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Moreno Mancosu

# **Contexts, networks, and the vote**

An analysis of environmental effects  
on electoral behavior in Italy





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*For Giulia, Barbara, and Mauro*



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# Introduction<sup>1</sup>

This book aims at analyzing theoretically and empirically the social and political environments and their relationship with individual voting behavior in Italy. The basic idea behind the theory that will be exposed throughout the work can be summarized as follows: people, in their everyday lives, are assumed to interact and discuss a number of topics; these discussions are expected to construct, crystallize or even change one's beliefs and attitudes on a myriad of topics. By means of interactions and opinions exchange, one can be affected concerning her everyday life decisions, such as buying a new car, trying a different restaurant, finding a job, getting involved in criminal activities or changing opinions about political, or social matters. In these cases, it is usually stated that the individual has been affected by her context or environment. No strong assumptions are needed in order to accept these straightforward statements, and a large number of works have investigated cases in which the environment, broadly defined, affects individuals, and especially their political and electoral behaviors and attitudes (Berelson Lazarsfeld McPhee 1954, Agnew 1987, Agnew 1995, Agnew 1996, Marsh 2002). A significant amount of contributions, especially in US-based research, is focused on this topic and committed to seeking for evidence that connects the context, broadly defined, and voting be-

<sup>1</sup> No work stands on its own. I would like to particularly thank Cristiano Vezzoni, Hans Schadee, Delia Baldassarri, and Michael Shin for reading previous versions of this book. Their suggestions, comments, and observations have contributed crucially to greatly improve the quality of the work.

havior. Especially among European scholars of electoral behavior, however, the term “context” is usually considered as a vague, underdeveloped concept (Makse et al. 2014): tentatively, context is usually considered as the set of factors that do not depend – entirely – on individuals, but contribute to affect the behavior of these latter.

A theoretical attempt of deepening the “context” term is that of Marsh (2002): according to Marsh’s argument, it is possible to identify two types of context: the first, the global one, is connected with the characteristics that can be defined as “high-level factors” – institutions, party systems, electoral laws, macro-historical or macro-social factors. The second, the compositional context, is produced by the composition of the local “units” and is aimed at identifying how variations among these units will affect the behavior of individuals. Marsh argues that the focus on the latter type of effects has led to substantially poor results. Citing earlier works (Huckfeldt Sprague 1995, Pattie Johnston 1995, McAllister Studlar 1992), Marsh states, on the one hand, that geographical variation of the electoral strength of parties, once considered as a “genuine” compositional effect, explains only a residual amount of variance of electoral outcomes. Also personal relationships, according to Marsh, exert an effect, all things considered, weak. The suggestion of Marsh is, therefore, of abandoning studies that deal with compositional effects and focusing more on global contexts, which allow appreciating quantitatively larger effects. The conclusion of Marsh is enlightening of a specific way of understanding electoral studies. The theoretical and epistemological approach which permeates this argument – and a large part of European electoral studies in general – start from the assumption that, from the theoretical and empirical point of view, political macro-environment has some kind of theoretical and technical precedence with respect to voter’s social environments. In other words, the outcome of the elections must be investigated, together with individual properties, using predictors substantially related to “high level” political factors that are placed “beyond” the individual, with respect to relational factors, which are often difficult to empirically measure, and theoretically under-

stand. To some extent, the scientific project pursued by Marsh – and, with him, by a large part of the scholars who study elections – can be linked to the so-called new institutionalism (Hall Taylor 1996), a form theoretical approach to political and social facts that identifies institutions (intended here in a very broad sense) as the main circumstances that affect political behaviors. The new institutional argument made by Marsh is perfectly consistent with a political science-based idea of electoral studies, in which, rather than focusing on interactions, relations, networks and other sociological concepts, the researcher decides to focus on other factors, that actually contribute to shaping vote choices, and, at the same time, are related to genuine political constructs (such as electoral laws and variation in party supply). These theoretical constructs are primarily national, and it seems quite apparent that a vast majority of voting behavior students are concerned in developing, theoretically and technically, relationships between the vote and national predictors.

The empirical and theoretical way that we will follow is radically different with respect the one exposed above: by and large, what we are going to employ in this work is what can be defined as a “sociological” way of investigating electoral behavior. We will argue, by providing empirical evidence of it, that interpersonal interactions that happen during one’s everyday life are relevant in shaping people ideas and behaviors. Citizens, by means of dyadic interactions, can be convinced to change their opinion slightly, or to sustain their idea more strongly, or, even, to be converted by (or convert) their discussant to different opinions. This does not mean that people are not affected by national-level or purely political factors. More simply, what we argue is that, together with high-level political determinants to vote choices, a less studied set of factors, strictly connected to people’s everyday lives, is relevant, if not crucial, in shaping citizenry political attitudes and behaviors. This framework, thus, represents an alternative point of view by which we can see the same processes, such as an electoral campaign or results of an election. Theoretical and technical basis of this “sociological way” of looking at elections and political

behavior can be found in the 1940s and 1950s, in particular with the work of Paul Lazarsfeld and Bernard Berelson (Lazarsfeld Berelson Gaudet 1944, Berelson Lazarsfeld McPhee 1954) who started from a clear and, at that time, innovative epistemological assumptions. According to these theorists, it is possible to understand social reality by means of individual and, especially, relational mechanisms that guide human behavior in modern societies (Machamer Darden Craver 2000). Organizations, informal groups, social networks, structures of interdependence, and actors are equally important to build those theoretical models (Manzo 2010). This scientific program (that has been defined with the term “analytical sociology”) is based on the idea of the individual as a non-atomized object of research (Coleman 1990, Udehn 2001, Manzo 2010). Differently from the classical structuralist sociology (e.g., Blau Schwartz 1984), this approach puts at the center of its theoretical treatment the individual, her desires, beliefs, and opportunities. At the same time, the structural conditions are not left apart but are expected to exert an effect on citizens’ behaviors. Keeping the individual at the center of our theoretical framework, without forgetting her relational environment, means dealing with a person who is affected by several types of effects, coming from outside her.

More precisely, the effects that will be taken into consideration are mainly of two types: the first type is the one that will be defined as a network effect. People with whom individuals share their everyday lives are a fundamental tool through which social – and voting – behavior is modeled. Following the ideas of several important scholars in the field (Granovetter 1973, 1983, Huckfeldt et al. 1995), we will expect that exposure to dissonant views can sometimes convince people to change their political ideas. Also, we will argue that intimacy is a crucial element in evaluating the strength of interpersonal effects: stronger ties – i.e., people who are closest to us – will exert a greater effect on individual characteristics, while people who are less intimate will have a weaker effect.

The second effect identified is that of geographic and temporal context. The context, as it will be stressed during

the book, can be represented as an element that contributes to shaping the opportunities that one has in encountering people that present specific characteristics (Boyd Iversen 1979, Blau 1977). It will be argued that the geographical and temporal contexts contribute to the composition of the network in which the individual is embedded. Another key argument of the work is connected to the relationship between context and network and how the effect of this latter changes according to the strength of the ties that bind individual to different groups (such as relatives, friends, and coworkers, or even strangers). The main feature of this environmental relation is that exposure to relational groups leads to different perceptions and connections with the broader context. This feature, as it will be seen throughout the work, has a significant impact on how individuals perceive the context and on how they can be indirectly connected to this latter.

The theoretical framework, taken by and large, might lead to an important number of expectations. Part of these expectations will be tested using Italian data, and, in particular, by the data collected during (and after) election campaigns of 2013 National Elections and 2014 European Elections. Italy represents a compelling case for many reasons: first of all, the Italian political spectrum has been subjected, in the last few years, to a violent turmoil that threw into crisis the democratic changeover between center-left and center-right coalitions (the political equilibrium that journalists and scholars defined the “Second Republic”). The political crisis represents an important test bench of how the hypothesized mechanisms are actually applicable also to political systems that are less stable with respect to, for instance, US (in which the contextual literature is widespread).

Given that a large part of studies about the relationship between environment and individual voting behavior is performed with US data – one of the most stable two-party system of contemporary democracies – the aim of testing those relations in a multiparty system will need several methodological adjustments. In this work, it will be made use of the stacking technique (van der Eijk et al. 2006), a modified version of usual re-

gression models, which allows the researcher to find relationships between individual choices and characteristics of “generic parties” (De Sio Franklin 2011), considering, in this way, the characteristics of the environments and the effects that these latter can produce on the individual, taking into account, at the same time, several party choices.

Regression-based approaches, however, tell us only indirectly whether mechanisms that we have hypothesized actually hold. To have stronger evidence of theorized mechanisms, simulation approaches will be employed. Simulations, generally speaking, allow us to construct, by means of a computer software, a reproduced social system, in which agents follow elementary behavioral rules and are allowed to interact among each other (Rolfe in Manzo 2014). One of the central concepts of this kind of approach is that of *emergence*: given a number of behavioral and relational rules that agents possess, and given the environment in which these “simulated people” are embedded, emergence is represented by the aggregate patterns and outcomes that emerge from the repeated interactions among agents and between agents and the environment. This approach is usually employed to test the logical consistency of different mechanisms and their aggregate outcome. In this work, an agent-based model will be employed in order to assess the relational/individual mechanisms that relate time, networks and individual voting strategies during an electoral campaign. The agent-based model that will be implemented in the work, moreover, presents another element of novelty: if in political science studies simulations are usually employed to theoretically assess the logical consistency of specific outcomes, neglecting real-world cases, the model presented in these pages has the aim of making the simulation consistent with a real case (the diffusion of Movimento 5 Stelle among Italian electoral body in 2013) and will be primarily based on real data. In this case, thus, the agent-based model will need to be externally valid (Liu 2011).

The book is structured as follows. Chapter 1 will be dedicated to deepening the theory of the environmental effects that has

been only sketched here. It will be investigated the relationship between contexts, networks and the individual, it will be shown how global effects, according to Marsh lexicon, can be consistent with the theory (introducing the concept of constraints set) and it will be argued how the individual has some power in responding actively to these environmental effects. The number of expectations to which the theory leads is quite significant, and only a subset of those expectations will be tested. In particular, it seems interesting to test what we can call the three central tenets of the theory: the interpersonal influence effect, the relationship between geography and networks, and the one between time and networks.

Chapter 2 will focus on individual strategies by which citizens can react to relational stimuli. In particular, the chapter is focused on testing interpersonal influence, namely, the relational pattern that, given a situation of disagreement, results in some sort of agreement reached by people changing actively their political position.

Chapter 3 will focus on the relationship between geographical space and interpersonal networks in Italian National Elections of 2013, showing how people can be affected by both these levels of the sub-national environment. Moreover, it will be argued, using multilevel regression models, how these two levels interact.

In chapter 4, the relation between time and network will be investigated. The chapter will focus on the case of Movimento 5 Stelle increase during the 2013 election campaign. Simulation-based evidence will be exposed to stress that the shaping capacities that the context has on networks can form a diffusion of an innovation-like process. Moreover, it will be stressed (as in chapter 3) how different levels of intimacy among people lead to different outcomes.

Finally, the final chapter will summarize the results obtained in the previous four chapters, investigate the implications of these findings, and advice further testing of this theoretical framework.



## Environmental effects and electoral behavior

An explanatory model

### 1.1. Introduction

An attempt at producing a taxonomy of the environmental effects theories could start from many authors and traditions. Usually, conventional interpretations of studies focusing on electoral behaviors' social determinants identify Columbia school and its leading representatives – Berelson, Lazarsfeld, McPhee, and Gaudet – as the founders of this research program, which produced a robust foundation for theoretical and empirical analyses of the social and contextual determinants of the vote. Columbia scholars remain those who focused primarily on identifying a socially-mediated calculus as a driving mechanism of voting behavior. According to them, electoral behavior is highly dependent on the social and geographical environment in which voters are embedded. In their studies, huge stress is given to the role of “molecular interactions,” as well as “hot communication” inside groups (Baker Ames Renno 2006). In general, we can state that according to Columbia theorists the environment surrounding the individuals can act as a tool of electoral choice crystallization or change. In this work, however, we aim at tackling theoretically, rather than historically, the issue. In doing so, it seems appropriate to start with the theoretical framework of Eulau (1986) who defines the effect of the context as a subset of what he calls “environmental effects.” An environmental effect, according to Eulau, is anything that af-

fects<sup>1</sup> “from the outside” an individual behavior. In Eulau conceptual scheme, proper “contextual” effects are represented only by those processes that affect the individual by means of interactions with other individuals (Eulau 1986, Huckfeldt 1986). Although this definition of context will not be employed in our work, at least in its nomenclature, it remains crucial for our aims as it introduces a non-trivial difference in environmental effects: the environment can affect individual both in a general fashion and specifically by means of interactions, that is, by means of processes of communication among people (Huckfeldt 1986, Huckfeldt Sprague 1995). Eulau’s argument largely coincides with the Columbia school’s framework (Berelson Lazarsfeld McPhee 1954, Zuckerman 2005): a key feature of the Columbia approach and of those who explicitly refers to these studies is to consider the interactions – usually in co-presence – among two or more people as a fundamental element that can alter people’s change or stability of opinions.

