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Quantitative Methods for the Social Sciences

A Practical Introduction with Examples in R

Second Edition

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Introduction

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Under what conditions do countries go to war? What is the influence of the 2008–2009 economic crisis on the vote share of radical right-wing parties in Western Europe? What type of people are the most likely to protest and partake in demonstrations? How has the urban squatters' movement developed in South Africa after Apartheid? What is the impact of the COVID-19 pandemic on conspiracy beliefs? There is hardly any field in the social sciences that asks as many research questions as political science. Questions scholars are interested in can be specific and reduced to one event (e.g., the development of the urban squatter's movement in South Africa post-Apartheid) or general and systemic such as the occurrence of war and peace. Whether general or specific, what all empirical research questions have in common is the necessity to use adequate research methods to answer them. For example, to effectively evaluate the influence of the economic downturn in 2008/2009 on the radical right-wing success in the elections preceding this crisis, we need data on the radical right-wing vote before and after the crisis, a clearly defined operationalization of the crisis, and data on confounding factors such as immigration, crime, and corruption. Through appropriate modeling techniques (i.e., multiple regression analysis on macro-level data), we can then assess the absolute and relative influence of the economic crisis on the radical right-wing vote share.

Research methods are the "bread and butter" of empirical political science. They are the tools that allow researchers to conduct research and detect empirical regularities, causal chains, and explanations of political and social phenomena. To use a practical analogy: a political scientist needs to have a toolkit of research methods at his or her disposal to build good empirical research in the same way as a mason must have certain tools to build a house. It is indispensable for a mason to not only have some rather simple tools (e.g., a hammer), but also some more

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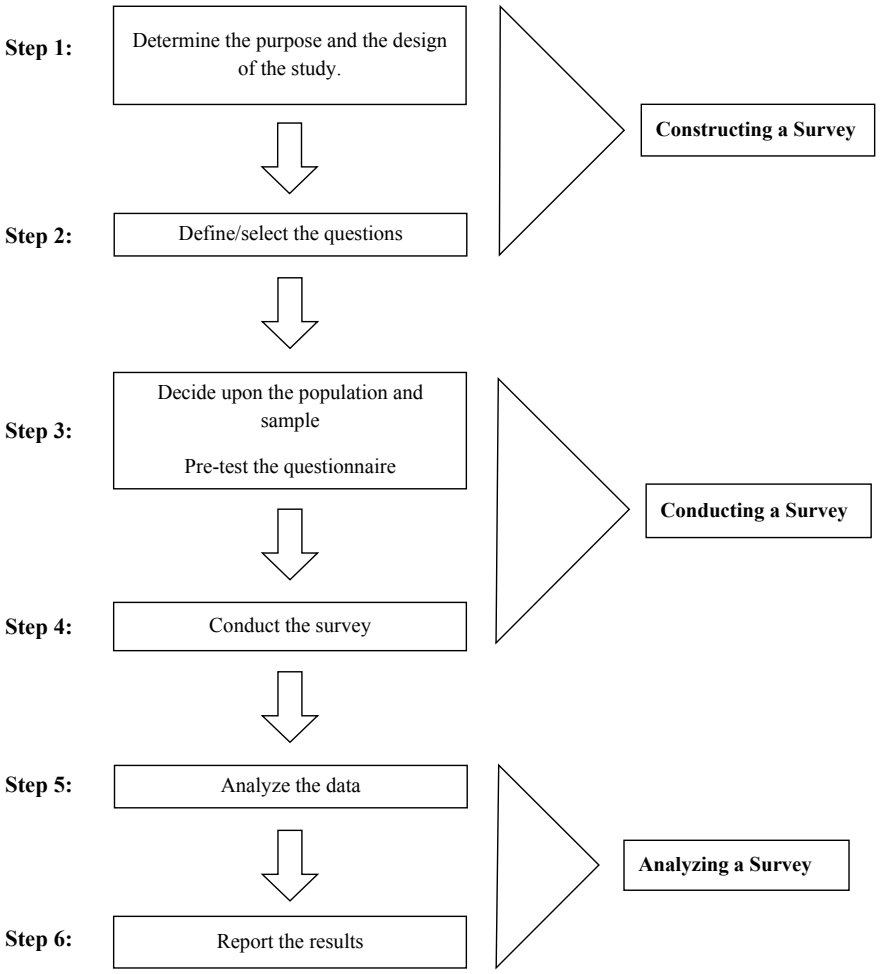

Fig. 1.1 Different steps in survey research

measures the amount of money students spend partying. It is an original survey including the original data, which a previous student group collected during their semester-long project. Using this "colloquial" survey, the students in this study group had lots of fun collecting and analyzing their "own" data, showing that learning statistics can (and should) be fun. We hope that the readers and users of this book experience the same joy in their first encounter with quantitative methods.

