pooled database comprising of the five imputed versions of the original data.

In a few election studies, either the education or the income variable was missing altogether, in

which case the election study was excluded from the analysis. Religiosity and union membership were also absent wholesale from several polities, but rather than drastically reducing the working sample of polities by excluding more election studies from the database, I chose to replace these two variables with random values in the few polities where no valid observations were available. This allows us to use the same model specification in all election studies, thus reducing the risk of differential overfitting by keeping the number of parameters constant across samples. This enables us to model parameter estimates (fitted to individual level data) across election studies, due to their enhanced comparability.

Some of the macro-level variables used in the analysis were derived from CSES data, most notably the ones used for testing the choice-simplicity theory: the effective number of parties, party system polarization, and the formation of electoral alliances prior to the vote. The effective number of parties is computed using Laakso and Taagepera's (1979) formula $N = 1 / \sum w_i^2$ with w representing the number of seats won by each party. Following Lachat (2008) and Vegetti (2014), I compute polarization as the weighted distance of party positions from the ideological center of the polity¹³:

$$Polar = \sum (\bar{x} - x_i) * w_i \quad .$$

The variables I use for testing the system-simplicity theory were originally collected by Vatter and Bernauer (2013) as consensus democracy indicators for the CSES polities, following Lijphart's conceptualizations in *Patterns of Democracy* (1999). Testing the system-simplicity theory requires one additional step compared to the choice-simplicity theory, as the variables that tap into this construct are likely strongly correlated, and their impact on information effects are likely to overlap to a significant degree. Federal countries are more likely to have bicameral parliaments and to have some form of

13 The ideological center is computed with the formula $\bar{x} = \sum x_i * w_i$ where w represents the size of each party (proportion of seats) and x represents their ideological position, on an arbitrary left-right scale

fiscal decentralization; while these variables may collectively contribute to an increased complexity of the political system, their unique contribution to the overall complexity may not be substantial. Vatter and Bernauer (2013), as well as Lijphart (1999) contend that these variables pertain to a “federal-unitary” dimension of the classification of democracies along the majoritarian-consensual divide.

By means of factor analysis, we can tease out the variation that is attributable to the layered structure of government characteristic of federal countries, and we can isolate the construct from confounding factors that may correlate with federalism without being essential to it. For this purpose, rather than drawing a factor from the variables that are expected to be associated with the federal-unitary dimension, I include in the factor analysis all the other variables drawn from Vatter and Bernauer's data, and estimate a three-factor solution (Vatter and Bernauer, 2013), out of which one factor is expected to reflect the dimension we are interested in. Using varimax rotation ensures that the factors we compute are orthogonal to each other, thus minimizing the risk that we would erroneously attribute to federalism effects that are in fact driven by confounding factors. Table 4.1 below summarizes the results of the factor analysis, with all loadings of absolute magnitude below 0.3 omitted:

Table 4.1: Three Factor Solution: Loadings

	Factor1	Factor2	Factor3
Number of Parties		-0.761	0.321
Oversized and minority coalitions			0.678
Executive dominance		0.631	-0.431
Disproportionality of the electoral system		0.764	
Corporatism vs. pluralism		-0.610	
Federalism	0.963		
Fiscal decentralization	0.819		
Bicameralism	0.703		
Judicial review	0.403		
Direct democracy			0.518

The results of the factor analysis are fully consistent with Vatter and Bernauer's (2013) findings on a limited subset of the CSES data. Federalism, fiscal decentralization and bicameralism load on the first factor, labeled “federal-unitary” following Lijphart's (1999) terminology. The second factor is associated with the effective number of parties, the preeminence of the executive, the electoral disproportionality and the degree of corporatism. A third factor, labelled “direct democracy” by Vatter and Bernauer (2013), has high loadings on the degree of direct democracy and on cabinet structure (oversized and minority cabinets versus minimal winning coalitions and single party governments). Central bank independence and constitutional rigidity were not found to load on any of the three factors, and they were thus excluded from the solution presented in Table 4.1. Low values on each of these factors correspond to majoritarian democracies, whereas high values are expected in countries with more “consensual” institutions in place.

4.3. Methodology

I use a Bartelsian modeling approach (Bartels, 1996) for estimating the effect of political knowledge on vote choice, as described in Chapter 3 with regard to the estimation of information effects on turnout, satisfaction with democracy and political efficacy. In short, the dependent variable – vote choice in this case – is regressed on political knowledge, socio-economic variables, and all the possible interactions between knowledge and the other variables in the model. I use a multinomial regression with a logistic link function, with the specification shown in equation (1) below,

$$\frac{P_{il}}{P_{in}} = \alpha_n + \beta_n K_i + \sum \beta_{jn} V_{ij} + \sum \delta_{jn} (V_{ij} * K_i) + \varepsilon_{in} \quad (1)$$

where i is the individual respondents identifier, n is the party subscript, j is the parameter identifier, α , β and δ are parameter estimates, ε is the error term, K is the political knowledge variable, and V are the

socio-economic variables in the model specification. The left side of the equation refers to the ratio between respondent i 's probability of voting for party 1 (reference) and her probability of voting for party n .

A different set of coefficients is estimated for each political party other than the reference (arbitrarily chosen as the party with the largest number of voters in each election study), which allows us to construct a separate regression equation for the contrast between each party and the one chosen as reference (as suggested by the n subscripts in equation (1)). The predicted probabilities for each political party cannot be computed simply by exponentiating the coefficients as illustrated in the previous chapter, where logistic regression was used for modeling individual level turnout, because the outcome modeled with each of the equations of the multinomial model is merely a contrast between two parties out of several choices available to the voters in most polities. However, the sum of the probabilities for all parties is always equal to 1 for any given respondent, which allows us to combine the equations to predict each respondent's probability of voting for each party, as shown in equation (2):

$$P_{in} = \frac{e^{\alpha_n + \beta_n K_i + \sum_{j=1}^{\max(j)} \beta_{jn} V_{ij} + \delta_{jn} V_{ij} K_i}}{1 + \sum_{n=1}^{\max(n)} e^{\alpha_n + \beta_n K_i + \sum_{j=1}^{\max(j)} \beta_{jn} V_{ij} + \delta_{jn} V_{ij} K_i}} \quad (2)$$

In each election study included in the analysis, equation (2) will return for every respondent a vector of length n (where n is the number of parties or candidates in the most recent election)¹⁴ containing the respondent's predicted probability of voting for each of the parties in their polity. The party with the highest probability of being voted by the respondent represents their predicted vote choice, as shown in equation (3) below.

¹⁴ In fact only $(n-1)$ probabilities are computed from equation (2), the reference category is calculated separately by subtracting from 1 the probabilities of all the other parties

$$Vote_i = \max(P_{i1}, P_{i2}, \dots, P_{in}) \quad (3)$$

The magnitude of the information effect is given by the cumulated difference between the predicted vote distribution under normal conditions (modeled on the real CSES data), and the simulated vote distribution for a more informed electorate. The Pedersen index (Pedersen, 1979) is used for estimating the difference, whereby the net change in vote choice is equal to half of the sum of wins or losses registered by each of the parties (or candidates) in the competition (see equation (4) below).

$$\frac{1}{2} \sum_{n=1}^{\max(n)} \Delta P(Vote_n) \quad (4)$$

Three vote distributions were considered for this chapter. First, the vote distribution predicted by the model is given by equations (2) and (3), using the matrix of parameter estimates and the CSES subjects' responses. A second and third vote distribution are generated by the same equations by substituting the real values of political knowledge in the CSES data with the maximum, respectively the minimum values allowed on the political knowledge scale, as discussed in the previous chapter. By comparing the three distributions we can estimate a maximum information effect, where the maximally informed sample is compared to the minimally informed one, and a regular information effect where the maximally informed sample is compared to the real sample. I call the two effects “Total max” and “Total effect”, as they are computed from a model where multiple interactions were specified between political knowledge and socio-economic variables, thus the information effect is composed of several pathways linking political knowledge to vote choice.

In addition to the information effects discussed above, I also computed information effects from a model where only the direct effect of political knowledge is specified, with the same socio-economic variables as controls (see equation (5) below) but all the interaction effects excluded. Here too, a regular and a maximal effect were estimated. The computation of the direct information effects is

analogous to the one described above for the total effects, thus describing the process again would be redundant.

$$\frac{P_{il}}{P_{in}} = \alpha_n + \beta_n K_i + \sum \beta_{jn} V_{ij} + \varepsilon_{in} \quad (5)$$

4.4. Analysis

Appendix II summarizes in table form the effects found in each CSES election study where all the variables required for analysis were available. It shows the percentage of the population that are predicted to change their vote preference following a hypothetical increase in their level of political knowledge. The significance of each information effect is tested by comparing the point estimates to their standard deviation over 1000 samples with replacement from each election study. For this purpose I use a *z*-test, with a significance threshold of $p=0.05$, which corresponds to a *z* score of 1.96. The thresholds are depicted in Figure 4.2 with lines at $x=1.96$, and $y=1.96$.

A condensed summary of the results can be seen in Figure 4.1 below, where the information effects are plotted for both the “total” and the “direct” effect operationalizations described above. For easy comparison of the magnitude of effects and errors obtained with the two different operationalizations, I added a diagonal line (slope=1) to the graphs. Data points below the diagonal line reflect higher magnitude for the estimate indicated on the *x* axis, whereas data points above the diagonal correspond to stronger magnitude for the estimates indicated on the *y* axis. All data points represent election studies; red points show the expected change in vote choice from maximal increases in political knowledge, whereas blue points show the change expected from more plausible infusions of knowledge. Several noteworthy findings emerge from the figures, to be discussed in the following paragraphs.

Figure 4.1: Information Effects on Vote Choice Computed with 4 Different Operationalizations