The interactional environment, however, is not the only external source of pressure which is worth to be investigated. Other elements, which are not directly related to interactions among citizens, must be stressed. First, people do not interact in a spatiotemporal vacuum. Instead, they do it in a precise set of spatial and temporal constraints: people live in a house, located in a neighborhood, which in turn, is located in a municipality, and so on. Moreover, people are embedded in a temporal frame, which can be defined in terms of long (ages) or short periods (days of an election campaign). These spatiotemporal constraints contribute to affect electoral behavior (McClurg 2006, Mancosu 2016). In general, according to Blau and Huckfeldt

<sup>1</sup> Throughout the work, there will be used two ways of defining the way in which characteristics of other people, by means of interactions, can change characteristics of our reference individual: the first is the term “influence”, which means a precise phenomenon according to which ego is affected by alter and is convinced to change completely, or in part, her beliefs and actions. Other terms, more generic (such as “affect” or “pressure”) will be used to name all other kind of pressure that can be derived by a large number of mechanisms, such as contextual effects or homophily processes.

(Blau 1977, Huckfeldt 1986, Huckfeldt Sprague 1995), we can state that the spatial and temporal constraints are theoretically antecedent to the relational processes that characterize citizens' everyday lives. By definition, co-presence interactions among individuals contribute to change citizens' systems of beliefs, commitments, and values; what we assume when we posit the effect of social relations on human behavior is that – reasoning counter-factually – a person's properties in a relational pattern A could be different from those of the same individual in a relational situation B. Having stated that, let us imagine an individual who has a probability to be affected in one of its characteristics (a political attitude, or a behavior) by other individuals. The probability of being influenced by another individual will depend on a number of factors (mainly due to the characteristics of the individuals involved in the relationships, such as their ability to convince ego, the knowledge of both the discussants, the exogenous strength of their opinions, the original distance in political attitudes of the discussants etc.). The primary logical assumption that leads us to detect the role of spatiotemporal context is that all these relational characteristics realistically follow the exposure of our ego to other individuals. In other words, if ego is not exposed to another individual, that means that she has no relation with that individual, which, in turn, leads to the conclusion that there is no pressure on that individual whatsoever.

Now, it is possible to insert in this mind experiment the context: imagine, thus, that the relation takes place in a specific place A, in which, as a characteristic relevant to us, people are distributed in an  $a$  manner. The probability of exposure to an  $A$  supporter will be function of the distribution  $a$  of individuals in place A. The same individual, in the place B (which has a  $b$  distribution of individuals) will have a different likelihood of being affected. It is possible to apply the same argument with time, instead of space. A person in time  $t_0$ , which can be a particular day, a month, or year, can be pushed by different social forces (personified by citizens with whom she communicates) with respect to the same person in time  $t_1$ . In this way, time

acts, like space, in producing different opportunities of contact between people. Having sketched the central argument of the work – that is, temporal and spatial framework contribute to shaping the opportunities to relate with other people, influencing, in turn, the likelihood to be affected in a specific characteristic – it seems appropriate to insert our argument in a clear and consistent defining scheme. Consistent with the definitions of Huckfeldt and Sprague (1995), we can now define principal terms that will be employed throughout the work. Given a reference individual (namely, the target of different environmental pressures):

- a) we define context as the uneven distribution in space and time of individuals holding specific characteristics;
- b) we define the network as the sum of interpersonal relations the reference individual maintains with other people;
- c) we define network effects as the processes of pressure in which other people contribute to change or reinforce reference individual's characteristics, by means of interpersonal relations.

The composition of people in a specific time or space (the context) contributes, thus, to shape the set of relations that a person can have (the network): to paraphrase Blau, an individual cannot interact with an Eskimo, if there are no Eskimos around. According to the theoretical strategy adopted in this work, thus, the context does not contribute directly to affect the individual<sup>2</sup> but contributes to defining the set of relations that the individual may have. Given a certain social context of opportunities, only the relationships that take place in this context are those that actually affect the individual. In general, there-

<sup>2</sup> Actually, it can be theorized that the geographical context can influence the way in which people perceive the general climate surrounding them, and could thus contribute to influence them in a direct way. We will deepen this topic in chapter 3.

fore, we can say that contexts and networks can be hierarchized in a chain that includes the former as a necessary condition of the latter. This is consistent with many works (in particular, the hierarchical structure of these environments is presented in Huckfeldt Sprague 1987, Huckfeldt Sprague 1995, Agnew 1995), in which higher levels “contain” lower ones.

So far, the relation between what has been called the context (or, even better, contexts) and the network has been briefly outlined. Another environmental source of effects should, however, be kept into consideration. Different global environmental effects strongly affect electoral behavior. Electoral laws, party systems, and type of elections represent elements that can influence the relationships between context, network, and individual behavior. In this book, these institutional elements are defined as *constraints sets*. It has been decided to define them as “constraints” because they are elements on which individuals cannot exert a direct influence. Voters, in addition to being affected by their network, contribute themselves to be part of the network (and, to a lesser extent, the context) for someone else. In the case of the constraint sets, on the contrary, the electoral body is assumed to have no role in the definition of the rules of the game. Constraints sets have not a direct theoretical precedence with respect to contexts and networks. Simply, they affect individuals, as well as network and contextual environments at the same time. They represent a sort of macro-environment in which basic laws remain more or less unchanged in an adequate amount of space and time (for instance, the time of an election campaign and its aftermath).

## **1.2. Patterns of network pressure and the influence mechanism**

The model depicted so far is characterized by two fundamental assumptions, theoretically preceding the model itself: the first assumption – or theoretical prerequisite – is the centrality of the individual in the model. The individual – or reference individu-

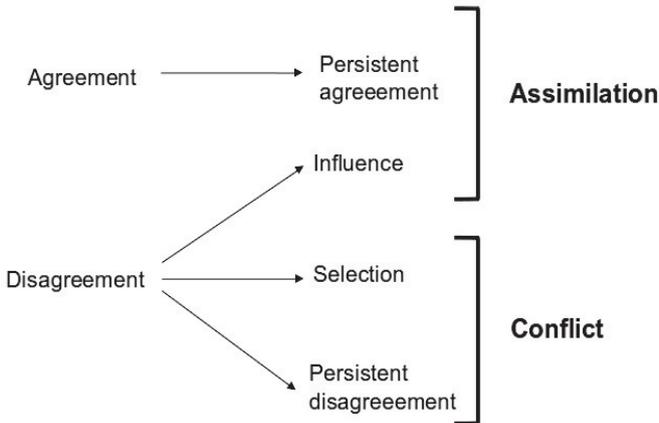
al, a simplification that allows constructing the argument theoretically – is subjected to different, direct and indirect, effects. These effects are mainly exerted by other individuals, especially when we talk about network effects. However, we cannot forget that our reference individual is him/herself source of environmental effect for people with she is in contact.

The second assumption that must be considered in the model is characterized by the passive role of the individual: this latter represents a sort of passive recipient of environmental effects, and, at this point of the theoretical presentation of the model, seems to have no power in selecting or resist to the environmental forces. In other words, the theory exposed so far is more focused on environmental forces and neglects, to some extent, the concept of individual action. This paragraph is aimed at deepening how individuals can respond to environmental stimuli. The point of view that we will choose is not related to individual characteristics that can allow or deny environmental effects: in this respect, many studies have previously contributed to collect theoretical arguments and empirical evidence. It has been demonstrated, for instance, how political sophistication can be a strong determinant of levels of permeability with respect to discussants opinions (Zaller 1992, De Sio 2008, Huckfeldt 2001).

Keeping constant those factors, other types of responses to environmental stimuli can be argued. These responses, which are not directly connected with individual characteristics, will be called relational responses. Huckfeldt argues that individuals can react to the social forces that swing them toward a political option in two ways: individuals can present assimilation- or conflict-driven responses (Huckfeldt 1986). An example of assimilation can be represented by Newcomb's seminal work (Newcomb 1957), in which it is shown that young women in Bennington College (a private college in Vermont) were persuaded to embrace liberal ideas by the school environment. Most students who, at the beginning of their experience in Barrington College, were reflecting the (mainly conservative) political opinions of their par-

ents, gradually changed their view, affected by a significant share of their peer group.

In his classic study, Key (1949), showed an opposite effect of the environment in shaping political opinion in opposition to external stimuli. According to the study, in the south of the US, a more extensive prevalence of Afro-American population has, as a result, a stronger effect on white citizens to have more conservative opinions and xenophobic sentiments toward the out-group. These two studies show how a strict entanglement of individual, social and environmental characteristics can lead to opposite outcomes. These cases exemplify the two concepts that will be developed in these pages. As Huckfeldt points out (1986) «Assimilation is consensual, favorable response to a social context that can be empirically identified as an instance in which the individual probability of engaging in a behavior sympathetic toward a group, or predominant within a group, increases as a function of that group's concentration, or density, within the population». On the other side, «[c]onflict is a dissonant reaction to context that can be identified empirically as an instance in which the individual probability of engaging in a behavior sympathetic toward a group, or predominant within a



**Figure 1.1.** Assimilation and conflict as individual responses to discussants.

group, decreases as a function of that group's density in the population» (Huckfeldt 1986). Being focused on individual responses, Huckfeldt's theory provides a comprehensive definition of context (both network-based and contextual). However, it is clear that reactions of assimilation and conflict happen mainly at the relational level: as we stressed above, the relational level is the principal element that can affect individuals' behaviors and opinions. Consequently, is at this level that responses to the environment can be evaluated. We can also say that assimilation and conflict are, in its more refined way, dyadic processes, that is, processes that involve the reference individual and one of her discussants. The fact that, as Huckfeldt specifies, we can interpret these concepts as a relation between individual and social groups does not cancel the fact that the group is composed of discussants, that every discussant holds a political opinion, and, in turn, that every political opinion can be consensual or dissonant with respect to our reference individual. Individual reactions, in practice, can be seen mainly in a dyadic framework. The logical consequence of treating the dyad as the fundamental environment in which people can react is, thus, to use the term political agreement and disagreement (Huckfeldt Johnson Sprague 2004) to translate assimilation and conflict, from a generic "context" framework to a relational one.

In figure 1.1 is exposed a simple model of how the dynamic of assimilation and conflict works. In a dyadic relationship, an individual can simply agree with her discussant, remaining in agreement at a later moment. In this case, we can talk about persistent agreement. In general, indeed, dyadic relationships tend to be non-conflictual. The idea of persistent agreement is based on the fact that people in interaction, in the majority of the cases, are agreement-seekers (Huckfeldt Johnson Sprague 2004). People in interaction with others are more prone to share ideas with agreeable discussants instead of engaging in discussions which lead to a stressful condition. According to Festinger (1957, Heider 1958), processes of cognitive dissonance reduction are enacted by individuals to avoid disagreement with

other citizens. Given the hurdles that impede the production of disagreeable relationships, usually, agreement is the “normal” situation among citizens.

As Huckfeldt and colleagues (2004) point out, however, agreement is not the only situation in which people can find themselves. For instance, it has been demonstrated that, in some cases, discussants can present situations of persistent disagreement, that is, circumstances in which, contrarily to the expectation of cognitive dissonance theories, people are stably engaged in dissonant relationships. Huckfeldt and colleagues have identified broader context characteristics as essential determinants of this type of behavior. In general, authors stressed the fact that a certain degree of persistent disagreement in a dyad is sustainable when the residual network (that is, the other dyads in that are present in the ego network) is coherent with ego.