The Nuts and Bolts of Empirical Social Science

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2.1 What is Empirical Research in the Social Sciences?

Regardless of its subdiscipline, empirical research in the social sciences tries to decipher how the world works around us. Be it development studies, economics, sociology, political science, or geography, just to name a few disciplines, researchers try to explain how some part of the world is structured. For example, political scientists may try to answer why some people vote while others abstain from casting a ballot. Scholars in developmental studies might look at the influence of foreign aid on economic growth in the receiving country. Researchers in the field of education studies might examine how the size of a school class impacts the learning outcomes of high school students, and economists might be interested in the effect of raising the minimum wage on job growth. Regardless of the discipline they are in, social science researchers try to explain the behavior of individuals such as voters, protesters, students, the behavior of groups such as political parties, companies, or social movement organizations, or the behavior of macro-level units such as countries.

While the tools taught in this book are applicable to all social science disciplines, we mainly cover examples from empirical political science, because this is the discipline in which we teach and research. In all social sciences and in political science, more generally, knowledge acquisition can be both normative and empirical. Normative political science asks the question of how the world ought to be. For example, normative democratic theorists quibble with the question of what a democracy should be. Is it an entity that allows free, fair, and regular elections, which in the democratic literature, is referred to as the "minimum definition of democracy"? (Boogards, 2007). Or must a country, in addition to having a fair electoral process, grant a variety of political rights (e.g., freedom of religion, the freedom of assembly), social rights (e.g., the right to health care and housing), and economic rights (e.g., the right to education or housing) to be "truly" democratic? This more encompassing definition is currently referred

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to in the literature as the "maximum definition of democracy" (Beetham, 1999). While normative and empirically oriented research have fundamentally different goals, they are nevertheless complementary. To highlight, an empirical democracy researcher must have a benchmark when she defines and codes a country as a democracy or non-democracy. This benchmark can only be established through normative means. Normative political science must establish the "gold-standard" against which empirically oriented political scientists can test whether a country is a democracy or not.

As such, empirical political science is less interested in what a democracy should be, but rather how a democracy behaves in the real world. For instance, an empirical researcher could ask the following questions: Do democracies have greater gender representation in parliaments than non-democracies? Do democracies have less military spending than autocracies or hybrid regimes? Is the history curriculum in high schools different in democracies than in other regimes? Does a democracy spend more on social services than an autocracy? Answering these questions requires observation and empirical data. Whether it is collected at the individual level through interviews or surveys, at the meso-level through, for example, membership data of parties or social movements, or at the macro-level through government/international agencies or statistical offices, the collected data should be of high quality. Ideally, the measurement and data collection process of any study should be clearly laid down by the researcher, so that others can replicate the same study. After all, it is our goal to gain intersubjective knowledge. Intersubjective means that if two individuals would engage in the same data collection process and would conduct the same empirical study, their results would be analogous. To be as intersubjective or "facts based" as possible empirical political science should abide by the following criteria:

Falsifiability: the falsifiability paradigm implies that statements or hypotheses can be proven or refuted. For example, the statement that democracies do not go to war with each other can be tested empirically. After defining what a war and democracy is, we can get data that fits our definition for a country's regime type from a trusted source like the *Polity IV* data verse and data for conflict/war from another high-quality source such as the *UCDP/PRIO Armed Conflict* dataset. In second step, we can then use statistics to test whether the statement that democracies refrain from engaging in warfare with each other is true or not.[1,2]

Transmissibility: the process through which we can achieve the transmissibility of research findings is called replication. Replication refers to the process by which prior findings can be retested. Retesting can involve either the same data or new

[1] The PolityIV database adheres to rather minimal definition of democracy. In essence, the database gauges the fairness, competitiveness of the elections and the electoral process on a scale from −10 to +10. −10 describes the "worst" autocracy, while 10 describes a country full respects free, fair, and competitive elections.

[2] The UCDP/ PRIO Armed Conflict Dataset defines minor wars by a death toll between 25 and 1000 people and major wars by a death toll of 1000 people and above (see Gleditsch, 2002).