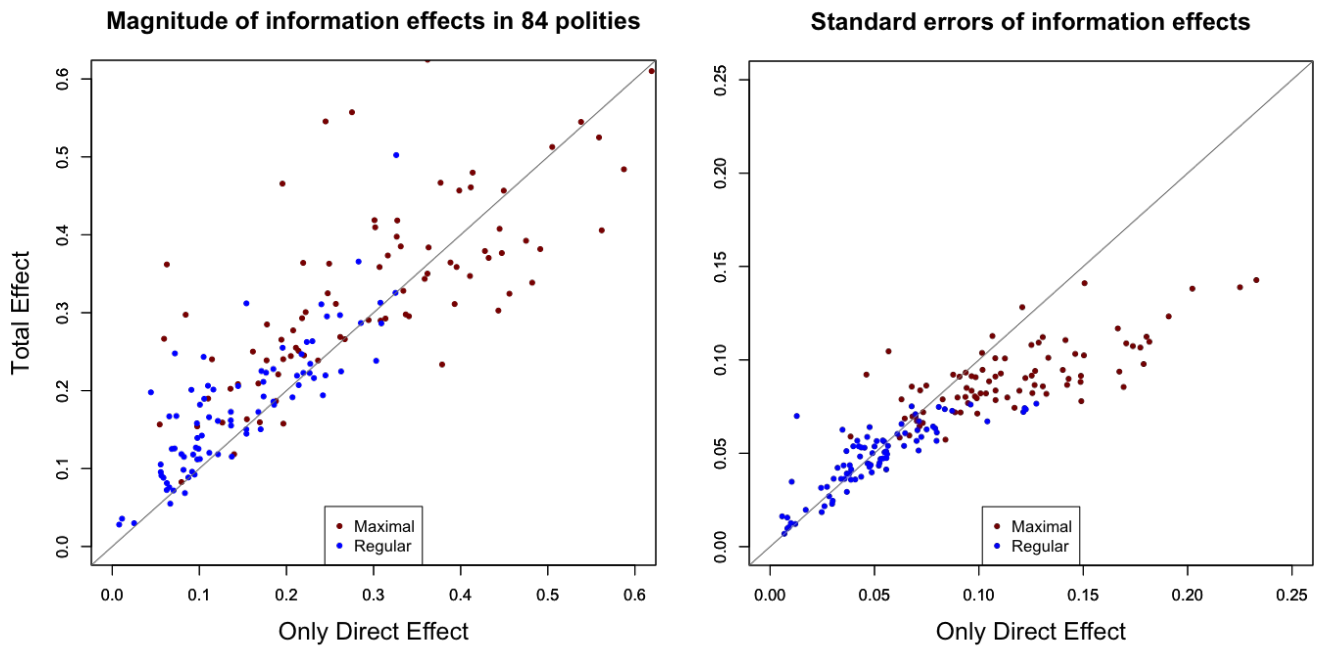
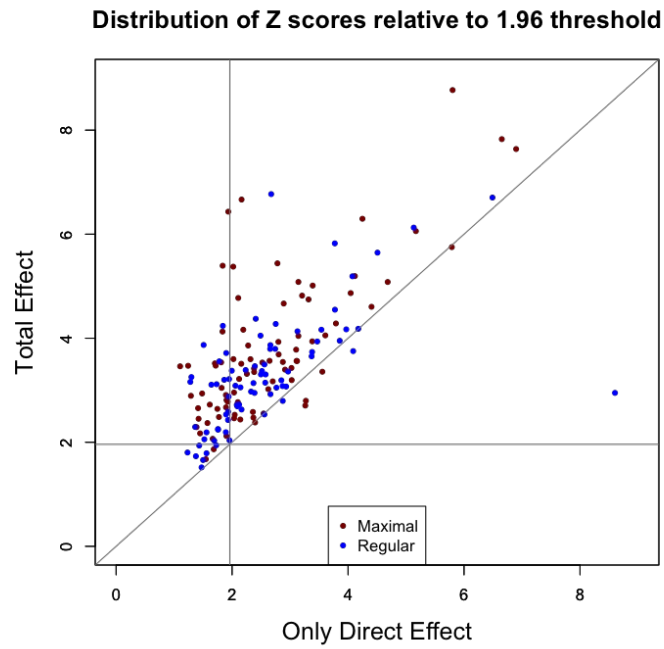


Figure 4.2: Statistical Significance of Information Effects



In 82 of the 84 election studies (Great Britain, 1997 and Australia, 2007 are the exceptions) political knowledge appears to have a significant effect on the distribution of votes when the information effect is operationalized as the simulated impact of a maximum infusion of knowledge over multiple pathways (“Total Max”, in the table in Appendix II). This is seen in the distribution of z scores in Figure 4.2 above, as only two red points fail to pass the 1.96 threshold on the vertical dimension. A more realistic infusion of knowledge would generate significant changes in vote distributions in 77 polities. When the information effect is operationalized as the direct impact of knowledge on vote choice, only 57 of the 84 polities display significant effects, or 55 if moderate increases of knowledge are considered. The high frequency of insignificant direct effects is manifest in Figure 4.2, where a high concentration of blue and red points can be seen to the left side of the 1.96 vertical line. In fact, if we divide the plot into four quadrants delimited by the two significance thresholds (the vertical line at $x=1.96$ and the horizontal line at $y=1.96$), we see that the top left quadrant is very densely populated, whereas the bottom right quadrant is empty. While it is common for election studies to display statistically insignificant direct effects whose total effect counterparts are significant, we do not find any situation in which the opposite is true. The total effect operationalization appears to be better suited for detecting information effects.

For every 14 significant information effects found with the total effect operationalization, the direct effect operationalization would identify only 10 significant effects. However, the size of the effects is in fact not starkly different when the total effects are compared to the direct effects: the total effect of a full information increase in the average polity is 33%, whereas the direct effect is 30%. Similarly, the total effect of a moderate information increase in the average polity is 17%, compared to the average direct effect of 14%. A t-test between the size of the direct effects and that of the total ones shows no significant difference in magnitude for a simulated maximum increase in knowledge (column 1 versus column 3 in the table in Appendix II), but when a more realistic infusion of knowledge is

considered (column 2 versus column 4 in the table in Appendix II), the total effects are significantly stronger than the direct ones ($t=2.56$, $df=165.733$, mean difference = 3.21). While the total effects appear to be vastly superior to the direct effects in their relationship to their respective standard errors, as shown in Figure 4.2, their overall magnitude is not overwhelmingly superior to the latter. In fact, the maximum effect found was the direct effect in Ukraine, 1998, where 68% of a hypothetically fully uninformed electorate would change their vote upon a maximum gain in political knowledge. The escalation of standard errors under the direct effect operationalization can be seen on the right hand side of Figure 4.1, where most data points are concentrated in the lower triangle, suggesting higher variance for direct information effects than for total effects. This is precisely what one would expect of an unreliable measure: high variance in relation to the mean.

It is still possible, however, that the true relationship between political knowledge and vote choice is accurately described by the direct effect and not by the more total one, if the total effect is systematically biased (or more biased than the direct effect). Were this to be true, the direct effect should perform better in association with variables that can be linked theoretically to stronger or weaker information effects. To this end, I repeated the estimations presented previously, and computed the correlation between the information effects across the 84 election studies with the hypothesized institutional predictors of information effects, including the indicators of choice–simplicity mentioned in the theory section. The procedure was repeated over 1,000 resamples (a new sample from each election study on each iteration) thus every coefficient reported in Table 4.2 represents the mean of their empirical distribution. As all coefficients are normally distributed¹⁵ (the mean kurtosis of all distributions is -0.03, ranging from -0.33 to 0.38; the mean skewness is 0.05 and ranges from -0.18 to 0.25), their significance was established using a two-tailed z-test.

Correlations are informative as an exploratory exercise, but they offer little in the way of

¹⁵ This is a corollary of the Central Limit Theorem, as the coefficients have empirically improbable bounds (-1 and 1, in the case of correlations), and their error is assumed random.

hypothesis testing. Hence, in addition to the correlation coefficients previously mentioned, with each of the 1,000 iterations I also regress the information effects on the macro level characteristics of the sampled countries, as seen in equation (6) below proposed as a test of the choice-simplicity theory. The significance of the coefficients is computed using their empirical distribution thus generated, with a z-test. The proportion of variance in the information effects that was successfully accounted for by the explanatory variables represents the average adjusted R square of the regression models, and the significance of the estimates is computed in the same fashion as that of the regression slopes. The results from this stage of the analysis are reported in the second part of Table 4.2 below.

$$I = \alpha + \beta_1 K + \beta_2 * No. Parties + \beta_3 * Polarization + \beta_4 * PR + \beta_5 * Ally + \varepsilon \quad (6)$$

Table 4.2: Variation of Information Effects on Vote Choice by Macro-level Factors

	On the Total Effect (maximum)	On the Total Effect	On the Direct Effect (maximum)	On the Direct Effect
Bivariate (correlations)				
Number of parties	0.29* (0.06)	0.26* (0.05)	0.19* (0.06)	0.20* (0.07)
Polarization	-0.10 (0.06)	-0.12* (0.06)	-0.02 (0.07)	-0.11 (0.06)
PR electoral system	0.21* (0.06)	0.02 (0.05)	0.14* (0.06)	0.08 (0.06)
Electoral alliances formed?	0.18* (0.06)	0.06 (0.05)	0.10 (0.06)	0.06 (0.06)
Multivariate (OLS coefficients)				
Intercept	23.13* (3.88)	14.06* (2.44)	21.34* (5.17)	11.86* (2.42)
Number of parties	2.40* (0.60)	1.46* (0.37)	1.89* (0.75)	2.33 (1.39)
Polarization	-12.79 (7.77)	-8.23 (4.60)	-4.04 (11.42)	-7.98 (4.60)
PR electoral system	7.83* (2.32)	0.30 (1.21)	7.55* (2.97)	2.33 (1.39)
Electoral alliances formed?	5.17* (2.13)	1.77 (1.22)	3.10 (2.79)	1.67 (1.30)
<i>Adj. R</i> ²	0.160	0.057	0.050	0.036

* p<0.05

Most of the statistically significant correlations were found with the total effects. The only correlation that is significant across all four operationalizations of information effects is with the effective number of parties, yet the correlation is weaker for the direct effect than it is for the total effect. In line with the theory put forward in the previous sections of this chapter, information effects are generally stronger in polities where making an electoral decision would require more cognitive effort on behalf of the citizens: wherever electoral alliances were formed, where a system of proportional representation is used, where there are more parties or candidates to choose from. The

effect of polarization is only statistically significant with the second total effect operationalization (corresponding to a moderate increase in knowledge), yet it points in the expected direction across all four operationalizations: the more polarized the system, the weaker the information effects on vote choice.

Instead of reporting standardized coefficients, the figures in the second part of the table are scaled in an intuitive way, allowing the reader to directly relate the values to their practical implication. The coefficient for *Number of Parties* shows the average effect of an additional political party on the percentage of voters who would change their vote as a result of a maximum shift in their level of political knowledge (in columns 1 and 3), or as a result of an increase in knowledge from their actual level to the maximum level of knowledge that we can observe (columns 2 and 4). All other things being equal, an extra party would increase the difference in the simulated outcome between the “ignorant” and the “enlightened” constituency by about 2.40 percentage points (column 1), or 1.89 points (column 3), depending on which operationalization of information effects one finds more compelling. Compared to other electoral systems, list PR generates increases of roughly 7-8 percentage points in the difference in simulated election outcomes between the ignorant and the enlightened constituency (columns 1 and 3), but no significant change appears to be attributable to the electoral system with the remaining two operationalizations. In polities where electoral alliances were formed, the electoral volatility between an “enlightened” constituency and an “ignorant” one would be roughly 5.17 percentage points higher than it would be in polities where no electoral alliances were formed, yet this effect was only found with the first operationalization of information effects (column 1).

It is important to note, that the model summarized in column 1 of Table 4.2 is the only one that fits, and even though it only accounts for about 16% of the variance in information effects, its explanatory power is a net improvement over the subsequent models. Polarization is the only variable that was not found to be significantly linked to the size of information effects with any of the models,

but it is close to passing the 0.05 threshold in the second and fourth model, where the effect of a moderate increase in knowledge is the response variable. A negative effect of polarization on the magnitude of information effects is plausible (Lau et al., 2008; Lau et al., 2014), though the evidence presented in this chapter is insufficient for rejecting the null hypothesis. Finally, the coefficients shown in the first column of Table 4.2 are statistically significantly stronger than all the other effects in the table,¹⁶ save for that of the electoral system, which is equally strong in column 3 as it is in column 1.

As we did before in testing the choice-simplicity theory, we test the system-simplicity theory by computing correlations between the four measures of information effects and the three factors, using 1000 rounds of sampling cases with replacement from each polity. The same bootstrapping procedure is used for regression models where information effects are the outcome variables, and the three factors are the explanatory. The results from this stage of the analysis are presented in Table 4.3 below, with OLS estimates reflecting the expected change in the size of the information effect, in percentage points, generated by a full shift (from 0 to 1) in the values of the explanatory factors.