Persistent agreement and disagreement are mainly stable processes. In the literature, two other dyadic outcomes have been deepened so far. They both consider the idea that, given a situation of disagreement, ego and alter, instead of taking the way of persistent disagreement, can differentiate their action. Given a situation of disagreement, thus, an individual can react in two ways: as shown in figure 1.1, the individual can influence (/being influenced) or select her discussant. Influence is the process according to which a sort of agreement between discussants is reached. Ego can influence her alter or, conversely, she can be converted to another political option (Bello Rolfe 2014). A person who finds herself in a disagreeable relationship with her discussant, instead, can just filter out her disagreeable discussants, that is, stop talking about politics with that person and withdraw from the conversation (Mutz 2002, Noel Nyhan 2011, Bello Rolfe 2014). According to the classification that we have provided so far, it is possible to define these two dynamic processes as assimilation and conflict responses. As pointed out in figure 1.1, influence can be defined as an example of assimilation processes: coming to an agreement from a previous situation of disagreement means that people, to some extent, have given consonant responses to the environment. On the contrary,

avoiding further relations with the dissonant discussant can be defined as a conflictual behavior. As far as selection is concerned, several attempts have been made to test the actual relevance of the mechanism in the electorate in different contexts (Noel Nyhan 2011, Bello Rolfe, 2014). However, it seems that, overall, selection is a rarely employed strategy in European democracies (previous works have also tested for the relevance of selection effect in Italy, which produced inconsistent evidence, see Mancosu Vezzoni 2017). As a result, in later chapters, we will focus in particular on influence mechanisms, which received much more attention (Bello Rolfe, 2014; Schmitt-Beck Partheymüller, 2016; Mancosu Vezzoni 2017) and proved to be a relational pattern that crucially contributes to determining electoral volatility.

### **1.3. Groups, network, contexts, and their relationship**

The network, as stressed above, is a source of environmental pressure that affects individuals, mainly by means of influence mechanisms: it can be represented by the sum of all interactions in which an individual is engaged. The nature of the discussants with which people interact, however, can vary. An individual is in relation with different types of people, who share with him different dimensions of her daily life. From a theoretical point of view, several taxonomies can be employed in order to differentiate a person's discussants: in this work, it will be stressed a characteristic that is fundamental in distinguishing an individual's set of relations, that is, their strength. According to Granovetter (1973), the strength of a tie «is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie» (Granovetter 1973). The assumption on which this idea is based is quite straightforward: discussing with a relative or with a partner is, usually, different, from many points of view, compared to interacting with co-workers or random people who one can meet in line at the post office.

Starting from this theoretical argument, previous works showed how, in a chaotic set of relationships in which one is engaged, it is possible to extract (almost) systematic differences and, by means of the concept of tie strength, to construct taxonomies that take into account social groups (or circles) instead of simple dyads (see Huckfeldt et al. 1995, Erisen Erisen 2012).

The first and most important group is usually defined as primary group (Huckfeldt 1986) or *cohesive social group* (Huckfeldt et al. 1995). Primary groups are defined as those social groups with which people have strong, durable and stable relationships. An example can be provided by the family. Huckfeldt and colleagues (Huckfeldt et al. 1995, but see also Dinas 2013) have repeatedly emphasized that the pressure of primary groups is crucial, not only for the political socialization of young people but also for adults.

In the literature, there is the relatively consolidated idea that cohesive social groups are characterized by strong ties presence. Exposure and interactions with a cohesive social groups lead to consequences that invest the relations between the individual and the context as we defined it above (that is, the spatial and temporal framework in which individuals are embedded). These consequences are strictly related to the characteristic of the interactions enacted inside the group.

First of all, people exposed to cohesive social groups tend to be more coerced in their attitudes and behaviors with respect to other groups. As pointed out by Huckfeldt and Sprague (1995), discussing, interacting, arguing with people of our network leads us to be exposed to different arguments coming from different sources, with which we share different degrees of intimacy, time spent together, emotional and material exchanges. We can thus legitimately argue that the more the sources of information (that is, the people) with which we interact are intimate with us, the more their opinion will be taken into consideration, and the more *coercive power* of such sources will be strong. This expectation was demonstrated by several works (Huckfeldt Sprague 1995, Mutz 2002, Huckfeldt Johnson Sprague 2004, Huckfeldt Mendez Osborn 2004, Mancosu Vezzoni 2017b)

which showed that strong relationships tend to present higher levels of opinions' homogeneity.

Another consequence of groups' cohesiveness concerns the relationship that cohesive social groups and context present. We have stated that context contributes to shape opportunities that an individual has in encountering discussants holding certain characteristics. That means that network's characteristics are function of the context in which the network is located (Putnam 1966). Given these premises, we can expect that cohesive social groups are less subject to the *shaping power* of the context compared to less cohesive groups. This argument can be defended counterfactually. Imagine a case in which the shaping power of the context affects entirely cohesive social groups in a specific set of choices: that would mean that the distribution of these choices would be identical in the broader (spatiotemporal) context and the cohesive social group, but this is empirically not true if we assume that cohesive groups are (sometimes significantly) more homogeneous with respect to less cohesive groups and the context in which they are embedded (see Newbeerta Flap 2000, Mancosu 2016): thus, it is possible to state that homogeneity of the primary groups leads to a weaker effect of the context in shaping cohesive networks.

The third and last consequence of being exposed to a cohesive social group is the different degree of *sensitivity* to the broader context. Cohesiveness, by definition, leads to close, homogeneous groups, in which everyone knows each other. In this kind of situation, Huckfeldt and colleagues argue, the ways by which political information can travel are quite limited (Huckfeldt et al 1995, Vezzoni Mancosu 2016). As a result, it is difficult for an individual embedded in such a group to be exposed to the opinions of the broader context. The exposure of these people to the public climate of opinion is weaker, and, in general, is altered by the cohesive social group, which represents some sort of "funhouse mirror" that distorts political messages coming from the broader context or even makes it impossible for individuals to be reached by those messages.

It has repeatedly been demonstrated that political information and pressure, besides family, are transmitted through mechanisms of social loyalty by specific social groups (Tingsten 1937, Huckfeldt 1984, Huckfeldt 1986). We will define groups that affect individuals in this way as *non-cohesive social groups*. Studies on “environmental influence” of Langton and Rapoport (e.g., 1975), which closely relate to our definition of non-cohesive group, stress the importance of social loyalties in social relations: in addition to the effect of the primary groups, people often share with their environment a number of features not purely political (ethnic, religious, class-related, etc.): a person embedded in groups composed of workmates, friends, sport fellows, etc. can share a part of his everyday life with people belonging to social groups different from the family (Tingsten 1937, Kelley 1952) and be affected by them.

From a social network point of view, non-cohesive social groups are characterized by social ties that are weaker compared to the family (Huckfeldt et al. 1995). Following what we have stated concerning cohesive social groups, also non-cohesive groups are characterized by three additional properties, produced by the degree of cohesiveness of the groups: for what concerns *coercion*, we can expect lower levels of coercive power enacted by the non-cohesive groups. Given that these groups are composed of weaker ties compared to the familiar one, the expectation is that the *shaping power* of the context toward these latter groups will be higher. In other words, the weakness of the ties leads to less homogeneous groups, and this leads to a higher correspondence between these groups and the context. This, of course, does not mean that non-cohesive social groups can be intended as a representative subsample of the spatial or temporal context. For instance, different workplaces – according to the nature of one’s job – lead to different distributions of political opinions and behavior (*ceteris paribus*, the distribution of political opinions in a factory will be very different compared to the newsroom of a newspaper or a political science department). More simply, we expect that groups characterized by weaker ties are less different from the context compared to

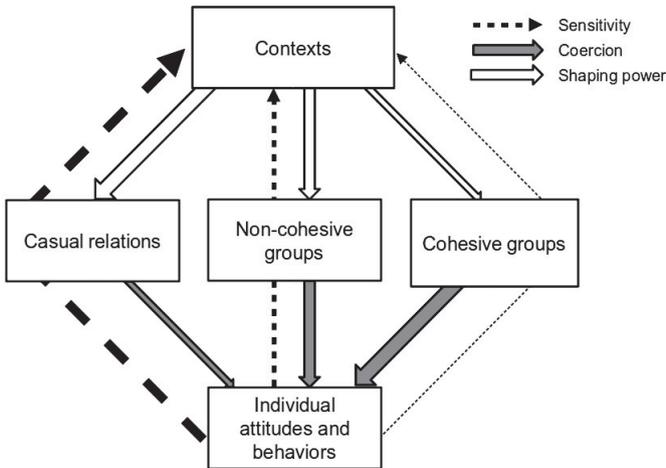
the family, and this has consequences on the heterogeneity of the group itself – that is expected to be higher. Third, the weak ties structure – that, usually, non-cohesive social groups present – allows individuals to be more fully aware of the public opinion. Huckfeldt and colleagues explain in this way how structural characteristics of different social networks influence the exposure to political information: «[i]nformation that is communicated through weak ties typically travels farther because it is less likely to feed back to the point of origin [...] When social communication occurs through weak ties, beyond the boundaries of cohesive social groups, public opinion becomes more fully public» (Huckfeldt et al. 1995). The main consequence that one can imagine about this process of “differentiated awareness” is that people who are embedded in non-cohesive social groups are more *sensitive* to the broader opinion climate.

It is important to stress the relationship that exists between the cohesiveness of a social group and presence of strong ties inside it. Huckfeldt and colleagues (Huckfeldt et al. 1995) connect the concept of cohesive/non-cohesive social group to the strong/weak ties framework, defining the family and the partner/spouse as a cohesive social group. At the same time, those relations which are outside these boundaries (such as friends or workmates) are defined as non-cohesive groups. Bello and Rolfe (2014), as well as Erisen and Erisen (2012), treat the two concepts interchangeably (better, these works assume that cohesive social groups are primarily composed of strong ties and vice versa) without deepening too much the theoretical reasons of their choice. Although many scholars have treated the two constructs as equivalent, a theoretical difference actually exists. The main difference between the concepts of strong/weak ties from one side and cohesive/non-cohesive social group from the other is that, if in the first set of concepts, intimacy, intensity and stability of the relation are measured, in the second set of concepts discussants belonging to one social circle with respect to another are assumed to enact relations characterized by weak or strong ties. The research that translated these concepts in electoral studies assumes that cohesive social groups (that is,

family and the partner) are characterized by a consistent presence of “strong ties,” independently from the actual intimacy that these people share. Similarly, non-cohesive social groups, represented by co-workers, friends or neighbors, are assumed to represent, for our reference individual, a set of weak ties. This assumption (that represent, to some extent, a stretch of Granovetter theory and concepts) can be defensible, more than theoretically, empirically: the main idea behind this choice is that “normal” relations between people and their family will lead to present, by and large, characteristics that Granovetter lists in his seminal article (Huckfeldt et al. 1995) and this is particularly true in Italy (Baldassarri 2009, Mancosu 2016, Mancosu Vez-zoni 2017). For the same reason, friends, co-workers, and neighbors tend to have, by and large, less intimate relations with our ego; this, however, does not mean that, in some cases, a person can evaluate more important political discussions with a co-worker with respect to a wife/husband. More simply, the theoretical expectation that is implied above is that, overall, social groups can be ordered according to different levels of intimacy, from the stronger one (wives, husbands, fathers, mothers, sons) to the less intimate ones (neighbors, co-workers).