¹⁶ I used a t-test to compare the empirical distributions of the coefficients

Table 4.3: Information Effects by Type of Democracy

	On the Effect (maximum)	Total On the Effect	Total On Direct Effect (maximum)	the On Direct Effect	the On Direct Effect
Bivariate (correlations)					
Federal-unitary	-0.10 (0.08)	-0.00 (0.07)	-0.07 (0.07)	0.01 (0.09)	
Parties-elections	-0.01 (0.08)	0.02 (0.06)	0.04 (0.10)	0.05 (0.08)	
Oversized cabinet-direct democracy	-0.03 (0.07)	0.14 (0.07)	0.00 (0.09)	0.08 (0.09)	
Multivariate (OLS coefficients)					
Intercept	33.72* (1.30)	18.85* (0.70)	30.35* (1.82)	14.91* (0.85)	
Federal-unitary	-5.37 (4.07)	0.26 (2.23)	-4.39 (6.01)	0.75 (2.91)	
Parties-elections	-1.06 (5.46)	1.93 (2.74)	3.40 (7.01)	2.30 (3.13)	
Cabinet-direct democracy	-2.65 (4.66)	5.29 (2.85)	0.89 (6.57)	3.22 (3.28)	
<i>Adj. R²</i>	-0.031	-0.027	-0.028	-0.031	

* p<0.05

The results are a textbook example of coefficients computed on uncorrelated data. 24 quantities were estimated, none of them significant at the 0.05 level, with two coefficients passing the 0.1 threshold, as chance would predict. The histograms of the bootstrapped coefficients (not reported for reasons of redundancy, but available on request) show normally distributed values around an average value of 0, reflecting the sheer lack of explained variance attributable to the three factors. The only significant predictor of information effects is the mean of information effects, as suggested by the significant intercepts in the multivariate models summarized in Table 4.3. There is no support found for the system-simplicity theory discussed above.

4.5. Discussion

Previous chapters have shown that political knowledge is often measured with considerable amounts of random noise, which can contribute to increasing type II errors in studies trying to reveal associations between political knowledge and other variables. Chapter 3 demonstrates that a model specification containing numerous joint effects of political knowledge alongside the direct effect, as is common practice with simulation models previously proposed in the literature (Bartels, 1996; Delli Carpini and Keeter, 1996), can in fact significantly ameliorate the hindrance caused by measurement noise. This chapter takes the natural step further and tests the most relevant implication of the previous chapters: that the simulation model enables researchers to find information effects that would likely not be detected with simpler model specifications. To achieve this, I compute the effect of political knowledge on vote distributions in 84 elections from the three modules of the CSES database, and compare the results found with a direct-effect operationalization of information effects to those found with the full simulation model. I find that the full simulation method is vastly superior, detecting 40-50% more significant information effects compared to the alternative method that specifies only a direct effect. Furthermore, the effects found with the full simulation model also display better convergent validity than the direct effects, as they correlate better with institutional variables that are theorized to be associated with the magnitude of information effects.

Substantively, this chapter hypothesizes that the simpler the decision task the voters face at the polls, the weaker the information effects should be in their polity. I argue that an electoral decision is generally easier in polarized systems, with few parties competing individually and not as part of coalitions, and where voters do not choose between party lists as they do in PR electoral systems. I test the theory using a two-step multilevel model (Jusko and Shively, 2005), whereby the information effect is estimated within each country and regressed on the aforementioned institutional variables, and repeating the procedure on enough subsamples to generate the empirical distribution of each

coefficient. I only find support for the theory with the full simulation model, where the information effect is operationalized as the net change in vote distributions brought about by the maximum change in political knowledge allowed in the sample. The other models did not account for a significant amount of variation in information effects. However, the results are likely credible, since all models reveal institutional effects consistent with the the choice-simplicity theory. Information effects are strongest in multiparty PR systems where parties candidate as part of electoral coalitions, likely due to the reduced utility of helping cues (most notably party labels) in such contexts. Surprisingly, the effect of polarization did not achieve statistical significance despite the remarkable magnitude of the point estimates. This is probably a consequence of polarization's psychological effects beyond the simplification of electoral choices. I further hypothesize that polities with multiple layers of government should display stronger information effects on vote choice due to the increased difficulty that voters face in holding politicians accountable in such systems. I find no support for this “system-simplicity” theory, regardless of the operationalization of information effects used.

It is important to note that the choice-simplicity theory proposed in this chapter would have been rejected, alongside the system-simplicity theory, had we only tested it using the direct effect approach. This is because the only fitting model of country-level effects was the one where the information effect was operationalized as the cumulative effect of a maximum increase in political knowledge on vote choice. The results can thus be interpreted as corroborating evidence for the validity of the Bartelsian simulation, as these interactive models show superior power to detect theorized effects (that were previously found in experimental settings) that would otherwise be indistinguishable from zero. At the same time, the increased statistical power gained with such complex models does not appear to come at the cost of higher rates of Type I errors, as the system-simplicity theory proposed in this chapter is consistently rejected with all four operationalizations of information effects. This conclusion is in full agreement with the methodological arguments put forward throughout this

dissertation.

Methodology considerations are worth our attention insofar as they contribute to substantive insights. The findings of this chapter suggests that simulation models of information effects can indeed provide important insights about democratic systems and politics in general, beyond the capabilities of simpler modeling procedures. I argue that accountability is fundamental to representative democracy, and in order for citizens to exercise effective control over their government's composition and policies, their vote choice must be grounded in political reality. Knowing more about one's political reality should improve one's ability to make correct assessments of it. On the other hand, if knowledge about politics is a predictor of vote choice, it distorts democratic representation by giving voice to people proportional to their knowledge of facts. The choice-simplicity theory specifies conditions under which the democratic requirement of a reality-grounded electoral behavior does not hinder the ability of politically ignorant citizens to emulate fully informed choice behavior at the polls. Perhaps surprisingly, the macro-level qualities that are predictive of weak effects of knowledge on vote choice are often cited in the political science literature as undesirable, or democratically inferior. Proportional representation, as well as multiparty systems and coalition governments, are associated with the consensual model of democracy (Lijphart, 1999), which is often deemed superior to the majoritarian model. These variables, however, tend to increase information effects rather than decrease them. Moreover, a high level of polarization is considered a token of a conflictual political climate, and it is often viewed as undesirable due to its negative effect on economic and legislative indicators (McCarty, 2007; Lupu, 2015), but it appears to decrease information effects. The findings reported in this chapter, however, should not be interpreted as a championing of majoritarian institutions. While some majoritarian institutions may mitigate the political inequality fostered by knowledge asymmetries, they might at the same time decrease the overall quality of political representation. It is not necessarily true that the uninformed benefit from better political representation in countries that sport such majoritarian

institutions; perhaps know-alls and know-nots are represented equally poorly in such countries. There is a multitude of factors that may offset the effects of knowledge asymmetries on political representation, as the rich literature on institutional effects on accountability can attest (Lijphart, 1999; Tsebelis, 2002). Finally, while the results successfully corroborate the choice-simplicity theory put forth in this chapter and unambiguously warrant the rejection of the system-simplicity theory, the analysis has several noteworthy methodological limitations.

The formal demonstration at the end of Chapter 3 suggests that the number of parameter estimates in the model specification of a Bartelsian simulation is correlated with a decrease in reliability-related attenuations of information effects. The models used in this chapter could have probably benefitted from a richer specification; however, including more variables would have required the exclusion of some countries from the working sample, a tradeoff that may have been detrimental. By having fewer variables in the specification, I underestimated the difference between the reliability of the total effects and that of the direct effects, thus increasing the type II errors of the study. Finally, it would be premature to conclude that the information effects estimated with interactive models are always superior to those estimated from direct effects of political knowledge, as it is possible that this finding only holds when vote choice is the dependent variable, or when the simulations are run with multinomial logistic regression models. The exceptionality of information effects on vote choice is particularly relevant, as it is reasonable to expect a large part of the effect of information on vote choice to be indirect (Zaller, 1992), thus justifying the inclusion of many joint effects in the simulation model. Furthermore, even though none of the interaction effects in the model has a theoretical reason to be included, they are far from meaningless in light of the role of political knowledge in bringing people's electoral choices closer to their true political preferences, interests and identities. This conjecture will be tested in the following chapter.

CHAPTER 5: WHEN KNOWLEDGE IS FUTILE, AND WHEN IT COUNTS

It may seem sensible to believe that a politically knowledgeable populace is crucial for the functioning of democratic institutions, or that democratic elections require an informed citizenry. Our most basic intuitions tend to agree with such a claim; whoever knows the rules of the game, the players and their strategies, is more likely to play a good game or coach a good team. Even non-academics have raised awareness of this problem; in fact, the need for a cognitively engaged citizenry resonates strongly in many if not all social strata. We learn from Lisa Simpson from *The Simpsons*, that “the price of freedom is eternal vigilance”¹⁷. Whether political knowledge is indeed important for democracy is an empirical question that has been often addressed in the social scientific literature with various degrees of success. One of the plausible explanations for the varying success of such studies is that the relevance of political knowledge is contingent upon contextual factors.

The previous chapter has focused on the variation of information effects on vote choice. Historically, the magnitude of such effects was often found to be rather underwhelming, which has been attributed in the literature to the use of cognitive heuristics (Lupia, 1994), to the simplicity of the electoral decisions under scrutiny (Lau et al., 2008), to the aggregation process that allows individual-level effects of opposite signs to cancel each other out when added together (Page and Shapiro, 1992), or to campaign effects that may assist people in identifying the candidates that best fit their political interests (Gelman and King, 1993; Erikson and Wlezien, 2012). With the exception of the aggregation hypothesis, these theories specify conditions under which the voting behavior of the uninformed is most similar to that of the informed. What lends credence to such theories is that some electoral decisions can reasonably be characterized as more apt than others, and the cognitive process by which people arrive at their decision is irrelevant with regard to the aptness of their actual decision.

¹⁷ Often wrongly attributed to Thomas Jefferson, the source of the original quote could not be traced to date

I extend this line of inquiry in this chapter to explain information effects on political attitudes and behaviors other than vote choice: some attitudes and behaviors are more “enlightened” than others, and they can be learnt through the acquisition of political knowledge, or by alternative means. Contextual factors, such as political institutions, can act as devices that streamline the processes linking knowledge to behavioral and attitudinal outcomes. Simplifying features of political communities can reduce the informational burden necessary for developing apt political attitudes and behaviors, in a manner akin to that discussed in the voting behavior literature with regard to information effects on vote choice.

I illustrate this streamlining property of contextual factors by investigating the variation in the effect of citizens' political knowledge on their political efficacy, satisfaction with democracy and turnout in a sample of consolidated democracies from all continents. I first operationalize information effects as the slope of citizens' political knowledge on the response variable (*direct effect*), then as its cumulated impact over multiple pathways (*total effect*), and regress it on the population size, number of parties, the degree of party system polarization, and degree of federalism. I use the three modules of the Comparative Study of Electoral Systems for all analyses, and find support for my theory.

5.1. Uninformed but not Hopeless

The tension between the democratic need for a knowledgeable electorate and the empirical reality of well functioning democracies with largely uninformed citizens finds partial resolve in the simplification of decisions through cues and institutional designs. The amount of information from which citizens can draw their knowledge of politics is either infinite or prohibitively large, depending on the broadness of one's concept of politics. Even relatively simple political decisions require enormous investments of time and attention on behalf of the electorate if a fully informed decision is

sought. Lupia (1994) illustrated this by showing that the text of the ballot initiatives put forward for the 1988 insurance reform poll in California counted more than 26,000 words of technical language; reading the material would easily take two hours of one's time, comprehending it may take much longer. Such a learning task would carry opportunity costs as high as several percentage points of the annual insurance premium paid by the average Californian. A rational citizen would only cast a meaningful vote under such auspices if she could find a way to expedite the decision making process.

Cues are heuristic tools used for keeping the information processing demands within reasonable bounds (Lau & Redlawsk, 2001). Much of the research on cues in the political science literature focuses on their role in helping uninformed citizens emulate the electoral behavior of more informed peers (Lupia 1994; Popkin, 1994; Lau & Redlawsk, 2001; Dancey & Sheagley, 2013), the assumption being that the citizens who are most likely to cast a vote consistent with their own interests are the most politically knowledgeable ones. Cues can only be effective, thus, if uninformed voters are aided by them a lot more than their informed peers, otherwise the gap between the quality of informed decisions and uninformed ones would only widen with the use of cues and heuristics. Existing research suggests that the effectiveness of cues may depend on the kind of decision in question and cue being used – while Lupia (1994) finds that cues reduce the gap between the informed and the uninformed, Lau & Redlawsk (2001) find that the use of heuristic cues primarily helps the informed rather than the uninformed¹⁸. Though the amount of information needed for a correct decision in the presence of cues is indeed reduced, the behavioral gap between the informed and the uninformed may increase if the former are better equipped to make use of the relevant cues. There is, thus, considerable variation in the informational requirement for a correct decision at all levels of observation, from the individual level to

18 This may seem rather unsurprising. After all, cues are snippets of information about ones' political environment, and it stands to reason that political knowledge should be positively correlated with having valid cues, making them more likely to be used by knowledgeable citizens. However, this need not be the case if cues are of very low difficulty – ex: the partisanship of presidential candidates – and there is an upper limit to the amount of political knowledge that can be useful in electoral decisions, in which case cues can reduce the knowledge gap between the more sophisticated and the less sophisticated.

the macro-level of the political community (polity or election).

Lupia (1994) approaches the matter of heuristic cues from a principal-agent perspective, where the agent is the cue-giver, and the principal is the cue-taker in a situation resembling a signaling game – the signal being the cue. If the agent is knowledgeable, lacks any considerable incentives to deceive, and has interests identical or similar to the principal's, the principal is well advised to take the agent's cue and thus drastically reduce their personal contribution to the decision making effort (Lupia and McCubbins, 1998; Lupia, 1994). Conversely, if the cue-giver falls short of any of these characteristics, taking cues from them would be detrimental to the political interests of the hypothetical cue taker.

In reality there is a great deal of uncertainty surrounding each of these qualities of the cue-giver as they reveal themselves to the cue-taker. The uninformed voter may be able to use heuristic cues to emulate the electoral behavior of the informed depending on the capacity of the cue-giver to convincingly convey their political sophistication and congruent interests. Consequently, it is apt to assume that not all cues are created equal (Lau and Redlawsk, 2001); in some cases the interests of the cue givers are rather transparent, and the citizens are aware of their personal stakes in the political decision in question. In the case of the aforementioned 1988 insurance reform poll, it is unsurprising that voters have made successful use of their knowledge of which initiatives were endorsed by the insurance companies (Lupia, 1994). In other situations, however, knowing which side the informed elites are taking in the electoral competition may be of little help. Dancey and Sheagley (2013) found that the political sophistication of citizens is negatively associated with their ability to correctly indicate their senator's position on high profile roll-call votes whenever their senators vote against their party of membership. Party cues, the authors conclude, are only useful when political actors behave in predictable ways (Dancey and Sheagley, 2013), but, similar to ideological cues, they mostly mislead whenever the political environment fails to conform to expectations (Lau and Redlawsk, 2001; Arceneaux, 2008).

Not all cognitive shortcuts to decision making involve cues that rely on other people's declarative intentions and endorsements. Cognitive heuristics refer to mental strategies that decision makers use for organizing their knowledge in order to keep the decision making effort manageable. In candidate centered elections, it is not uncommon for citizens to base their evaluations of candidates on the degree to which they conform to relevant stereotypes, to take into consideration only the most available data about candidates, rather than the most relevant ones, or to give excessive weight to information about the personal lives of candidates, as opposed to their public performance and actions (Popkin, 1994). Employing such heuristics may considerably reduce decision-making costs, but the quality of decisions arrived at by such mental shortcuts is likely affected. It should come as no surprise that people's stereotypes are not always accurate, that the availability of information related to any given election is not driven primarily by their relevance, or that a politician's private conduct is a weak predictor of the policies they are likely to enact or endorse. The multiple ways in which the use of heuristics can bias judgments under conditions of uncertainty are well documented (Kahneman, Slovic, and Tversky, 1982), and the effectiveness of various campaign strategies such as priming and framing (Druckman, 2004) stands proof of the systematic errors in judgment induced by heuristics.

What the cognitive tools discussed so far have in common is that they are all subject to manipulation by office-seeking parties or candidates, organizations or economic actors that hold stakes in the outcomes of the electoral competition, or private individuals seeking to increase the electoral support for their preferred candidate. Heuristic cues, however, broadly understood as devices that streamline decision making processes, can be provided by a wide range of mental strategies or social and political institutions. Party identification, understood as the individual's running tally of how well political parties attend to his or her political interests (Fiorina, 1981), can provide the citizen with a workable shortcut to arriving at electoral decisions. This, of course, is only feasible if citizens can update their party identification (Achen, 1992; Gerber and Green, 1998) at costs lower than those

incurred by a shortcut-free electoral decision. It follows that party identification mostly constitutes a viable workaround in individuals with policy preferences and political attitudes that are relatively stable over time, and in polities with consolidated party systems where the relative positioning of parties on the relevant dimensions of electoral competition is easily predictable.

None of these cost-reducing strategies comes without a caveat, and their effectiveness appears to be more idiosyncratic than universal. However, the sheer multitude of cognitive shortcuts and the varying ways in which they affect how knowledge impacts individual behaviors suggest that the sensible approach to estimating information effects would be one that would account for the idiosyncratic variability of the importance of political knowledge. The Bartelsian simulation approach, used in the previous chapters of this thesis, is therefore likely to better approximate true information effects compared to models where only a direct effect of knowledge is allowed.

The magnitude of information effects is also affected by institutional variables. Most notably, it is argued that the country level (or election level) factors that simplify electoral decisions are bound to reduce the importance of political knowledge in voting, thus making the uninformed more similar to the informed in their choices (Lau et al., 2008; Lau et al., 2014). There is consistent evidence that the size of the choice set and the distinctiveness of the elements within it – in other words, the number of parties and the degree of polarization – can affect citizens' ability to vote in accordance with their ideological preferences (Kroh, 2009), or to vote correctly (Lau et al., 2008; Lau, 2014). In the previous chapter I replicated some of these findings and showed that simpler institutional arrangements aid the uninformed in emulating the behavior of their more informed peers. This does not necessarily mean that the uninformed make better decisions under such institutional circumstances. However, such a conclusion is more defensible and theoretically grounded than the alternative explanation that the quality of the choices of the informed would somehow deteriorate when the decisions are made simpler.

5.2. Variation of Information Effects on Attitudes

Considerably less attention has been given to the economics of political information in political attitude formation or in political behaviors other than voting, even though the role of political knowledge is well documented in the crystallization of political attitudes (Fiske, Lau and Smith, 1990) and in constraining the components of individual political belief systems (Converse, 2000; Zaller, 1992). This is rather unsurprising, for understandable reasons that I address further.

Cues serve the *function* of knowledge in citizens' decision processes, therefore they do not come in direct contradiction with the informational component common to virtually all decision-making theories (Kahneman et al, 1982). Likewise, the institutions that simplify electoral decisions do not remove the informational component altogether, they rather lower the threshold for correct decisions down to a level that is manageable by the less sophisticated segments of the population. Any conclusion denying a link between information and decisional outcomes would be at odds with the traditional understanding of the cognitive mechanisms of decision making. When it comes to political decisions in general, and voting in particular, there are even higher stakes involved. As democratic rule rests on the assumption that citizens act as guardians of their own political interests by monitoring the activity of their representatives and holding them accountable through elections, some factual information about the political reality or the government's performance must find itself reflected into citizens' votes in order for a regime to be rightly called a democracy. The functional necessity for an informational component in all decision-based behaviors, together with the view of accountability as requisite for democratic rule, make it unlikely to find no role (or a substantively trivial one) of knowledge in people's voting behavior. In contrast to political decisions, many attitudes, behaviors and dispositions either do not require an informational component, as their origins are largely affective, or they emerge as effects of factual information filtered through idiosyncratic affective filters (Way and Masters, 1996). This is why decisions can be characterized as correct or incorrect, to the extent that

they are consistent with a logically unbiased analysis of their informational input (Lau and Redlawsk, 1997), whereas attitudes and behaviors are not characterized in such terms.

This, however, is not necessarily the most apt position to take, as the literature on accountability and democratic support suggests that people's feelings towards the system reflect to some degree their objective political reality. Corrupt governments, for instance, generate frustration with the democratic process (Mishler and Rose, 2001), thus decreasing popular support for democracy. Effective government, understood as the successfulness of governments in carrying out their goals, is a strong predictor of the public's satisfaction with the regime: in established democracies, this translates into support for democracy and satisfaction with how democracy works, whereas in less democratic polities, effective government may even decrease support for democracy (Magalhães, 2014). In more general terms, people respond to the performance of their governments by withdrawing their support for the regime whenever governments fail to deliver desirable outcomes. High levels of unemployment, inflation and economic stagnation were previously found to weaken the popular support for democracy in Western Europe (Clarke et al., 1993). Unemployment and inflation were also found to depress satisfaction with democracy across the 15 countries of the EU prior to 2004 (Karp et al., 2003).

People appear to be particularly perceptive in their subjective evaluations of their governments (Lewis-Beck and Stegmaier, 2000). For instance, citizens are capable of making reasonably accurate evaluations of the economic performance of incumbent governments while factoring in contextual information such as global economic trends and fluctuations (Duch and Stevenson, 2010). Furthermore, their propensity to use economic evaluations correctly in their electoral decisions increases with their level of education and with the divergence of the domestic economic indicators from global trends (Duch and Stevenson, 2010). Hence, a well performing economy will be perceived as such by less sophisticated individuals if made apparent by macro-level, contextual factors. The simpler it is for citizens to correctly evaluate the economic performance of their government, the more they will make

use of economic evaluations in their electoral decisions.

5.3. Variation of Information Effects on Satisfaction with Democracy, Efficacy and Turnout

Previous chapters have demonstrated the existence of significant information effects on vote choice and on several attitudinal and behavioral outcomes other than the vote across a multitude of election studies. The cross-national variation of information effects on vote choice can be partly attributed to institutional differences between the sampled elections, as shown in Chapter 4 using two different approaches to the estimation of information effects. This chapter takes the natural step further and investigates the cross-country variation of information effects on the attitudinal and behavioral outcomes discussed in Chapter 3: satisfaction with democracy, political efficacy and turnout.