The third and last set of relations that will be treated cannot be intended by a group in the proper sense of the term because it represents theoretically the sum of all the residual relations that individuals experience in their everyday lives. This “residual” is constituted by casual interpersonal relations that people have in different and unpredictable ways. «When apolitical men or women shop at the local supermarkets, stand in line at the local post office, sit in line at the local gas station, mow their lawns, walk in their neighborhoods, and engage in other everyday activities, they are also experiencing a form of casual social interaction with politically important consequences. [...] the neighborhood social context might be important even for individuals who never discuss politics with close friends, and even for social isolates who have no friends» (Huckfeldt 1986). Needless to say, casual encounters, by and large, have much lower coercive power compared to both cohesive and non-

cohesive network. People are hardly converted by strangers when they are in line at the post office, except in cases in which, as stressed by Huckfeldt, these individuals are apolitical and lack in other politically relevant interactions. An interesting characteristic of casual social relationships is the connection between these latter and the spatiotemporal context: as we stated before, cohesive social groups (which are personified by families and the partner), are relatively independent with respect to spatial and temporal contexts. According to our theoretical framework, they tend to be refractory to spatial compositions of political preferences and fluctuations of public opinion over time. The dependence from the context by non-cohesive social groups is, rather, assumed to be stronger compared to that of cohesive ones. In a continuum-like fashion, thus, the relation between the casual encounters and the context is stronger. More precisely, the shaping power that the contexts exert on these set of interactions is stronger, even stronger than reference groups'. In other words, having a casual encounter with a person in line at the gas station is (almost) like picking a person from a random sample. We say "almost" because, to some extent, public places that persons usually associate with are not completely



**Figure 1.2.** Theoretical links between contextual levels, social groups and the individual.

“public”, that is, different supermarkets are designed for different groups of customers, local post office can be situated in rich or poor neighborhoods and, thus, mainly frequented by high/low-class citizens and so on. However, although they do not give a perfect image of the so-called “public opinion”, or “general climate” (Huckfeldt et al. 1995), casual encounter are, at the relational level, the primary way in which people can perceive this latter trends, in a spatial and temporal fashion. As a consequence, sensitivity to the broader context is higher with respect to both cohesive and non-cohesive groups when people are exposed to casual encounter<sup>3</sup>.

The picture presented in Figure 1.2 summarizes the relation between contextual levels and different networks graphically; it is mainly based on the outline provided by Huckfeldt (1986) but contains some significant differences. The top of the figure represents the contexts (time and geographical ones) that, as underlined previously, contribute to shaping the opportunities for interactions in co-presence. As pointed out before, and differently from the outline sketched by Huckfeldt, the effect of the contexts on networks (and, in particular, on different social groups) is not exerted in the same way. In other words, the shaping power of the contexts – represented by the thickness of white arrows in the figure – does not affect equally all the social circles. At the same time, the coercive abilities of these circles – that is, the capacity to affect individuals – are differenti-

<sup>3</sup> So far, the theoretical framework assumed indirectly that all the individuals in the network are all at the same level. That is actually not true. As pointed out by classical theory on network influence (Katz Lazarsfeld 1957, Katz 1957), influence in interpersonal communication is mediated by individual characteristics of the nodes, such as the capacity of certain individuals to be acknowledged as “opinion leaders” or, more generally, “experts” of a certain topic.

Experts’ opinions are more likely to be considered by less attentive individuals in their political choices. Even though the political attentiveness is crucial in shaping the relation between individuals and their contexts (Mancosu 2014) and networks (Sidanius Lau 1989, McClurg, 2006, Huckfeldt et al. 2000), the work’s main statement and major aim are to focus on structural/relational characteristics of the environment. The focus on individual characteristics would need a much more refined theory.

ated, as represented in the thickness of grey arrows. Individual sensitivity to the broader context, represented by the thickness of the dashed line, decreases as the cohesiveness of the groups increases.

#### **1.4. Alternative explanations: the role of media effects in election campaigns**

The idea of a time-space-based social science implies a discussion of the effect that time, in addition to space, can exert on the behavior we are going to study. The idea of a geographical effect that affects individual choices is widely recognized to be one of the driving factors that can contribute to change or crystallize people vote choices. In other words, it is quite clear that space contributes to affect citizens' opinions, but what about time? It is possible to list basically three types of studies that are committed to investigating just as many time-span: several studies – especially recent studies (e.g. Dinas 2013, Corbetta Tuorto 2004, Zuckerman Dasovic Fitzgerald 2007) – focus on political changes and invariance in the long run, in order to assess, for instance, intergenerational transmission of political opinion from fathers and mothers to sons and daughters; other studies are focused on medium time-spans: the electoral cycle – or second-order election – theories (Reif Schmitt 1980, van der Eijk Franklin 1996) are committed to investigating differences between national elections and second-order elections (such as regional, European or mid-term elections). Many studies that – borrowing the expression of Michael Marsh (2002) – are committed to explaining elections, instead of electoral behavior, are usually presented as the time-span of a political campaign. How do campaigns affect voters' behavior? The question was crucial in the aforementioned works by the Columbia scholars (Berelson Lazarsfeld McPhee 1956), who, for the first time in electoral studies, conceived new techniques to investigate campaign effects in the US. The idea that election campaigns affect vote choice is strictly connected with what happens during the cam-

paign. In other words, the campaign is not an “empty time” characterized by the simple – reduced – distance from the Election Day. As pointed out in many studies (Harrop 1987, Norris et al. 1999, Swyngedouw et al. 2004) the time of the electoral campaign is a crucial moment in which political opinion and beliefs are tested and, at the same time, conversion and changes of mind are more likely. It has been shown that the election campaign effect on voters’ changes of mind is becoming more and more crucial in recent decades compared to the past: «At the beginning of the 1960s, one in 10 British voters made up his or her mind during the actual campaign; by the 1990s, this number had risen to one in four» (van Aelst et al. 2008). Studies related to the election campaigns, usually, intend their principal research object as a top-down process (Schmitt-Beck and Farrell 2002), in which parties and candidates are focused on convincing the largest number of voters. As pointed out above, however, electoral campaigns can be seen as a sort of grassroots process, in which social and political relations among citizens are the real engine of political change in large part of the population and top-down strategies, although influential, are not at the center of the analysis (Berelson Lazarsfeld McPhee 1954, Huckfeldt Sprague 1995, Bello Rolfe 2014).

From one side, during a campaign, politicians, parties, specialists agencies, militants, «seek to mobilize support among the mass public, to persuade citizens to their cause, and to inform citizenry about public policies and political activities» (Schmitt-Beck Farrell 2002). From the supply side, thus, a campaign aims at informing, mobilizing or even converting to another opinion the largest amount of people possible. The tools that political actors employ in order to convince citizens are different. Schmitt-Beck argues (2003) that two main elements of this top-down process can be listed. The first is related to the media: Harrop (1987), for instance, states that “the media do not cover the campaign, they are the campaign.” Media coverage of a party/candidate idea, as well as image-related characteristics of candidates, have repeatedly demonstrated to exert a positive effect on mobilization and opinion crystallization

(Maddens et al. 2006; Van Aelst et al. 2006). The effect of media can be mainly distinguished in the news, talk shows and advertising (Schmitt-Beck Farrell 2002, Schmitt-Beck 1994): these three tools help parties to convey their ideas to the citizenry. Political actors are committed to having as much control as possible concerning the contents that these three media convey. Parties and candidates, thus, usually employ a significant amount of organizational and economic resources to place themselves in a privileged position in the media landscape (Jacobson 1985, Schmitt-Beck Farrell 2002).

Although media arena is perceived as one of the crucial fields in which the electoral competition is played, many scholars are pretty persuaded that media coverage effects are usually overestimated, theoretically and empirically (Dalton et al. 1998; Mughan 2000; Norris et al. 1999): with this respect, it is possible to give an alternative interpretation of the importance of media system, not necessarily related to its direct effect on voting attitudes and behaviors. In doing so, it becomes interesting stressing the role of grassroots processes. The central idea of this approach is that top-down processes, such as the media system, are just catalysts that serve as an injector of deeper mechanisms taking place among citizens. According to Huckfeldt and Sprague, a political campaign is a period in which the environment is “altered” (Huckfeldt Sprague 1995). Talking about South Bend (a county in Indiana, USA, in which the authors performed their data collection), they stress the idea that several elements can contribute to enhancing the perceptions that the period of election campaign is different from previous and later times: «the South Bend Tribune, bumper stickers, yard signs, party workers, candidate mailings, and informal discussions all served as inescapable reminders for South Bend residents. In short, and as John Stuart Mill has informed us, democratic politics includes a substantial element of coercion: citizens unavoidably pay heed to the events and debates and issues that impinge upon their lives from all sides» (Huckfeldt Sprague 1995). The campaign itself, moreover, is characterized by periods in which the alteration of the environment is not clear to all

citizens and periods in which the campaign “accelerates.” Relevant facts, scandals (Schmitt-Beck Farrell 2002) or the plain and simple approaching to the election day (Huckfeldt Sprague 1995, Baker Ames Renno 2006) lead to make more significant proportions of citizens more acquainted with what is going on in the political landscape and, then, more prone to discuss about politics. The focus of the book, thus, deviates from the mainstream literature on election campaigns, by not focusing on media-related effects and by investigating primarily the interactional/contextual mechanisms that emerge during election campaigns.

### **1.5. Why Italy?**

The theoretical framework exposed above is enough general to be employed in a large number of case studies: many of the individual statements and part of the theoretical structure derive from the American literature, which boasts a long tradition (with respect to European electoral studies) of the investigation of voting behaviors’ social determinants. Nothing forbids us to apply to other countries one or more theoretical expectations that can be extracted from the exposure of the theoretical framework. As pointed out above, works employing European data in combination with theoretical expectation involving social determinants to vote are quite rare in the literature (Schmitt-Beck 2003, Bello Rolfe 2014). In particular, Italy provides some essential characteristics that could be useful to identify strong evidence consistent with our framework. First of all, it is important to stress the particular geographical pattern of the Italian political landscape: as pointed out in many studies (Galli 1968, Sani 1976, Diamanti 1993, Diamanti 2003), one of the Italian distinctive traits is the stability of its so-called “electoral geopolitics”, that is, the geographical subdivision between spheres of influence, dominated by former major parties of the political landscape during the First Republic (1946-1992) and the legacy produced by this political system, which began in

1994 (Diamanti 2003, Vezzoni 2008). The main idea that we can derive from the electoral geopolitics in Italy is that, combined with the long-standing stability, Italy also presents vast sub-national variance of the support for parties (Diamanti 2003), as well as a scattered geography of political support.

The second, and more important, property that Italy provides for the analysis resides in the choice of the elections that will be treated: National Elections of 2013 and European Elections of 2014 provided a number of surprises for journalists, politicians, and electoral behavior scholars: first of all, it must be remembered that 2013 elections in Italy were held in a climate of strong political and economic crisis; moreover, almost half of the electoral body changes its vote from the previous elections (held in 2008): new political parties, presenting a harsh critical attitude toward the traditional political landscape, received strong support, in differentiated parts of the country, by means of a sudden rise a few weeks before the election day (ITANES 2013, Vezzoni Mancosu 2016). In particular, it is important to stress the role of Beppe Grillo's Movimento 5 Stelle, a "strange political creature" (Corbetta Gualmini 2013) that gained, at its first appearance on the national electoral scene, 25% of valid votes, becoming the most supported party on the Italian territory, after an aggressive election campaign. Elections of 2014, from the other side, see a substantial victory of the PD, led by Matteo Renzi, that gains 40.8% of valid votes, an unprecedented result for every party in the Italian political spectrum (Maggini in De Sio Emanuele Maggini 2014). This political turmoil, thus, is useful for our aims because it allows us to assess strong, rapid differences over time (testing in this way the effects that time context exerts on networks and, thus, on individuals) and, at the same time, gives us a combination of traditional and new parties that is difficult to find in contemporary mature democracies. Summarizing, the peculiar case of Italy during the first part of the 2010s is that both geographical and time contexts (namely, the distribution of opinions along space and time) vary to a large extent. We are persuaded that this variation represents an important test bench of the theory. This chapter, so far, has

focused on producing a coherent and comprehensive theoretical framework that accounts for environmental effects. We have separated the concept of environment from that of constraints set, postulating that the work would be focused on environments that pertain to the same constraints set. Primarily, two types of environmental effect have been identified according to this framework: the contextual and the network effect. A relationship between them and a theoretical precedence of the contextual with respect to the network effect have been hypothesized. We have argued that space and time contribute to shaping the relations between networks and the individual. We have also argued that there is no single network, but it is possible to theoretically subdivide the broad concept of network into different social circles or groups, which have the same “qualitative” relations with the higher level context and the individual but are characterized by different degrees of those relationships. We have also tackled the issue concerning the responses that individuals can give to these effects, and we systematized four theoretically significant dyadic dynamics according to which individuals can accept or reject the pressure of their relational environment. The number of hypotheses that we could draw from this theoretical framework is quite large. We have thus selected three sets of topics that can test the main assumptions. These, however, cannot exhaust many other hypotheses that could arise from the theory.