Provided that they are citizens of democratic countries, people have the right qualifications to participate politically (Lupia, 1994; Lupia, 1996) and the policies of their governments reflect the preferences of the electorate in one way or another. In a consolidated democracy, thus, it is most sensible for citizens to have a relatively strong sense of political efficacy. If a hypothetically fully informed democratic citizen devoid of emotion and flawless in their calculating abilities (*homo economicus*) were to be asked whether it makes a difference who people vote for, they would most likely answer in the affirmative after careful deliberation. Regular citizens, however, are never fully informed, and it is the interaction between their ignorance and their subjective experiences that governs their positive or negative evaluations of their governments. They can perceive the most democratic governments as unresponsive and unaccountable if their imperfect political knowledge is coupled with predominantly negative experiences with bureaucracy or with the political community.¹⁹ Conversely, a

¹⁹ Of course, an alternative explanation may be that they evaluate their governments in comparison to unrealistic standards, yet it can be argued that such standards are themselves driven by a lack of knowledge about what can reasonably be expected of a representative government.

largely lacunar knowledge combined with predominantly positive experiences with the establishment will likely lead to positive evaluations of their government's functioning.

To this end, I propose several institutional and aggregate-level characteristics of countries that are likely to enhance or hinder people's appreciation of their political community without directly affecting the democratic standing of the country in any significant way.

5.3.1. Population size

I argue that smaller political communities can facilitate the intuitive understanding of the political system, making it easier for the uninformed to emulate the political attitudes of the informed. The population size of political communities has been previously discussed in relation to democracy, with larger countries being generally less democratic (Dahl and Tufte, 1973). Attempts at explaining this relationship abound, from the increased homogeneity (Dahl and Tufte, 1973) and stronger sense of community of smaller countries (Anckar and Anckar, 1995) to the economic and security dependency of small countries on larger economies, as well as their increased likelihood of being former colonies of present day democracies (Veenendaal, 2015)²⁰. Diamond and Tsalik (1999) suggest that one of the mechanisms linking size and democracy may be via the negative effect of population size on political efficacy, as larger jurisdictions have more complex bureaucracies that make it harder for citizens to grasp (Lassen and Serritzlew, 2011), and they also reduce the probability of single votes to be pivotal.

None of the studies mentioned above considers political knowledge as a relevant factor in the causal chain, though it may be that smaller countries garner higher levels of efficacy by engaging the less sophisticated citizens that would otherwise feel excluded from larger-scale politics. As a chance to cast a pivotal vote of one in a million is essentially equal to a chance of one in ten million in its

²⁰ Veenendaal (2015) suggests that the relationship between size and democracy may be nonexistent, arguing that small states are only formally more democratic, due to their dependency on the approval of larger states.

effective empowerment of citizens, it is fair to assume that whatever drives the increase in political efficacy in citizens of small countries is not their direct experience with influencing electoral outcomes. Were they to base their feelings of efficacy on their chance to cast a pivotal vote, they would unanimously agree that their power to influence politics is essentially nil (Riker and Ordeshook, 1968).

There is more leverage to the non-rational explanations of the phenomenon. As the population size of a country increases, the uninformed find it harder and harder to make sense of bureaucracy (Lassen and Serritzlew, 2011); this does not necessarily make smaller countries more democratic, but it is bound to increase popular support for the regime. A stronger sense of community on behalf of the citizenry can translate into an objectively more democratic polity (Anckar and Anckar, 1995), but it is more likely to contribute to citizen support for the regime instead. Considering that the average human would keep contact with a social milieu consisting of no more than 150 individuals (Dunbar, 1993), reflecting the approximate premodern size of homo sapiens groups, it is reasonable to expect political communities of less than 150 individuals to be best at generating political engagement and a sense of efficacy among their members. In communities of 150 people, virtually everyone is personally acquainted with their political leaders; in communities of 150^2 or 22,500, virtually everyone has a friend who knows their political leaders personally; in communities of 150^3 or 3,375,000, everyone has a close acquaintance whose friend keeps in contact with their political leaders. Had this number not been approximate, it could be argued that the citizens' sense of political empowerment should decrease with population size in steps of 150, yet in reality the steps are likely to be a lot more diffuse. The prediction that remains testable, though, is that population size will not only have a linear effect on people's feelings of political efficacy and their support for democracy, but rather a logarithmic one, reflecting the exponential progression discussed above. We can expect stronger information effects on political efficacy and support for democracy in more populous democracies, as political empowerment in such countries is rather learnt than felt.

5.3.2. Polarization

It has been argued that party system polarization can burden legislative processes (McCarty, 2007), destabilize democracies (Valenzuela, 1978), and hinder economic performance (Lupu, 2015). At the same time, polarization is also associated with stronger partisan feelings in the electorate, as citizens find it easier to distinguish between parties when the ideological distance between them increases (Lupu, 2015). As the subjective benefits of voting increase and the information costs of electoral decisions decrease, turnout is higher in elections with polarized party systems (Lachat, 2008). This is fully consistent with a theory of polarization as a device that facilitates cognitive shortcuts in citizens' decisions and attitudes, because it increases citizens' political engagement and participation despite being usually associated with poorer economic, legislative and democratic performances. Even the more unsophisticated citizens of polarized systems understand the stakes of the democratic game, they can relate to the candidates and parties in the electoral competition and they express their support for civic institutions through higher levels of political participation. I hypothesize that polarization, understood as the weighted spread of political parties in a given ideological space (Lachat, 2008), can reduce the positive effect of political knowledge on citizen's feelings of political efficacy, their satisfaction with democracy and their electoral participation. The more polarized a party system is, thus, the more similar the political sophisticates will be to their less informed peers with regard to their participation and attitudes towards the system.

5.3.3. Number of Parties

In systems with a large number of parties, citizens are more likely to be able to identify parties or candidate that closely match their policy or ideological preferences. At the same time, small parties generally have little power to influence policy agendas, as they are often not hold majorities in governing coalitions. Losers of electoral competitions are generally less satisfied with democracy

compared to winners (Anderson and Guillory, 1997), especially in majoritarian systems (Anderson and Guillory, 1997; Aarts and Thomassen, 2008), where small parties have little voice (Lijphart, 1999). A high degree of fragmentation of the party system leads to large segments of the citizenry being neither winners nor losers of the electoral competition, thus making it harder for the unsophisticated voter to get affectively invested in the electoral outcome. As large numbers of people lack effective power to influence policies or affect government formation, multiparty systems tend to generate apathy and low turnout rates (Jackman, 1987). All other things being equal, citizens of countries with a large number of political parties are likely to require more knowledge of politics to appreciate the democratic qualities of their polity. I thus hypothesize that the larger the effective number of parties, the stronger the information effects on efficacy, turnout and satisfaction with the working of democracy.

5.3.4. Federal-Unitary Dimension

The impact of political knowledge on people's attitudes towards a democratic system depends on the extent to which the qualities of the system lend themselves to the public's understanding through the learning of facts. The structure of the legislative branch is particularly relevant in this regard, as bicameral parliaments tend to produce policy outcomes that are hardly predictable even by the most informed citizens (Tsebelis, 2002). The unpredictability of political outcomes is likely to frustrate or even alienate those segments of the population that do not have a good understanding of checks and balances and their role in the stability of democratic regimes. A similar effect is expected for any institution that can encumber the attribution of responsibility by the populace to the relevant political authorities. As suggested in Chapter 4 as well, federalism and fiscal decentralization may also increase the complexity of governments beyond the level of understanding of the average citizen, thus increasing the behavioral and attitudinal gap between the knowledgeable and the less knowledgeable.

To the uninformed citizen, bicameral parliaments, federalism and fiscal decentralization may seem like hindrances to effective governance and a waste of public resources, whereas an informed citizen may be better equipped to understand its utility. These three variables, as shown previously in this thesis, correspond to the federal-unitary dimension proposed by Lijphart (1999) to characterize democracies. We thus expect stronger information effects on support for the system and political efficacy in polities with high scores on the federal-unitary dimension.

5.4. Data and Methodology

As in the previous chapters, all empirical analyses in this essay are run on the Comparative Study of Electoral Systems (CSES), modules 1, 2, and 3. For the purpose of this study, two criteria of case selection were employed. First, some election studies were excluded due to the unavailability of data on one or more variables of interest: the three political knowledge variables, the two political efficacy variables, satisfaction with democracy, turnout, income or education. In election studies where religiosity, marital status, union membership, or number of people in household had no valid observations, the missing values were replaced with a random sample of values from the other election studies. On education and income, in polities where at least some valid observations were found, the unit nonresponse data were replaced using multiple imputation, and five separate databases were created with the imputed values for education and income. The pooled imputed data are used throughout the analysis, as described in the previous chapter.

The second case selection criterion was the undeniable democratic status of the sampled countries in a continuous fashion after the end of World War II, which is justified by this essay's central claim that positive attitudes towards the system can be obtained by means of a factual assessment of its performance. Appendix IV contains a full list of the election studies included in the analysis (39

elections).

The macro-level variables were retrieved from World Bank estimates (population size), estimated from CSES data (the effective number of parties, the dummy distinguishing between list PR systems and the rest, party system polarization), or taken from the data collected by Vatter and Bernauer (2013) to describe CSES polities along Lijphart's (1999) classification of parliamentary democracies (bicameralism, federalism, fiscal decentralization).

Finally, several options were available for measuring polarization. The Dalton index measures the degree of divergence of political parties from a theoretically specified ideological center, and it returns maximum levels of polarization for countries where all parties take extreme positions on the scale, and minimum only when the parties are concentrated in the middle of the ideological scale (Dalton, 2008). In contrast, Lachat (2008) and Vegetti (2014) use a measure of polarization that only takes into account the weighted distance between parties, following the formula below (1), also described in the previous chapter. This approach is likely better suited for the purpose of this essay, as we are interested here in people's ability to distinguish among political parties in their polity, regardless of the overall left- or right- leaning of the party system.

$$P = \sum (\bar{x} - x_i) * w_i \quad (1)$$

Where x_i represents the position of party i , \bar{x} is the ideological center of a polity and w_i is the percentage of votes won by party i .

5.4.1. Information effects: two operationalizations

The effect of political knowledge (the count of correct answers given by each respondent to the three knowledge items present in each election study) on turnout, political efficacy and satisfaction with democracy is estimated using two different operationalizations. First, the outcomes of interest are

regressed on political knowledge and a number of socio-economic variables; the information effect we are interested in is the slope of political knowledge in each polity.

The second operationalization of information effects uses simulation models for estimating the net effect of knowledge on the outcome, following Bartels' (1996), Delli Carpini and Keeter's (1996), and Althaus' (1998) method, as described in the previous chapters. The outcome of interest is regressed on political knowledge, socio-economic variables, and all the two-way interactions between political knowledge and the other variables in the specification. The size of the information effect, under this operationalization, is no longer given by the slope of political knowledge, but rather by the sum of all the indirect effects and the direct effect of knowledge on the dependent variable. The difference between the average expected value of the dependent variable under conditions of maximum and minimum information for all respondents represents the information defect. The method is analogous to the one employed in the previous two chapters, where more detailed descriptions of the method are presented. The average of ΔY in the equation (2) below gives the magnitude of the information effect in each polity:

$$\Delta Y_i = \max(K) * \left(\beta_1 + \sum \delta_j V_{ij} \right) \quad (2)$$

Where K is the political knowledge variable; V_{ij} is respondent i 's score on the j^{th} socio-economic variable V ; and α , β and δ are parameter estimates.

5.5. Results

For the first stage of the analysis, I fit regression models for each of the four individual level outcome variables: turnout to vote, satisfaction with democracy, internal and external political efficacy. The predictors are political knowledge and socio-economic controls such as education, income, age, gender, marital status and employment status. For the model explaining vote turnout, a logistic link function

was used, whereas all the other models were fitted without a link function. All variables were unit standardized, including the logged population size. The formal presentation of the individual level models is printed below.

$$P(\text{Turnout}=1) = \alpha + \beta_1 K_i + \sum \beta_j V_{ij} + \varepsilon_i \quad (3)$$

$$\text{Satisfaction with democracy} = \alpha + \beta_1 K_i + \sum \beta_j V_{ij} + \varepsilon_i \quad (4)$$

$$\text{Internal political efficacy} = \alpha + \beta_1 K_i + \sum \beta_j V_{ij} + \varepsilon_i \quad (5)$$

$$\text{External political efficacy} = \alpha + \beta_1 K_i + \sum \beta_j V_{ij} + \varepsilon_i \quad (6)$$

where K_i is the level of knowledge for respondent i ; V_{ij} is respondent i 's score on the j^{th} socioeconomic variable V ; α and β are parameter estimates and ε_i is the prediction error for respondent i .

In each election study, each respondent was given at random a unique probability (between 0 and 1) of being selected in the sample to which the models were fitted. In order to keep the standard errors relatively unbiased, the size of the samples was kept the same as that of the original data (1/5 of the pooled imputed data). Some cases were selected several times, some were not selected at all, rendering the sampling procedure analogous to a random weighting of the data.

After fitting the four models to a sample from each election study, the resulting β_1 coefficients (the slopes of political knowledge for each election study) were correlated with the macro-level variables discussed above. These correlations show how the direct effect of political knowledge on turnout, satisfaction with democracy and political efficacy is associated with the macro-level characteristics discussed in the previous sections of this chapter. Information effects were also computed from models in which all socioeconomic variables were interacted with political knowledge,

by applying the formula in equation (2) presented above. These correlations represent the association between the total effect of knowledge on the outcomes of interest and the macro-level variables previously discussed. The empirical distribution of each of these coefficients was generated by repeating the procedure over 1,000 resamples, and the significance of the estimates was computed using their observed standard deviations, also reported in parentheses in Table 5.1 below. The bivariate correlations with direct effects are reported in the first section of Table 5.1, whereas the correlations with total effects are found in the third section.

It is conceivable that some of the correlations may be spurious. To address this concern, I fit regression models whereby information effects are regressed on all four institutional factors. The results for both the “direct effect” and the “total effect” operationalizations are reported in Table 5.1, in section two and, respectively, section four.

Table 5.1: Variation of Information Effects (Two Operationalizations) by Macro-level Factors

		On turnout	On satisfaction	On internal political efficacy	On external political efficacy
DIRECT EFFECT	Number of parties	-0.03 (0.15)	-0.06 (0.08)	-0.09 (0.09)	-0.11 (0.09)
Bivariate (correlations)	Polarization	-0.20 (0.18)	-0.11 (0.08)	-0.35* (0.11)	-0.21* (0.10)
	Federal-unitary	-0.04 (0.17)	0.37* (0.08)	0.10 (0.11)	0.05 (0.12)
	Population size (log)	-0.10 (0.09)	0.05 (0.08)	0.34* (0.08)	0.18 (0.10)
DIRECT EFFECT	Intercept	6.49 (7.31)	0.01 (0.02)	0.02 (0.02)	0.00 (0.02)
Multivariate (OLS coefficients)	Number of parties	-0.24 (0.29)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Polarization	-3.84 (4.74)	-0.01 (0.03)	-0.02 (0.01)	-0.00 (0.01)
	Federal-unitary	-0.54 (0.48)	0.02* (0.00)	0.00 (0.00)	0.00 (0.00)
	Population size (log)	-0.22 (0.24)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
TOTAL EFFECT	Number of parties	0.19* (0.06)	-0.05 (0.08)	-0.10 (0.09)	-0.04 (0.10)
Bivariate (correlations)	Polarization	-0.09 (0.05)	-0.12 (0.09)	-0.36* (0.10)	-0.22* (0.11)
	Federal-unitary	-0.10 (0.06)	0.36* (0.08)	0.13 (0.12)	0.01 (0.13)
	Population size (log)	0.10 (0.06)	0.03 (0.08)	0.33* (0.08)	0.22* (0.11)
TOTAL EFFECT	Intercept	-0.11 (0.08)	0.02 (0.07)	0.08 (0.08)	0.03 (0.08)
Multivariate (OLS coefficients)	Number of parties	0.02* (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Polarization	-0.02 (0.03)	-0.01 (0.03)	-0.08 (0.04)	-0.02 (0.03)
	Federal-unitary	0.00 (0.02)	0.07* (0.02)	0.01 (0.02)	-0.01 (0.02)
	Population size (log)	0.01* (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)

* p < 0.05

5.6. Discussion

A positive effect of political knowledge on individual level turnout, political efficacy and satisfaction with democracy was found in all polities, which corroborates the premise of this paper that positive behaviors and attitudes towards the system can be reflective of residence in responsive and accountable political communities. The enlightened constituency (Althaus, 1998) in consolidated democracies is supportive of the system, tends to participate politically and feels capable of influencing the policies of a responsive government. The exception to this tendency is found in Austria, 2008, where higher levels of political knowledge appear to significantly reduce the respondents' satisfaction with democracy. I attributed this, in chapter 3, to the rise of the radical right prior to the Austrian legislative elections of 2008, when the BZÖ and FPÖ doubled their electoral fortunes, subsequently securing more than a quarter of the national legislature for the populist right. The informed voters of such parties are likely to be critical of the way democracy works, and the rest of the electorate may consider the popularity of such parties worrisome from a democratic point of view. Excluding the Austrian sample from the analysis, however, does not have any notable effect on the reported parameter estimates.

The results found with the two different operationalizations of information effects are remarkably similar in sign and magnitude, with few exceptions. Let us first consider the correlations between the macro-level variables and the effects of knowledge on the four outcome variables, thus the bivariate relationships with the direct and total information effects. The direct effects of knowledge on turnout do not correlate significantly with either of the institutional variables, whereas the total effects correlates significantly with the effective number of parties. Regardless of the operationalization that we may prefer, federal countries appear to have stronger information effects on satisfaction with democracy, and polarization is associated with weaker information effects on political efficacy. The effects of knowledge on political efficacy also tends to increase with population size, although the correlation does not reach conventional levels of significance in the case of external efficacy when the

direct effect of knowledge is considered. All the correlations found with the direct effect operationalization are identical to the ones found with the total effects, but the latter revealed two additional significant associations: between the number of parties and the information effect on turnout, and between population size and the information effect on external efficacy. All the significant correlations are in the predicted direction.

Considerable similarity between the two approaches is found with the two-step multilevel models as well. None of our macro-level variables could account for any significant amount of variation in the information effects on political efficacy, regardless of how information effects were estimated. Both operationalizations show stronger information effects on satisfaction with democracy in federal countries, in full agreement with the theoretical expectations. The only difference between the two operationalizations is found with the models where the information effects on turnout serve as response. Here, larger population sizes as well as multipartism are found to be predictive of higher magnitude total information effects. These effects could not be found with the simpler operationalization.

The evidence presented in this essay provides some support for the ability of political institutions and country characteristics to aid the uninformed in emulating the attitudes and behaviors of the informed, and contributes to a broader understanding of the importance of political knowledge in generating desirable democratic outcomes. Moreover, it brings further support for the advantage of the Bartelsian simulation approach over simpler operationalizations of information effects, suggesting that indeed, the influence of political knowledge on various outcomes is often not direct. However, there is surprising agreement between the multivariate performance of information effects obtained with the simplest method (the slopes of political knowledge in regression models) and that of information effects estimated with the much more complex simulation. The weakest predictors of information effects were only found with the simulation method (the “total effects” models), but the

hunt for statistical significance should probably yield to concerns about substantive significance in such cases.

At the end of the previous chapter, I acknowledged the exceptionality of vote choice as a response variable for simulations of information effects, arguing that we have no clear theoretical expectations regarding the relationship between political knowledge and voting for any political party. It follows that an atheoretical approach to modeling information effects, such as the simulation technique discussed throughout this thesis, would be particularly useful in modeling effects on vote choice, but potentially less useful when clear theoretical expectations are present. The analyses presented in this chapter are tests of directional hypotheses, where political knowledge was expected to be associated with the dependent variables in specific ways, guided by theoretical expectations that are laid out before any empirical test was performed. The resulting information effects are then used in testing macro-level theories that were also specified in advance. In other words, this essay offer a test of the assertions made in the previous chapter regarding the superiority of the simulation model. What I find is that the superiority of the simulation method is observable even for directional hypothesis tests, yet the advantages remain remarkably small in most cases. The effects estimated with the interactive simulation models are more efficient than those found with the simpler method, but the majority of the significant correlations between total information effects and macro-level variables were also found with the direct effect operationalization.

CHAPTER 6: CONCLUSIONS

This thesis investigated the probable causes of the varying impact of citizens' political knowledge on multiple outcomes of great importance to the functioning of electoral democracies. To this end, I measured the effects of citizens' political knowledge on their vote choice, turnout, satisfaction with democracy, internal and external political efficacy, across a wide range of institutional settings. In doing so, theories ascribing pivotal relevance to political literacy as well as those asserting that contextual factors can successfully mitigate the perils of political ignorance were examined and vindicated.

This was achieved by showing that the effects of citizens' political knowledge on their democratic behaviors and attitudes can easily be understated due to unreliable measurements. Political knowledge has stronger effects on a more eclectic set of outcomes and in a broader range of contexts than previous evidence would imply. There is nonetheless an impressive amount of variation in the magnitude of information effects across the many electoral democracies in the world, and some of this variance can be attributed to the institutional designs and country-level properties that shape the attitudinal and behavioral environments of democratic citizens. The mechanisms by which such macro-level factors influence the impact of political knowledge on citizens' pro-democratic attitudes and behaviors closely resembles the operation of cues as discussed in the previous literature (Boudreau and Lupia, 2011). The findings that support these broad conclusions are summarized in the paragraphs that follow, in the order in which they unfolded in the dissertation.

6.1. Summary of Findings

It is hard to find a valid justification for representative democracy if information about people's political reality is not reflected at least to some extent in their participatory acts, or in their attitudes towards their polity. If people's actions and beliefs are not constrained by the surrounding reality, they cannot be expressions of the real political interests of the individual, and they cannot constitute a basis for political representation. Were this so, democracy would be a meaningless concept. Such a bleak conclusion is not supported by the extraordinary evidence that such extraordinary claims would necessitate, which leads us to suspect that methodological reasons may underlie the occasional elusiveness of information effects. Using data from the three modules of the Comparative Study of Electoral Systems (CSES), this dissertation shows that low measurement reliability reduces the size of correlations between political knowledge and its common covariates, often rendering information effects statistically insignificant. I find that measurement reliability is mostly a product of good decisions at the level of questionnaire design: open ended questions (with no response options given to the respondent) about the names of public officials and their offices generally perform better than other questions.

As most research in comparative politics and public opinion is conducted using secondary data, the low reliability of existing political knowledge measurements may seem very worrisome, limiting researchers to testing tautological theories or endogenous effects. However, as I demonstrate in this thesis, simulation models can alleviate the effects of measurement noise to such extent that the impact of alpha reliability on the magnitude of information effects measured with simulation models is indistinguishable from zero. Using fictitious data I show that this finding is not limited to CSES data, but it is rather a consequence of the methodology employed.