We can state that, generally speaking, the theoretical framework we presented posits three main ideas around which everything else is dependent on: the first tenet is the existence of a network effect, namely, the fact that people can influence the behavior and opinions of others (a topic that will be investigated in Chapter 2). The second is the connection between geography and networks in influencing individuals, and how these two environmental levels interact to affect people’s ideas and behaviors (see Chapter 3); the third is based on the relationship between time and the network in doing the same (see Chapter 4).



## The effect of the network

### Influence mechanisms in 2014 European Elections in Italy

#### 2.1. Introduction

During the intellectual path of the so-called “social logic of politics” framework (Zuckerman 2005), a large amount of attention has been given to the role of “molecular interactions” and “hot communication” among voters (Lazarsfeld Berelson Gaudet 1944, Baker Ames Renno 2006). According to these views, communication in social networks can affect people’s voting behavior, as well as perceptions of their social environment (Berelson Lazarsfeld McPhee 1954, Huckfeldt Sprague 1995).

The most straightforward environment in which these individual responses to network effects take place is the dyadic one. As stressed in chapter 1, defining different alternatives of dyadic relationships in time leads us to identify four possible ideal-types. The first, and the most straightforward is what we can call a persistent agreement situation, in which individuals agree about a specific political topic over time; the second one is represented by what Huckfeldt and colleagues have called persistent disagreement (Huckfeldt Johnson Sprague 2004). This interactional pattern demonstrated to be, at least in the US and under certain conditions, sustainable by individuals. Given a situation of disagreement, however, two other theoretically relevant relational mechanisms can be expected in a dyadic relationship: selection, broadly speaking, can be identified with a behavior that filters out disagreeable discussants. As stressed above, several studies (Bello Rolfe 2014, Mancosu Vezzoni 2017, Schmitt-Beck Partheymüller 2016) showed that, among

the general electorate, the choice of keeping/discarding discussants does not depend on political affinity. In other words, no matter if ego and her alter disagree politically; the former will maintain relationships with the latter because of other characteristics of the discussant, such as intimacy (see Mancosu Vezzoni, 2017).

On the other side, influence is the mechanism according to which respondent and her discussant reach some kind of agreement, that is, one out of the two (or both) change their idea, reaching a situation of agreement. As Bello and Rolfe stress in their work on the topic (2014), the means by which it is possible to test systematically the presence (or absence) of these mechanisms cannot be represented by cross-sectional surveys. This type of instruments, indeed, can only give us indirect evidence of alters' pressure on the individual. Since these behaviors are relatively fine-textured, many studies employed experimental sets or panel data in order to tap these mechanisms. Nickerson (2005) and Klofstad (2007), by means of experimental approaches, show that influence can act as a potent tool of political change in people and that these changes can produce spillover effects, that is, diffusion processes that transcends the single dyadic relation. Moreover, other contributions (Fowler et al. 2011, Mollenhorts Volker Flap 2008, Rogowski Sinclair 2012) suggested the employment of repeated measures to account for patterns of influence: using a 4-waves panel collected during the 2010 British Elections, Bello and Rolfe (2014) show that influence actually represents a real outcome of dyadic relations during an election campaign. Other studies (Mancosu Vezzoni 2017; Schmitt-Beck Partheymüller 2016) test this relation in a similar fashion, drawing similar conclusions.

By means of a pre-post panel survey collected during 2014 European Elections in Italy, the chapter aims at testing whether Italians voting behavior is conditioned by influence mechanisms. The European Elections of 2014, held in Italy on May 25, represented the first electoral test for Matteo Renzi's Government. Although they can be seen as a second-order election (Reif Schmitt 1980, Marsh 1998, Hix Marsh 2007), thus less

crucial than national elections, results represented a stunning surprise for pundits, as well as an interesting turning point in the Italian political life: «the Democratic Party (PD) [...] has obtained a neat success reaching a record share of 40.8% of the votes. No center-left party had previously achieved a similar result. Since the EP elections were held in 1979, the PD is overall the Italian political party that has obtained the highest share of votes ever» (Maggini in De Sio Emanuele Maggini 2014). Compared to the result of a year before, obtained in 2013 National elections, the PD of 2014 gained around 2.5 million votes. This is an even stronger result if we take into account the fact that the turnout in European Elections was lower than in National Elections (more precisely, 17 percentage points lower with respect to 2013). The PD result almost doubled its main competitor in 2013, the Movimento 5 Stelle, which lost 1.5 million votes, gaining about 21%. The center-right coalition did not suffer, in percentages terms, of a clear debacle: the sum of Forza Italia and Nuovo Centro-Destra was around 21%, as in 2013 (Forza Italia, Berlusconi's party, gained almost 17% of valid votes while Nuovo Centro-Destra, gained the 4%). Because of the lower turnout, however, in absolute terms, the two parties, taken together, lost around 1.5 million votes from the previous National Elections. The only right-wing party that could be satisfied was the Northern League, which gained around 300.000 votes compared to 2013, gaining a respectable 6% of valid votes. Scelta Europea (the party founded by the former technocratic Prime Minister Mario Monti) almost disappeared from the electoral competition, gaining less than 1% of votes (precisely 0.7%). Given the aggregate results, we can legitimately expect a non-irrelevant level of overall volatility, which can be produced, among others, by influence mechanisms.

We must stress several differences with respect to previous works to which this chapter mainly refers (mainly Bello Rolfe 2014, but see also Schmitt-Beck Partheymüller 2016, Mancosu Vezzoni 2017): first of all, previous studies aim to find evidence (mainly) during an election campaign. The data at our

disposal, similarly to other contributions (Schmitt-Beck Partheymüller 2016; Mancosu Vezzoni 2017), are based on a 2-waves panel in a pre-post design. In order to test influence mechanism, and differently from previous literature, the testing strategy of this mechanism will adopt a “directional” approach. In other words, it will be explicitly tested whether, given a discussant who votes for a certain party A, the respondent is directed toward that party<sup>1</sup>. In order to perform these analyses, a “stacking” procedure will be employed (see below).

## 2.2. Political influence: definition and effects

Huckfeldt (1986) argues how individuals embedded in specific social (and political) networks and contexts can provide basically two different answers to their environment: from one side, they can provide consistent responses to their environment – the so-called assimilation responses. From the other side, they can react in a dissonant way to external stimuli – having, in this way, conflictual responses with respect to the environment. As stressed previously, when referring to responses to external stimuli, Huckfeldt employs a comprehensive concept of the term “environment,” using different meanings of the term. From one side, the environment is a set of relationships and peer effects enacted in co-presence. From the other side, it is also exemplified as a broader – geographical – context for the conflict response. As we stressed in the previous chapter, context is necessary to shape the propensity that one has in having an interaction with a discussant who possesses specific characteristics (see the following chapters for a more thorough review of these aspects). In other words, contexts contribute to shaping ego-networks characteristics. However, as stressed above, one’s network can be further dismembered in a number of interac-

<sup>1</sup> Bello and Rolfe strategy, rather, employs an indirect, non-directional way to test influence. See paragraph 3 of this chapter for details

tions. The individual shares with other people several levels of intimacy, frequency of political discussion, as well as, for instance, different/the same gender, social class, musical taste, and so on. The shaping properties of the contexts, combined with the fact that an ego network is nothing more than the sum of all the interactions that individuals have during their everyday life, gives us the definition of how the environment and its responses are interpreted in this work: the first assumption from which we start is that the influence mechanism that we are going to test is, primarily, a network mechanism, that is, a process based on interactions between people (Huckfeldt Sprague 1987). The second assumption states that these processes are better analyzed in a dyadic fashion, that is, considering, theoretically and technically, the dyadic interaction as the fundamental level of analysis with we are dealing (Mutz 2002, Huckfeldt Johnson Sprague 2004, Fowler et al. 2011, Bello Rolfe 2014).

In chapter 1, it has been stated that the most relevant, and theoretically investigated, outcomes of dyadic relations are, basically, four. The first one is what we called the “normal” situation, the persistent agreement. Given the possibility of having information at two different times,  $t_0$  and  $t_1$ , people who are perceived as being in persistent agreement, agree in  $t_0$  and in  $t_1$  too (an outcome that can be theorized as a homophily mechanism, see Noel Nyhan 2011). Another situation which has been reported to be unexpectedly relevant (Huckfeldt Johnson Sprague 2004) is the so-called persistent disagreement. It has been reported how people can sustain a certain level of political disagreement that persists in time. This phenomenon has been showed to be consistent both theoretically and empirically, at specific, network related, condition (see Huckfeldt Johnson Sprague 2004, Mutz 2002).

Given a situation of disagreement, an individual, rather than being in a “static” situation, can avoid interactions with her discussant, or influence (and be influenced) in her political position. Unlike one might expect, as stressed by Bello and Rolfe (2014), these mechanisms do not usually represent behaviors that undermine the relations among people in every dimension:

for instance, «[s]election of political discussants does not necessarily mean ending pre-existing relationships or befriending all Liberal Democrats that one meets; it can be as simple as choosing to sit at the opposite end of the table from politically conservative Aunt Edna at family gatherings». Similarly, influence processes must not be seen as a complete conversion from, say, an extreme right-wing view of the world to a set of liberal opinions. Usually, as shown even in long-term panels (Jennings Niemi 1981, Zuckerman Dasovic Fitzgerald 2007), short-time changes are mainly due to small variations from generally liberal (or conservative) views, to more (or less) liberal (or conservative) ideas. In other words, front-line changes are rare.

As outlined in chapter 1, these four dyadic outcomes are expected to be theoretically relevant during an election campaign. The question that can arise is: why only these four outcomes are assumed as relevant? The mechanisms that, for instance, take into account an initial agreement that results in disagreement are usually not evaluated in the literature as relevant, basically because citizens are assumed as agreement-seekers individuals. People tend to reach agreement situations, for reasons related to cognitive dissonance reduction (see Festinger 1957) or given the fact that they do not possess a rich, well-organized system of information by which it is possible to face political discussions (Downs 1954, Zaller 1992, Sidanius 1988, Sidanius Lau 1989).

As stressed above, in terms of empirical validity of our theoretical constructs we can say quite safely that, although theoretically relevant, the mechanism of selection has repeatedly been shown not to be empirically relevant in shaping people's decisions: Bello and Rolfe find that intimacy with the discussants is the primary element that makes one deciding to keep or discard this latter, while agreement does not produce relevant effects in the choice. Other studies (Mancosu Vezzoni, 2017, Schmitt-Beck Partheymüller, 2016) substantially corroborate this evidence. We have thus decided not to include a systematic test of the selection mechanism. In addition, one of these studies (Mancosu Vezzoni, 2017) is based on the same data presented

here. This would make a further test of selection mechanism redundant.

On the other side, influence can be depicted as a mechanism that is sustained by more crucial empirical evidence, which is why the chapter will focus on this latter. In the next sections, ways in which influence acts in changing patterns of disagreement among citizens will be outlined. Similarly to other studies (Partheymüller Schmitt-Beck 2012, Bello Rolfe 2014) patterns that we are going to test can be seen only in small periods of time (an election campaign or, in our case, before and after the Election day); thus, a large part of the interactions that we see in these small periods are “stable” interactions. Part of these stable situations, however, can be the result of one (or many) influence processes that happened before the observational window. Despite this, a sufficiently significant number of changes, in the waves taken into account, can be observed – moreover, in a moment in which the attention toward politics is higher than ever, that is, the period surrounding the Election day.

### 2.2.1. *Hypotheses*

Influence is the mechanism according to which people reach agreement about, in this case, political matters. «[O]ne person may change his or her mind as a result of new information, social pressure, imitation of peers or some other psychological mechanism associated with making conditional choices» (Bello Rolfe 2014). We can recognize essentially two different types of influence. Influence can be seen as a process in which one of the two nodes of the dyad stays on her position, and the other one switches toward the first, or, given to different positions in  $t_0$ , two nodes of a dyad come to some sort of intermediate position in  $t_1$ . In any case, the baseline to assess the presence of the mechanism is that, given a previous situation of disagreement, the agreement is reached by means of someone who changes her political opinion. As pointed out by Bello and Rolfe (2014), an indi-

rect hypothesis that can support our argument reads as follows:

*Hp1. an individual will be more likely to change her vote choice if, previously, was in disagreement with a discussant.*

In other words, electoral volatility is conditional to the previous situation of disagreement in the dyad.