Using the simulation method, I show that political knowledge has a significant effect on vote choice in 82 out of 84 elections considered in the analysis. These effects range from a mere 4%

expected change in vote choice induced by a simulated increase in political knowledge in the Irish legislative elections of 2002, to over 60% in the Estonian elections of 2011, or the Ukrainian elections of 1998. These differences are partly explained by the simplicity of the decision task, which is likely to depend both on individual characteristics and on institutional contexts. In the average polity, roughly one third of the electorate would change their vote upon a maximum increase in their level of political knowledge. The more complicated a decision task, the more consequential political knowledge is expected to be. I find, indeed, that information effects on vote choice are largest in elections where a large number of parties are competing on party lists, and electoral alliances have formed, thus blurring the link between party labels and their expected legislative behavior. Party system polarization was also hypothesized to reduce the magnitude of information effects, as political parties or candidates can be more easily distinguished from each other in polarized systems, but the evidence found is insufficient. All in all, it appears that the uninformed are more capable of emulating the electoral behavior of their more informed peers whenever the decision task at hand is simpler.

Finally, following the same assumption that citizens' attitudes and behaviors are (crude) reflections of their objective political reality, I show that political knowledge is associated with higher levels of political efficacy and more satisfaction with democracy in countries that have successfully maintained a strong democratic standing in a continuous fashion after the end of World War II. Knowledgeable individuals are also more likely to participate in elections in such countries, thus further legitimizing the system. Not surprisingly, there is considerable variation in the magnitude of information effects across consolidated democracies. I proposed a theory according to which people can develop positive attitudes towards the system either by learning its virtues, or by having an affective attachment to their political community. I argue that positive experiences in their interaction with the state apparatus, the ability to relate to their political elites, together with a stronger sense of community will help uninformed individuals emulate the attitudes and behaviors of their more

informed peers. I demonstrate that the positive returns from political knowledge for political efficacy are weaker in small, unitary countries with polarized party systems, partially corroborating the theoretical expectations.

6.2. Limitations

The analyses presented in this dissertation are certainly open to legitimate criticism. The reliability of political knowledge scales was estimated with Cronbach's Alpha, Loevinger's H, as well as a modified version of Cronbach's Alpha constructed from inter-item polychoric correlations. The working assumption throughout the dissertation was that it is always desirable to have scales with higher reliability estimates. This, however, need not be the case, as there may be conditions under which a reliability estimate grossly overestimates the true reliability of a scale. In Chapter 2, I report strong effects of skewness and kurtosis on the reliability estimates, with skewed and leptokurtic knowledge score distributions generating higher estimates of reliability compared to normal distributions. These effects are no longer evident when reliability is measured with Loevinger's H instead of Alpha, making it plausible that the former overestimate the reliability of skewed and leptokurtic scales. Nevertheless, the potential bias of Alpha does not appear to affect the results of subsequent analyses, as its effects are in full agreement with theoretical expectations²¹, and its performance was successfully replicated on fictitious data simulated at the end of Chapter 3.

The models used for computing information effects may also attract legitimate criticism, for several reasons. First, the models are admittedly underspecified, as only demographic variables and political knowledge are used for predicting vote choice, turnout, satisfaction with democracy and political efficacy. There are a number of other variables known to be predictive of these outcomes (retrospective economic evaluations, partisanship, various issue positions, etc.), some of them available

²¹ Most notably the attenuation of regression slopes

in the CSES data, but omitted from the analyses in this manuscript. These omissions represent the greatest compromise that had to be done to ensure the comparability of results across polities while maximizing the number of election studies in the analysis. Bootstrapping may have mitigated this shortcoming to some extent, but a more complete specification would undeniably be preferable. Second, it is important to note that the simulated information effects were computed by plugging higher values of political knowledge into the regression equation fitted to the real data, thus making the implicit assumption that the models are robust with regard to the range of the data they are fitted to. This assumption is often violated in simulation studies (King and Zeng, 2007), leading to biased results. My counterargument is that the bias can be minimized by using short scales for the treatment variable, where the extreme values are observed at considerable frequencies, as in the data used throughout this thesis²². Finally, the models used for computing information effects violate several assumptions of regression analysis, most notably collinearity, joint normality and homoskedasticity (Fox, 1984), as political knowledge is interacted with every variable in the model with no prior theoretical considerations. This renders the parameter estimates returned by the models virtually uninterpretable, but it still allows us to compute predicted values of the response variables for different levels of political knowledge, which is precisely the quantity we are interested in.

Another limitation of the study lies in the non-independence of observations in the multilevel models. Two levels of observation were considered in the analysis, a lower level consisting of individuals, and a macro-level pertaining to election studies. Several countries were observed over two or even three elections, whereas others were only observed once. The nesting of election studies within countries was not accounted for in any of the analyses. Furthermore, it is worth noting that the observations in the sample span from 1996 to 2011, therefore an additional nesting of observations within time could have been accounted for. However, notwithstanding the plausible appropriateness of

²² The minimum score was observed in 16% of the pooled sample, the maximum score on 24%

the resulting 4-level cross-classified model, the nesting units would have been very unbalanced, potentially offsetting all the benefits of having a correctly specified model.

Several theoretical limitations are worth noting. The *simplicity of decision tasks* is a broad concept that is certainly not fully grasped by the several institutional variables discussed throughout the chapters of this monograph. While the proxies used - polarization, effective number of parties, electoral system, candidacy by coalitions, etc.– represent credible dimensions of simplicity, their validity as operationalization of the construct is merely tentative at this stage. The same criticism can be put forth regarding the operationalization of the emotional substitutes of knowledge, proposed in this dissertation as aides in the emulation of enlightened attitudes and behaviors by less knowledgeable citizens. I propose population size as a country-level indirect measure of sense of community (negative effect) and familiarity with state bureaucracy, and I use the unitary-federal divide to tap into a government's layered structure. The latter, I argue, is an indirect measure of how removed the individual is likely to feel from the political decisions that affect them. Arguably, there is a plethora of other institutional properties of polities that can enhance popular attachment to the system by non-rational means, and the ones proposed in this dissertation are but a small subset of the plurality of possibilities.

Finally, it is important to consider that the conclusions of this manuscript capitalize on the ability of statistical tools to infer within-case effects from across-cases designs. Our institutional observations vary across countries, not within. The conclusions that we want to draw, however, refer to expected changes in information effects for polities that would hypothetically change their institutional makeup in a particular way. Ideally, such research questions would be addressed using longitudinal data on a number of countries, but this is rarely feasible. In the case of most research endeavors, including this one, there is not enough data available for a credible longitudinal approach.

6.3. Contribution to the Literature on Information Effects

This dissertation makes at least two noteworthy general contributions to the literature on political knowledge and public opinion. The first is a methodological one, as it compares two competing operationalizations of information effects and demonstrates the superiority of one approach over the other in a series of successful trials. The second contribution is a more substantive one, and it involves formulating a theory that can explain part of the variation in information effects from one election to the next, and corroborating it with empirical evidence from a large number of election studies across the globe. There are multiple specific contributions that I will summarize in the following paragraphs.

This dissertation starts by raising concerns about the quality of survey based measures of political knowledge. It finds that low reliability is indeed consequential, limiting the range of true phenomena that can be observed with standard statistical tools. It identifies good practices in survey design that can radically boost the reliability of subsequent measurements, and points to some bad practices that amount to hikes in random noise. These findings, if applied by pollsters interested in tapping into subjects' level of political literacy, can contribute to a vitalization of the field of research concerning political knowledge, by enabling researchers to test an increasingly eclectic array of theories.

Even more enabling is the use of simulation models that allow for multiple interactions between political knowledge and all other variables in the model specification. Such models have been proposed before (Bartels, 1996; Delli Carpini and Keeter, 1996), but their relation to the inefficiency of error-ridden measurements has not been previously discussed. Simulated information effects are more valid than simpler operationalizations of the same concept, as they take into account a plurality of pathways through which political knowledge operates. This has been discussed before (Zaller, 1992; Althaus, 1998); what this dissertation finds is that simulated information effects are also considerably more reliable than the direct effects of knowledge on multiple outcome variables. The difference between the

two approaches is so dramatic that 40% of the significant information effects on vote choice found with the simulation method could not be distinguished from zero when the simpler operationalization of information effects was used.

This manuscript contains the most comprehensive analysis of information effects and their cross-country variation to date. The relatively large number of election studies included in the analyses allowed us to demonstrate the effects of political institutions and country-level characteristics on the varying importance of political knowledge across countries and elections. We learn that political institutions can streamline citizens' cognitive efforts in the making of electoral decisions. Additionally, this dissertation shows that certain institutions and macro-level characteristics can reduce the gap between the informed and the uninformed in their political attitudes and behaviors. I find that political knowledge is less consequential for vote choice in elections where the electoral decision task is simplified by characteristics of the polity and its party system – such as high levels of polarization, few political parties, single party governments, and candidate-centered elections. Citizens are viewed as receptive of their objective political reality to various degrees; their level of satisfaction with democracy, their perception of the government's accountability and responsiveness, as well as their propensity to legitimize the system through political participation, must depend on the political reality in which they dwell. However, political institutions and country-level characteristics can help the uninformed emulate the attitudes of their more informed peers by enabling them to acquire pro-democratic attitudes and behaviors by affective means. In a manner akin to the aforementioned cues, I find that party system polarization, a relatively small population size of the country as well as a low degree of federalization are associated with weaker information effects. These findings broaden the general understanding of cues, as they have heretofore been reserved to the context of decisions, particularly in vote choice.

6.4. Implications for Political Representation and Democracy

The research presented in this dissertation testifies to the nontrivial impact of political knowledge on vote choice, political participation, satisfaction with democracy, and political efficacy in a majority of electoral democracies across the globe, therefore demonstrating that people's behaviors and attitudes are at least partially contingent upon their correct perception of their political reality. However, this does not necessarily restore credibility to the representative model of democracy, as other hazards can emerge from having political behaviors and attitudes rooted in societal information asymmetries.

Political knowledge often covaries with demographics and other traits worthy of representation. Men and older people with higher incomes or higher levels of education tend to be more knowledgeable than the average citizen, and if one's political literacy is predictive of one's propensity to participate politically, then old people, men, the educated and the affluent end up being overrepresented in the ranks of the politically active. To the extent that policies are rooted in people's political interests as expressed through participatory acts or opinion polls, asymmetries in knowledge contribute to an exacerbation of the political advantages of high socio-economic status individuals. The prevalence of significant direct effects of political knowledge on the behaviors and attitudes studied in this thesis lends credence to this conclusion.

A considerable portion of the impact of knowledge on turnout, vote choice, political efficacy and satisfaction with democracy is indirect, as a moderator of demographic effects. This shows that political knowledge acts as a crystallizer of political interests, channeling the demographic or socio-economic characteristics of citizens towards political expressions such as vote choice or turnout. This phenomenon has subtle yet substantively meaningful effects on political representation. The politically knowledgeable are better able to act in accordance with their best political interests, whereas the actions and attitudes of the less knowledgeable are but noisy reflections of their interests and needs. When aggregated, the actions and attitudes of the informational underdogs can cancel each other out,

whereas those of the more knowledgeable end up all but synonymous with public opinion. The distribution of political interests within the participatory population becomes equivalent to a noise-laden distribution of political interests in the more knowledgeable segment of the same population, thus rendering representative democracy functionally equivalent to rule by the knowledgeable. A democracy with strong information effects on political behaviors and attitudes is an unrepresentative democracy.