It has been stressed in chapter 1 that the strength of social ties leads to different outcomes: first of all, political discussants belonging to different social groups can, by and large, present different degrees of social cohesiveness (Huckfeldt et al. 1995, Granovetter 1973). As a result, different levels of cohesiveness lead to differences in coercion toward the individual (Berelson Lazarsfeld McPhee 1954, Huckfeldt Sprague 1995); It is thus entirely logical to expect that familiar discussants can provide higher levels of autoregressive influence and network density, since relations are more intimate and ties are generally strong, with respect to non-familiar ones (see chapter 1 for details). The hypothesis dealing with this relationship will read as follows:

*Hp2. Disagreement with relatives will exert a stronger effect on the likelihood of changing vote compared to that of non-relatives.*

Previous literature (Bello Rolfe 2014) provides only indirect proof of the influence effects, testing whether volatility is function of the previous disagreement. In this way, we have no direct proof of the fact that the individual choice is directed actually toward the party preferred by the discussant. To overcome this drawback, and using different models (see below), a directional hypothesis can be formulated:

*Hp3. An individual will be more likely to change her vote toward the vote choice of her discussant if, previously, the dyad was a disagreeable one.*

### 2.3. Data, measurements, and models

Data of this chapter come from the ITANES 2014 panel survey. As pointed out in paragraph 1, the design of the survey is a pre-post longitudinal dataset (Schadee Segatti Bellucci 2011), in which the first wave is collected before the Election day, and the subsequent one is collected over the same individuals after the Election day. The first wave of the panel was collected from May 9 to May 19, 2014, while the post-electoral wave was collected from June 10 to June 18, 2014 (European Elections in Italy were held on May 25, 2014). Both the interviews have been conducted by means of CAWI (Computer Assisted Web Interview) mode. In the pre-election wave, 3,244 respondents were interviewed, while, in the post-electoral survey, 2,890 people accepted to be re-contacted, with a re-interview rate of 89.1%. The rate is quite above the average of those types of longitudinal surveys in Italy: for instance, the re-interview rate in the 2006 pre-post panel was around 70% (Bellucci Maraffi 2008). In each wave, respondents have been asked to provide information about their behavior and attitudes.

The individual information was not the sole information for which respondents were asked: in addition, information about characteristics of the discussants was collected. Technically, collecting information about discussants is usually performed by means of individual surveys that ask the respondents with whom they talk about important matters of their lives or, more explicitly, about politics—the so-called “name generators.” In general (Burt 1985, Huckfeldt et al. 1995, Huckfeldt et al. 1998, Huckfeldt Mendez 2008) people tend to instinctively order their discussants from the more important to the less important one. The discussant who is the first to be nominated is usually defined as the “main discussant.” This individual usually holds characteristics that differ from the remaining discussants: first, it is more likely that he belongs to an intimate social circle, such as the relatives circle (Huckfeldt et al. 1995). Second, he usually presents higher levels of agreement with the respondent. It is important to underline that the concept of main discussant

does not necessarily overlap with an intimate relationship: the main discussant can be indeed picked also among non-cohesive social groups (Huckfeldt et al. 1995). In the work that follows, the variable that will account for the network effect is the voting behavior of the main discussant. For our purposes, although not being a totally exhaustive measure, exposure to the main discussant is sufficient for investigating the relationship between networks and voting behavior. If the main discussant, that is, the first person coming to respondent's mind when asked about political discussants, is not a member of the family, we have a baseline proof that the respondent is not solely exposed to a cohesive circle, but, rather, her everyday life is marked by relationships with "weak" ties. The main drawback of this approach is that network level, in this way, is reduced to a single dyadic relation. This is, undoubtedly, a problem in terms of biases in the estimates. Although the main discussant is usually one of the people who affect the most respondents, an ego network is not the sole main discussant. This issue could lead to smaller estimates of the effects that we are going to test: assuming that the main discussant is just a part of the effect and this latter is shared among different discussants, having just one of these sources of information/influence should decrease the strength of the effect. In a certain way, however, this forced choice allows us to play against ourselves. If, besides the relatively poor information available, there is actually an effect of the "network" broadly intended (and operationalized with a single dyadic relation) that means that, with more information (namely, more discussants' information) we should see bigger coefficients.

In both the pre- and post-electoral survey, respondents were asked to report their vote intention (or their actual vote choice in the post-electoral wave), as well as the perceived voting behavior of their main discussant. Respondent has also been asked to report the social circle to which the main discussant belongs (this variable has been recoded in two theoretically relevant circles: "Relative," "Non-relative"). Also, different variables, used as control variables (see be-

low), were collected, namely, respondents' level of knowledge and party identification.

### 2.3.1. *Models*

Analysis of influence mechanism in a non-directional fashion will follow, first, the modeling strategy proposed by Bello and Rolfe (2014). The binary dependent variable is constructed in a way that is equal to 1 when respondent's vote choice in wave 2 is different from the vote choice of wave 1 and 0 otherwise. As pointed out above, several hypotheses have been taken into consideration: first of all, it has been stated that, if influence process actually exists, voting behavior changes in time are function of disagreement with the main discussant. This latter has been operationalized by comparing the reported vote choice by the respondent and the party that respondent thinks her main discussant voted.

It has been stated in the literature that several other explanations of the vote choice volatility can be hypothesized: first of all, people who were not sure of their declared vote choice during the election campaign could be more likely to have changed their mind. This could be taken into account with two variables, interest in politics (which roughly measures political sophistication, see Zaller 1992, Ahn et al. 2013) and party identification (Campbell et al., 1960). It is hypothesized that, as long as one is interested and identified with any party, as long as her choice will be stable over time.

The models can be expressed as follows:

1.  $p(\text{DIFFVOTE}_{w1w2}=1) = \text{DISC\_DISAG}_{w1} + \text{CIRCLE}_{w1} + \text{INTER}_{w1} + \text{PARTYID}_{w1}$
2.  $p(\text{DIFFVOTE}_{w1w2}=1) = \text{DISC\_DISAG}_{w1} \times \text{CIRCLE}_{w1} + \text{INTER}_{w1} + \text{PARTYID}_{w1}$

Where:

- a)  $\text{DIFFVOTE}_{w_1w_2}$  is equal to 1 if  $\text{votechoice}_{w_1} \neq \text{votechoice}_{w_2}$  and equal to 0 if  $\text{votechoice}_{w_1} = \text{votechoice}_{w_2}$ ;
- b)  $\text{DISC\_DISAG}_{w_1}$  is the perceived disagreement with discussant in wave 1;
- c)  $\text{CIRCLE}_{w_1}$  is the discussant's social circle in wave 1<sup>2</sup>;
- d)  $\text{INTER}_{w_1}$  is a 0-3 scale of interest in politics collected in wave 1;
- e)  $\text{PARTYID}_{w_1}$  is equal to 1 when the respondent is identified with any party and 0 otherwise (the variable is collected in wave 1).

In this way, we can present a systematic test of both Hp1 (the plain influence effect) and Hp2 (which argues that the strength of influence is stronger in the presence of a relative rather than a non-relative).

As pointed out above, models that test the influence mechanisms do not test if, say, respondent is pushed toward a particular party by the exposure to her discussant: more simply, they argue that disagreement leads to a higher volatility of choice, which is assumed to be directed toward the party voted by the discussant or some choice in between. According to Greene (2011) and Bello and Rolfe (2014), the choice to use a first-difference-based approach (Augustyniak Liker Duncan 1985, Greene 2003), such as that exposed in models above, allows to have unbiased estimates only if variables that are central to our understanding of the process are not related to explicit voting behavior: «Looking only at whether or not a subject changed his or her vote choice (instead of whether or not friends share similar party preferences) eliminates many issues that might arise when using cross-sectional panel data, particularly as we look only at the binary outcome of vote switching instead of

<sup>2</sup> The original question regarding main discussant (the person with whom respondent talked the most in the previous week) had 7 response categories and it has been recoded to 2: "Partner" and "Other relatives" were recoded into "Relative"; "Workmate", "Neighbor", "Other person" and "Friends" has been recoded as "Non-relative".

transitions to and from one party choice to another (Jackman and Vavreck, 2010)» (Rolfe Bello 2014).

Another, directional, version of vote switching determinants can be however argued. The way of modeling directionally influence mechanisms can be not completely orthodox. The mechanism we are dealing with is not devoted to disentangling relationships with respect to a single party: we are not interested in the relationship that exists between changing to Pdl vote choice in  $t_1$  and the main discussant's support for Pdl in  $t_0$ . Rather, we are interested in a mechanism that encompasses *every* (relevant) party. The mechanism is expected to affect in a similar way voters irrespective of the party they support. American research on social mechanisms that lead to electoral choices did not provide any technique in order to overcome this problem, given that in the American system such a problem does not arise (logistic-based models can efficiently produce tests of mechanisms that are independent of the party, since, in a two-party system, party A is – almost – the 1 complement to party B, see Huckfeldt Sprague 1995, Huckfeldt et al. 1995, Huckfeldt Johnson Sprague 2004). This testing approach will thus be based on a technique mainly developed in Europe, and more specifically, a variant of the so-called stacking procedure (van der Eijk et al. 2006).

Stacking transforms the data matrix from a case\*variable matrix to a choices\*case\*variables one. In other words, a single case does not represent an individual anymore. Rather, it represents a particular choice with respect to a party. Imagine a situation as that depicted in Table 2.1. The table exemplifies three respondents (marked by the ID variable) in a stacked data matrix. Columns 1 and 2 represent what stacking procedure does to the matrix, leading to observations that no more represent individuals, but rather a choice\*individual combination. Columns 3 and 4 present, in this example, interest in politics of every fictitious individual ( $INTER_{w1}$ ) and a reshaped measure of party identification. In that case,  $PID_{w1}$  is 1 when the respondent is identified with a specific party and 0 otherwise.

**Table 2.1.** Stacked data matrix example.

ID	CH.	INTER <sub>w1</sub>	PID <sub>w1</sub>	VOTE <sub>w1</sub>	VOTE <sub>w2</sub>	SWITCH <sub>w1w2</sub>	DISCVOTE <sub>w1</sub>
1	1	2	1	1	0	0	1
1	2	2	0	0	0	0	0
1	3	2	0	0	1	1	0
2	1	1	0	0	1	1	1
2	2	1	1	1	0	0	0
2	3	1	0	0	0	0	0
3	1	0	0	0	0	0	0
3	2	0	0	0	0	0	1
3	3	0	0	1	1	0	0

As pointed out in other works (van der Eijk Franklin 1996, van der Eijk et al. 2006) stacking procedures can be applied to binomial dependent variables, namely ipsative measures, such as those expressed in voting behavior. In this way, it is possible to put as dependent variable the vote choice in wave 2 (column 6 of Table 2.1) with, as a predictor, the party identification of an individual, modeling the association by mean of a logistic regression model. Our aims, however, are different: rather than predicting vote choice in a specific time, in order to recognize directional influence effects, we want to predict the change from one status to another. As shown in column 7 of Table 2.1, this is possible by constructing a variable equal to 1 when the respondent has passed from another party in wave 1 to support that choice in wave 2 and 0 otherwise (in the example, the variable is SWITCH<sub>w1w2</sub>). In that way, it is possible to predict the variable by means of the (exogenous, since it is previous in time) discussant's perceived vote choice in wave 1 (exemplified in column 8). Obviously, the question that we are making ourselves is slightly different with respect to the hypothesis testing presented in the non-directional model, borrowed from Bello and Rolfe (2014). We are interested, indeed, whether a discussant's effect on the switching choice is recognizable.

For what concerns the independent predictors, we can say that not all the variables are “naturally” arranged to be stacked: interest in politics, already defined in table 2.1, for instance, needs a slightly different treatment. Imagine a two-party system, composed of party A and party B. Imagine an individual regressor, say interest in politics. Imagine that high interest could affect positively switching toward party/coalition A and negatively party/coalition B. Thus, regression estimates of the individual characteristics of a stacked data matrix would be nonsensical. Imagine, for instance, that, by employing just party A switch, the effect of interest is equal to  $k$ , while is  $-k$  when considering only switches to party B. The total effect of the stacked matrix will be 0. In order to overcome this problem, the y-hat technique will be employed (Franklin van der Eijk 1996, van der Brug van der Eijk Franklin 2007): a y-hat variable is constituted by the predicted values of a bivariate regression performed on every single “stack” (that is, on every single choice). In this way, it is possible to estimate the impact of the regressors on our dependent stacked variable. In this work, independent y-hat variables (applied on interest in politics) have no substantive meaning and are used just as a control variable, but it is worth to remember that, from the substantive interpretation side, the bigger the y-hat, the more the variable has an impact on the dependent variable (van der Eijk et al. 2006).

Logistic model presented below will be fitted with robust standard errors in order to avoid erroneously significant estimates, due to the multiplication of cases (the models that follow present stacking for the nine main choices available in 2014 Elections<sup>3</sup>). Below is presented the formalization of the directional model:

<sup>3</sup> More precisely, the stacking procedures encompasses choices for Forza Italia, Fratelli d’Italia, Lista Tsipras, Lega Nord, Movimento 5 Stelle, Nuovo Centro Destra, Partito Democratico, Scelta Europea, UDC.

3.  $p(\text{DIFFVOTE}_{w1w2}=1) = \text{DISC\_VOTE}_{w1}$
4.  $p(\text{DIFFVOTE}_{w1w2}=1) = \text{DISC\_VOTE}_{w1} + \text{CIRCLE}_{w1} + \text{Y\_INTER}_{w1} + \text{PID}_{w1}$
5.  $p(\text{DIFFVOTE}_{w1w2}=1) = \text{DISC\_VOTE}_{w1} \times \text{CIRCLE}_{w1} + \text{Y\_INTER}_{w1} + \text{PID}_{w1}$

Where:

- a)  $\text{DIFFVOTE}_{w1w2}$  is equal to 1 if  $\text{VOTE}_{w1} = 0$  &  $\text{VOTE}_{w2} = 1$ ; equal to 0 otherwise;
- b)  $\text{DISC\_VOTE}_{w1}$  is discussant vote choice in wave 1 and 0 otherwise;
- c)  $\text{CIRCLE}_{w1}$  is the discussant's social circle in the pre-electoral wave;
- d)  $\text{INTER}_{w1}$  is the y-hat of the 0-3 scale of interest in politics collected in wave 1;
- e)  $\text{PARTYID}_{w1}$  is equal to 1 when the respondent is identified with any party and 0 otherwise.

The subsequent paragraph provides useful insights for the multivariate analyses<sup>4</sup>.

## 2.4. Results

### 2.4.1. Influence mechanism

Models presented in Table 2.2 accounts for the first two hypotheses that have been argued in paragraph 2.1. As shown in Model 1 of Table 2.2, disagreement in the dyad is a strong predictor of the vote choice change in the second wave. In other words, consistently with other studies (Mutz 2002, Bello Rolfe 2014), influence mechanism seems to hold empirically. Marginal effects show that a situation of disagreement between dis-

<sup>4</sup> Descriptive statistics for the variables employed in the chapter are available in the Online appendix of this book, and can be found at [morenomancosu.github.io](https://morenomancosu.github.io)

cussant and her respondent in wave 1 leads to a 22-point higher propensity to change her vote choice. Moreover, as easily conceivable, both interest and party identification, which measure indirectly the certainty with which people were going to vote for the party, represents a strong predictor of the probability of changing mind too.

**Table 2.2.** Testing influence processes (2 logistic regression models).

Indep. Variables	Model 1	Model 2
Disagreement <sub>w1</sub>	1.11*** (0.14)	1.09*** (0.21)
Circle: Non-relative <sub>w1</sub> (ref. Relative)	0.12 (0.12)	0.11 (0.15)
Disagreement * Circle		0.04 (0.28)
Interest in politics <sub>w1</sub>	-0.78*** (0.25)	-0.78*** (0.25)
Party identification <sub>w1</sub> (ref. Not identified)	-0.74*** (0.26)	-0.74*** (0.26)
Constant	-0.27 (0.31)	-0.26 (0.31)
Observations	1,551	1,551

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

For what concerns Model 2, things are slightly different. As anticipated in paragraphs 2 and 3, Model 2 tests the hypothesis that disagreement influences the propensity to be more volatile and, thus, to change vote choice in time, according to the circle of the discussant. First of all, the certainty of the voting behavior, measured by party identification and interest, remains significant and consistent with the hypotheses. From what emerges in the data, there is no difference of intimacy in the influence effect – the interaction between disa-

greement and intimacy is not significant. Our Hp2 is thus not corroborated, for what concerns non-directional influence testing.

#### 2.4.2. *Directional influence*

So far, results have focused on adapting models firstly adopted by Bello and Rolfe (2014) to the Italian situation during the 2014 European Elections. Consistent with previous results, it has been shown that there is empirical evidence supporting mechanisms that are compatible with an influence process. However, as previously stated, these proofs are only indirect. In other words, the fact that disagreement can lead an individual to change her vote choice does not assure us of the fact that the change of individual is toward the party voted by her discussant. The volatility, for instance, could be directed farther with respect to the disagreeable discussant – a process that is compatible with polarization mechanisms (Baldassarri Bearman 2007). As pointed out above, several influence mechanisms, with different outcomes, can be investigated: for instance, given a respondent and her discussant, the first can be pulled toward the second's opinion, the second can be pulled toward the first's opinion or both the discussants can agree to vote some sort of halfway. In this work, only the first case will be taken into account. As pointed out in the previous paragraph, three models will be fitted in order to provide a directional test of the influence. The matrix for these models is a stacked data matrix: that means that cases, instead of representing individuals, represent a choice\*individual combination. The dependent variable is one if the respondent has switched toward a particular party and 0 otherwise – thus, for other choice\*respondent combinations. The relevant predictor, on the other side, is the party the discussant had voted for in the first wave, according to the respondent. As it is possible to assess from Model 3 in Table 2.3 the effect of discussant's vote choice is positive and significant: in other words, discussant's vote choice for a generic party enhances the likelihood that respondent has to switch toward the

same, generic party. However, the model is just a bivariate one, and other alternative explanations are not fitted in it. Model 4 in Table 2.3 adds those variables, mainly represented by a stacked version of party identification, which indicates which political alternative respondents feel closer to, and interest, treated with the y-hat method.

**Table 2.3.** Testing influence processes directionally (2 logistic regression model).

Indep. Variables	Model 3	Model 4	Model 5
Discussant vote choice <sub>w1</sub>	1.13*** (0.14)	0.56* (0.31)	0.58* (0.35)
Circle: Non-relative <sub>w1</sub> (ref. Relative)			-0.02 (0.12)
Vote choice * Circle			-0.02 (0.28)
Interest in politics(y-hat) <sub>w1</sub>		0.29 (0.33)	0.28 (0.33)
Party identification <sub>w1</sub> (ref. Not identified)		0.80*** (0.30)	0.80*** (0.30)
Constant	-4.20*** (0.06)	-4.41*** (0.21)	-4.40*** (0.22)
Respondents	1,962	1,962	1,962
Observations	17,658	17,658	17,658

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We can see from Table 2.3 that especially party identification leads to robust coefficients in the model (if ego is partisan of a particular party and votes in  $t_0$  for another party, it is very likely that, if changes, she will change toward the party with which is identified). Although the discussant's vote choice coefficients lose significance and magnitude, it remains significant to the level of 10%. Finally, Model 5 assesses whether the effect of

discussant's choice is different according to the circle to which discussant belongs. Also in this case, and similarly to the non-directional case, the interaction coefficient is small and non-significant.

## 2.5. Discussion

In chapter 1, it has been argued that people can respond to their environment in, basically, two ways: citizens can conform, leading in this way to assimilation responses, or, rather, they can adopt strategies in order to provide conflict responses. As pointed out above, Huckfeldt conceptualization of the environment concept (mainly when referring to conflict and assimilation) treated the "environment" theoretical construct in a broad sense. In this work responses to the environment have been conceptualized as relational responses, that is, reactions to interpersonal political communication. The concept of political disagreement has been thus identified as the engine of relational mechanisms that can be enacted by individuals in dyadic relations. As stressed many times in this work, a large part of the literature has, since the first, seminal works on the topic (Berelson Lazarsfeld McPhee 1954), assumed citizens as agreement-seekers individuals: in other words, the tendency that people have in their political relations is, generally speaking, to conform to the ideas of the dominant opinion with respect to being involved in political quarrels. As showed since Leo Festinger's studies, indeed, disagreement leads to stressful situations and, consequently, to cognitive dissonance reduction strategies (Festinger 1957).

As pointed out above, persistent agreement and disagreement are not the sole conditions in which citizens live, but other relational dynamic mechanisms can be recognized: in this chapter, in particular, one mechanism, influence (Bello Rolfe 2014), has been tested. It has been shown that levels of disagreement with the main discussant influence the propensity of change vote choice. Moreover, it seems that the social circle of the dis-

cussant to whom one is exposed does not lead to stronger effects of influence – namely, we do not see higher levels of volatility once one is exposed to a disagreeable strong tie with respect to a weak tie.

As stressed several times in this work, this result can be accepted as a solely indirect proof of the influence mechanism. Basically, if the relation tells us that disagreement increases the propensity to change vote choice for the respondent, does not tell us anything about the direction of this change. The volatility that we see could thus be due to polarization trends, which would push people farther. In order to test directionally influence mechanism, a different technique (based on stacking) has been employed. Results of this latter model show that influence mechanism also holds directionally, consistent with the expectations that see people as agreement-seekers.

The chapter presents some limits, especially from the data-related side. First of all, we can state that a better understanding of the argued dyadic processes can be reached by the employment of more complete network data. Employing information concerning a single discussant, although leading to the same results obtained by Bello and Rolfe (2014), could be insufficient to isolate processes that could turn out to be significant with information on more discussants.

If we were aimed at summarizing our results, and at interpreting what they mean substantively, we should get to the conclusion that conforming strategies exert a strong influence on citizens. The next chapter is going to test whether the dyadic mechanisms of influence interact with the broader environment, with particular reference to the local geographical one.



## Networks and the geographical context in Italy

### Interacting sub-national environments in 2013 National Elections

#### **3.1. Introduction**

According to the “social logic of politics” voting is, among other things, a social activity: discussion networks represent the environment in which people structure their attitudes and political preferences (Berelson Lazarsfeld McPhee 1954; Huckfeldt Sprague 1995; Huckfeldt Johnson Sprague 2004; Zuckerman 2005). Political discussions with other citizens can crystallize, slightly change or even throw into crisis one’s ideas, beliefs and opinions. However, as pointed out in chapter 1, discussions with friends, co-workers, and relatives are not the only source of political information and influence in a contemporary democracy. The local climate, by shaping the structural context of individual opportunities of encountering a supporter of a particular party, contributes to affecting individuals voting behaviors and political opinions.