An uncomfortable conundrum emerges, as I concluded that democracy requires that a correct understanding of a citizen's political reality should inform her behaviors and attitudes, but at the same time her knowledge must bear no political consequences lest political equality be compromised. As argued in this dissertation, solutions exist. One can arrive at a reasonable evaluation of political reality without actually holding any information about it, by mimicking the behavior or attitudes of better informed peers, or by taking good cognitive shortcuts. Alternatively, the elements in the political environment that should inform one's behaviors and attitudes may be so easily accessible, perceptually (unlimited availability of information) and cognitively (no higher faculties or skills required for understanding relevant political facts), that virtually every citizen performs in an informed way in most situations. Under these conditions, behavioral and attitudinal expressions or political preferences remain rooted in citizens' objective political reality, but knowledge has little to no impact on them.

By investigating the sources of cross-national variation in information effects, my thesis identified some of the circumstances under which political ignorance is least disenfranchising. The polities where information effects are weakest are not necessarily the countries with the highest quality of democratic governance. The institutions that reduce information effects are often the ones associated with the majoritarian model of representative democracy: few political parties, unitary government, majoritarian (or mixed) electoral systems, single party cabinets or minimum winning coalitions. It is unclear whether the democratic improvements associated with the near-absence of information effects can offset the shortcomings of majoritarianism. Hence, the research presented in this dissertation can

only constitute a weak endorsement of the institutional arrangements found to reduce information effects. There are more general guidelines that emerge from this study that can be considered by institutional designers, legislators, policymakers, party officials and electoral candidates, journalists and opinion leaders, if a bettering of democratic representation is sought.

6.5. Practical Considerations

The informational component in people's decision making needs to be as simple as possible, in order to limit the influence of knowledge asymmetries on political representation. One way of achieving this is by means of centrifugal electoral competition. The politically uninformed citizens of countries with higher levels of party system polarization often emulate the behavior and attitudes of their more informed peers, thus reducing the deleterious effects of knowledge on political equality. Electoral considerations underlie the centripetal strategy commonly observed in electoral democracies around the world, especially in party systems with two or two-and-a-half parties. As the promise of enhanced political equality is likely dwarfed by the prospective perquisites that public office begets, parties and candidates are unlikely to take positions off-center unless electorally advantageous.

The complexity of politics is certainly not limited to the ideological similarity between competing parties or candidates. Politicians gain considerable leeway from institutions that hedge their electoral risks whenever their performance in government is less than stellar. All accusations that opposition parties can formulate against a governing coalition can be dodged by deflecting responsibility towards other layers of government, or by blaming committees or commissions appointed at will. This makes it practically impossible to hold politicians accountable for most of their actions without extensive knowledge of the workings of the changing landscape of political institutions. Legislators and policy makers can improve the quality of political representation by adopting a more

reluctant attitude towards measures (such as institutional reforms) that may obscure their responsibility from the electorate. Such a strategy would effectively enfranchise low-information voters, which may be advantageous for some parties more than it would be for others.

The preferences of the informed diverge from those of the uninformed primarily in multiparty systems where electoral alliances exist, and in countries with PR systems. This further corroborates the idea that public officials can mitigate or exacerbate the perils of political knowledge asymmetries by institutional design or by electoral strategies. To finally address the question in the title of the thesis, political knowledge sometimes matters, but the citizens are often not the only ones to blame when they hold ignorant views or display unintelligent behaviors.

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Appendix I

List of Politics Included in Chapter 2

CSES 1	CSES 2	CSES 3
1. Australia, 1996	1. Albania, 2005	1. Australia, 2007
2. Belgium (Flanders), 1999	2. Australia, 2004	2. Austria, 2008
3. Canada, 1997	3. Belgium, 2003	3. Brazil, 2006
4. Taiwan, 1996	4. Brazil, 2002	4. Brazil, 2010
5. Czech Republic, 1996	5. Canada, 2004	5. Taiwan, 2008
6. Germany, 1998	6. Switzerland, 2003	6. Croatia, 2007
7. Hong Kong, 1998	7. Chile, 2005	7. Czech Republic, 2006
8. Hungary, 1998	8. Czech Republic, 2002	8. Denmark, 2007
9. Israel, 1996	9. Germany, 2002	9. Estonia, 2011
10. Mexico, 1997	10. Spain, 2004	10. Finland, 2007
11. Mexico, 2000	11. Finland, 2003	11. France, 2007
12. The Netherlands, 1998	12. France, 2002	12. Germany, 2005
13. New Zealand, 1996	13. Great Britain, 2005	13. Germany, 2009
14. Norway, 1997	14. Hong Kong, 2004	14. Greece, 2009
15. Poland, 1997	15. Hungary, 2002	15. Hong Kong, 2008
16. Portugal, 2002	16. Ireland, 2002	16. Iceland, 2007
17. Romania, 1996	17. Israel, 2003	17. Iceland, 2009
18. Spain, 1996	18. Italy, 2006	18. Ireland, 2007
19. Spain, 2000	19. Japan, 2004	19. Israel, 2006
20. Sweden, 1998	20. Kyrgyzstan, 2005	20. Japan, 2007
21. Switzerland, 1999	21. Korea, 2004	21. Korea, 2008
22. Ukraine, 1998	22. Mexico, 2003	22. Mexico, 2006
23. Great Britain, 1997	23. The Netherlands, 2002	23. Mexico, 2009
24. United States, 1996	24. Norway, 2001	24. The Netherlands, 2006
	25. New Zealand, 2002	25. New Zealand, 2008
	26. Peru, 2006	26. Norway, 2005
	27. The Philippines, 2004	27. Poland, 2005
	28. Poland, 2001	28. Poland, 2007
	29. Portugal, 2002	29. Portugal, 2009
	30. Portugal, 2005	30. Slovakia, 2010
	31. Romania, 2004	31. Sweden, 2006
	32. Russia, 2004	32. Switzerland, 2007
	33. Slovenia, 2004	33. Thailand, 2007
	34. Sweden, 2002	
	35. Taiwan, 2001	
	36. Taiwan, 2004	
	37. United States, 2004	

Appendix II

Effects Estimated in Chapter 4

Information Effects on Vote Choice – Estimated Change in Vote Choice in Percentages

	Total (max)	Total Effect	Direct (max)	Direct Effect		Total (max)	Total Effect	Direct (max)	Direct Effect
Australia06	47*	33*	38*	33*	Philippines04	35*	23*	36*	17*
Belgium(FL)99	46*	26*	41*	22*	Poland01	56*	9*	28	6*
Canada97	25*	16*	22*	10*	Portugal02	34*	22*	48*	26*
Taiwan96	16*	8	17*	7	Portugal05	16*	12*	15*	8*
Czech96	42*	23*	30*	23*	Romania04	28*	7	18	6
Germany98	16*	13*	13	7	Russia04	16*	3	5	1
HongKong98	55*	13*	24	7	Slovenia04	29*	19*	31*	17*
Hungary98	21*	18*	17	10	Spain04	19*	17*	11	7
Mexico97	36*	12*	39*	12	Sweden02	19*	12*	19*	9*
Mexico00	12*	7	14	8	Switzerland03	54*	22*	54*	24*
Netherlands98	29*	20*	22*	12*	GreatBritain05	38*	31*	43*	24*
NewZealand96	24*	16*	24*	12*	UnitedStates04	38*	19*	49*	21*
Norway97	27*	16*	19*	14*	Australia07	16	9	20	9
Poland97	28*	13*	21*	10	Austria08	36*	15*	40*	15*
Portugal02a	30*	19*	44	24	Brazil10	46*	50*	45*	33*
Romania96	62*	31*	36*	31*	Croatia07	41*	14*	30*	10*
Spain96	22*	19*	19	11	Czech06	37*	12*	32*	11*
Spain00	47*	17*	20	7	Denmark07	39*	26*	33*	20*
Sweden98	25*	12*	16*	8*	Estonia11	61*	30*	62*	26*
Switzerland99	31*	17*	26*	14*	Finland07	48*	15*	59*	17*
Ukraine98	65*	29*	68*	29*	France07	15*	10	10	6
GreatBritain97	8	3	8	3	Germany05	29*	22*	29*	23*
UnitedStates96	29*	21*	31*	14*	Germany09	31*	22*	39*	23*
Australia04	24*	8*	18	6	Greece09	20*	11*	14	6
Brazil02	27*	20*	6	4	Iceland07	38*	26*	45*	23*
Canada04	35*	22*	41*	21*	Iceland09	23*	18*	38*	19*
Taiwan01	40*	10*	33	9	Ireland07	24*	24*	20	10
Czech02	42*	14*	33*	10*	Israel06	41*	23*	44*	18*
Finland03	38*	13*	36*	10*	Japan07	32*	24*	46*	30*
France02	32*	31*	25*	15	Korea08	36*	9*	25	6
Germany02	21*	20*	14	9	Mexico06	25*	10*	21	8
HongKong04	41*	37*	56*	28*	Mexico09	46*	11*	40*	10
Hungary02	30*	21*	34*	21*	Netherlands06	26*	11*	21*	10
Ireland02	36*	4*	6	1	NewZealand08	39*	30*	48*	25*
Israel03	63*	25*	62*	22*	Norway05	24*	17*	21*	11*
Italy06	48*	16*	41*	14*	Poland05	52*	29*	56*	31*
Japan04	27*	17*	26*	17*	Poland07	36*	5*	22*	7*
Korea04	51*	7*	51*	7*	Portugal09	27*	22*	27	22*
Mexico03	34*	12*	36	14	Slovakia10	30*	9*	22*	9*
Netherlands02	36*	22*	31*	18*	Sweden06	33*	21*	33*	17*
NewZealand02	24*	25*	11	7	Switzerland07	30*	14*	34*	15*
Norway01	37*	19*	43*	19*	Thailand07	30*	21*	8	11*

Appendix III

Macro-level Variables Used for the Factor Analysis in Chapter 4 and 5

Twelve macro-level variables collected by Vatter and Bernauer (2013) as consensus democracy indicators for the CSES polities, following Lijphart's conceptualizations in *Patterns of Democracy* (1999):

1. the effective number of parties, using Laakso and Taagepera's (1979) formula $N = 1 / \sum w_i^2$ with w representing the number of seats won by each party
2. a dummy identifying polities governed by oversized coalitions or minority coalitions,
3. a measure of executive dominance (0-18 scale),
4. the electoral disproportionality of the system – using Gallagher's (1991) formula $0.5 * \sum (v_i - w_i)^2$ where v represents the proportion of votes and w represents the proportion of seats won by each party,
5. an index of corporatism,
6. a 3-point scale of federalism,
7. a measure of fiscal decentralization,
8. bicameralism, measured on 4-point scale from unicameralism to strong bicameralism,
9. a 5-point scale of how easily the constitution can be amended,
10. an assessment of the degree to which laws can be reviewed by the constitutional court,
11. the independence of the central bank,
12. a rating of the degree to which the polity can be described as a direct democracy (0-9.5 scale).

For more detailed information on the coding and computation of these indicators see Vatter and Bernauer (2013).

Appendix IV

List of Election Studies Included in Chapter 5

Australia (1996); Belgium – Flanders (1999); Canada (1997); Germany (1998); Netherlands (1998); New Zealand (1996); Norway (1997); Sweden (1998); Switzerland (1999); Great Britain (1997); United States (1996); Australia (2004); Canada (2004); Finland (2003); France (2002); Germany (2002); Ireland (2002); Israel (2003); Italy (2006); Japan (2004); New Zealand (2002); Sweden (2002); Switzerland (2003); Great Britain (2005); United States (2004); Australia (2007); Austria (2008); Denmark (2007); Finland (2007); France (2007); Germany (2009); Iceland (2007); Iceland (2009); Israel (2006); Japan (2007); The Netherlands (2006); New Zealand (2008); Norway (2005); Sweden (2006)