Research applying these approaches and focusing on the relationship between discussion networks, contexts and voting behavior has investigated either extremely stable (Huckfeldt Sprague 1987, Huckfeldt Johnson Sprague 2004; Mancosu 2016) or unstable political systems, such as young democracies (Baker Ames Renno 2006). The Italian situation in 2013 can be described as a case in between these two extremes (Bellucci Segatti 2013, Bellucci Maraffi 2014): the Italian political landscape in that moment was characterized by a period of high instability. This political turmoil culmi-

nated in November 2011, when the worsening of the economic crisis, an increasingly weak majority and the lack of international credibility led Silvio Berlusconi to resign as prime minister, after almost four years in government (Bellucci Costa Lobo Lewis-Beck 2012; Vegetti Poletti Segatti 2013). His office was taken by Mr. Mario Monti, who headed a technical government, aimed at achieving economic reforms and austerity measures vigorously requested by the EU. The electoral climate was profoundly affected by the political turmoil that characterized the years of the economic crisis in Italy. From one side, despite changing their names, a part of the most relevant parties in the Italian political landscape remained substantially stable. In 2013, support for Pierluigi Bersani's Partito Democratico (Democratic Party, PD) was rooted in the left-wing tradition, starting from the end of the Second World War (continuing, even if changing dramatically in the ideological tenets, the legacy of the Italian Communist Party, see Trigilia 1981, Anderlini 2007). In the right-wing area, the legacy of the Christian Democrats was continued by Berlusconi's Popolo della Libertà (The Freedom People, Pdl) and its small, more extremist ally, the Lega Nord (the Northern League, Tarchi 1998, Shin Agnew 2002, Shin Agnew 2007, Diamanti 2003, ITANES 2013, Passarelli Tuorto 2013). As seen above, however, 2013 elections witnessed the appearance of new political alternatives characterized by a harshly critical attitude toward the established party system. Along with the Movimento 5 Stelle – that, in 2013, at its first appearance in a general election, gained 25% of the valid votes becoming the largest party in the country – other parties have tried, with less success, to represent an alternative to the old party system. The case of Scelta Civica is enlightening of this attempt: as will be deepened below, the coalition of Scelta Civica, led by the leader of the Government, Mario Monti, was a (partly failed) attempt to provide a liberal right-wing party in Italy that could challenge Berlusconi's strength in that area of political spec-

trum (De Sio et al 2013, D'Alimonte Di Virgilio Maggini 2014).

In this fluid situation, there will be attempted to test several hypotheses concerning the social mechanisms that are at work both at the local geographical and at the discussion networks levels. More specifically, it will be investigated (i) whether both the network and the local geographical contexts actually contribute to shaping individual vote choices; (ii) whether these two environments interact, and how; (iii) whether the familiar environment exert, as stressed above, a stronger effect on individuals' vote choices with respect to the non-relatives' one. The theoretical framework presented in chapter 1 will be extended and several hypotheses, focused on the case study, will be tested.

### **3.2. The role of contexts and networks in shaping vote choices**

As pointed out in chapter 1, context affects people by changing the distribution of opportunities that they have in establishing a discussion. As explained by the literature (Blau 1977, Huckfeldt 1986, Baybeck McClurg 2006), a context that presents, say, a large number of Republicans contributes to shaping the likelihood of relationship that one can have with a Republican – enhancing the likelihood of engaging in a political discussion with this latter. The actual pressure mechanisms, however, are not enacted by means of the simple proximity between an individual and discussants presenting specific properties. Convincing or reinforcing a person's beliefs and opinions, as shown in chapter 2, is possible through interpersonal communication among people (Eulau 1986, Huckfeldt 1986, Huckfeldt Sprague 1995). That is, if context contributes to preparing the conditions under which the interactions can take place, the interaction itself affects individuals' beliefs, values and opinions.

Combining the works of political scientists (Huckfeldt 1986, Huckfeldt Sprague 1995; Baybeck McClurg 2005) and political

geographers (Agnew 1987), however, it is possible to refine these generic statements. Given an individual who is embedded in a particular geographical environment and establishes dyadic relationships with other citizens in her everyday life, we can easily state that geographical patterns of political loyalties (that is, the context) contain a large number of people with which our individual is usually engaged in conversation (that is, the network). At the same time, network with which our ego relates to is nothing more than the aggregation of all the dyadic relations the individual has. From the conceptual side, we can define these various sources as multiple – nested – levels of environmental pressure (Huckfeldt 1986, Huckfeldt Sprague 1987, Huckfeldt Sprague 1995).

The top level – that is “top” when we talk about sub-national geographical effects in a single constraints set, namely, a country-election combination – is the local geographical level. It provides the context of opportunities that shapes the network of relations that one has. This context is represented by the distribution of opinions at the sub-national geographical level (for instance, how many voters of the various main parties are present in a municipality). We can argue that the individual is exposed to the geographical context in a probabilistic way (Berelson Lazarsfeld McPhee, 1954; Huckfeldt Sprague 1987; Baybeck McClurg 2005). As long as party A is stronger in a local context, as long as the set of possible social relationships embedded in this context will see a stronger presence of party A’s supporters as discussants (Huckfeldt Sprague 1987, Baybeck McClurg, 2005). Also, when the time for an election is close, people can also come in contact with non-interactional political messages coming from the local context, such as those printed on yard signs or lapel pins (Huckfeldt and Sprague, 1995).

Nevertheless, citizens do not interact with discussants they pick randomly from the territory. People share a certain number of “social spaces” with their relevant others (Huckfeldt and Sprague, 1995; Baybeck McClurg, 2005), namely, formal or informal groups in which they can socially interact, such as

churches, workplaces, neighborhoods, public places, and so on. The social network in which individuals are embedded, also defined as ego network (Knoke 1990), is the interactional environment in which relations and patterns of interpersonal pressure take place.

It is possible to expect that, taken singularly, the different levels of environmental pressure exert an effect on the individual. As shown in chapter 2, given an individual and her discussants, the likelihood of showing a specific individual political opinion (for instance, voting for a certain party) will be enhanced by the exposure to discussants holding that attitude. At the same time, given an individual embedded in a context, we expect that the viability of a particular party will be function of that party in the local environment. The direct effect of the local environment, even though it is not explicitly theorized, should be expected because of an argument exposed above: the prevalence of an opinion in a sub-national geographic space leads, indeed, to enhance the likelihood of random encounters with people who hold that opinion<sup>1</sup>. Also, non-interactional cues and sources of influence can contribute to making people more aware of the political color of their context.

The first hypothesis summarizes the effect of both these sources of influence and reads as follows.

*Hp1a. Being exposed to discussants who vote for a particular party will enhance the individual viability of that party.*

*Hp1b. The strength of the party in the local context will enhance the viability of that party.*

It has been stressed how social groups can provide different levels of sensitivity to the broader contexts, according to their cohesiveness (Huckfeldt Sprague 1987; Mancosu 2016). It has

<sup>1</sup> According to this argument, the context can provide a sort of indirect operationalization of relations that are usually not measurable by means of survey tools.

also been argued that sensitivity and cohesiveness represent some sort of tradeoff: more cohesiveness means a weaker sensitivity to the broader context. As stressed above, sensitivity is a way of “understanding,” being exposed to, and affected by the broader context, or the “public opinion climate.” With different degrees, determined by the group in which an individual is embedded, network contributes to altering the picture of the context that the individual has: in other words, like a funhouse mirror, network contributes to give a more or less distorted image of “what is going on” in the broader climate of opinion. At the same time, interactions make individuals more or less biased to this perceived context and, thus, more or less prone to be affected by the perception they have about it. We can argue, thus, that network alters the relationship between individuals and the public opinion in two ways. First of all, it alters perceptions about prevalence that different political ideas have in the public debate. As Huckfeldt and Sprague (1987) point out, the exposure to certain parties’ supporters modifies – at different levels, according to the nature of the discussant – the idea of how the broader context is distributed (Huckfeldt Sprague 1987). This kind of cognitive sensitivity to the broader context is strictly connected with another type of sensitivity, that we can call political sensitivity; the network contributes to change the reactions that the individual has toward different levels of political strength in the context. Imagine a situation in which our ego is exposed to party A supporters with whom she interacts in her everyday life, talking, besides other topics, about politics. If the broader environment (the context) tends to support other parties, the individual will be primarily affected by her network, which represents the main source of political information. This pattern is increasingly more difficult when the party becomes stronger in the broader context: in that case, the effect of the network is expected to be lower, because the other source of environmental influence is becoming stronger, and the individual is exposed, on many more occasions, to situations in which the arguments of the strong-in-the-context party are defended (Mancosu 2016). This argument, indirectly, states that the ex-

posure to political opinions and the distribution of such opinions on the territory *interact*, and, more precisely, that there is a tradeoff between context and networks. As long as the broader context supports a party strongly, as long as individual electoral choices are more affected by this stronger effect and, consistently, the network effect is lower (Huckfeldt Sprague 1995, Mutz 2002, Mutz Mondak 2006, Huckfeldt et al. 2004). The second hypothesis will thus read as follows.

*Hp2. Being exposed to an increased strength of a party in the local context will lead to a lower importance of the network effect.*

Sensitivity, thus, is a sort of measure of how the network allows the individual to correctly perceive, and be affected by, the broader context. We have stated above that this effect is weaker in people surrounded by strong-tied networks – namely, cohesive social groups – and stronger in people who are surrounded by discussants who are a better approximation of the actual political climate in the context – namely, non-relative groups, which are characterized by weaker ties: if less cohesive groups guarantee higher levels of awareness of the larger public opinion climate, then they guarantee an unbiased idea about the environment too. On the contrary, thus, more cohesive groups will lead to distorted perceptions, as well as conflictual reactions, toward the broader environment (Huckfeldt et al. 1995). It is possible to hypothesize, thus, that the capacity that strong ties have in altering – cognitively and politically – individuals is stronger. If the second hypothesis holds, thus, we must expect that the tradeoff between context and network would be stronger with people exposed mainly to weak ties and is weaker with strong ties (which affect the individual no matter of the prevalence of parties in the broader context). Imagine, again, a situation in which our reference individual is exposed to party A supporters who are also relatives: if it is true that, together with higher levels of cohesion, we can identify higher levels of homogeneity and coercion toward the individual, the “filtering” of

the external environment produced by the network will be stronger, and party prevalence effect weaker (Mancosu 2016). The third hypothesis, thus, will read as follows:

*Hp3. Intimate discussants – family members – will exert a stronger pressure compared to non-intimate discussants – namely, non-relatives – in avoiding the local context effect.*

### 3.3. Data, models and variables

To test the hypotheses presented above, ITANES 2013 election study data will be employed, in particular, the 2013 post-electoral follow-up to the Rolling Cross-Section (RCS) campaign survey. Interviews were administered by employing a CAWI (Computer Assisted Web Interview) method. 3,000 respondents who answered the RCS questionnaire were re-contacted for the post-election follow-up. Individuals in the second wave were selected according to the proportions in the Italian population for age, gender, geographical area and vote choice in 2013 National Elections<sup>2</sup>. As pointed out in Chapter 2, networks are, ultimately, the aggregation of many discussants with whom the individual relates to. The questionnaire was thus designed to gather information about main discussant's perceived voting behavior. The main discussant has been identified as the person with whom the respondent talked more about politics recently (see chapter 2).

From the context side, the variable that will account for the contextual effect is the strength of relevant parties at the municipality level, that is, its percentage results in 2013 National Election. Since an important amount of works on multiple levels of environmental pressure were based on the American data,

<sup>2</sup> 91% of the interviews (2,812) was completed between March 29 and April 4, 2013. 196 respondents were added subsequently in order to reach the objective of 3,000 interviews in the second wave (these latter respondents are substitutions).

in the literature the employment of the geographical context is based on the concept of “majority party” (Huckfeldt Sprague 1995, Huckfeldt et al. 1995, McClurg 2006): the American political system is a two-party one, and the most straightforward interpretation of a geographical context in US politics is represented by the definition of which of the two parties is dominant. The Italian case is different – as it is in most European countries. In a fragmented, multiparty system there is no majority party (at least, the majority is not absolute, as in US system, but relative). This situation is even more accurate in the Italian 2013 case. In this case, the focus will be on party strength respect than to party majority.

Our purpose is to model voter’s perceived viability of different parties as an electoral option, given their exposure to diverse types of discussants and the contextual set of opportunities. A promising candidate to become the dependent variable is the propensity to vote (henceforth ptv) for the main parties that ran in 2013 Italian National Elections (Tillie 1995; van der Eijk Franklin 1996; van der Eijk et al. 2006). ITANES 2013 RCS follow-up presents the classical formulation of the question: respondents are asked to indicate, on an 11-point scale, how likely it is that they will ever vote for several parties.

As Van der Eijk points out (van der Eijk et al. 2006) ptv’s are a non-ipsative measure, this means that a high ptv for party A does not necessarily lead to low values of ptv for party B, C or D. Psychological processes implying propensity to vote measures differ from those related to vote choice, in which having voted for a party implies, automatically, that all the other parties have not been chosen by the respondent. Research showed that the party that receives the highest ptv is the most likely to be chosen in the actual vote choice, but, at the same time, it has been demonstrated that «in all member states of the EU there are a substantial number of voters whose preference for the second most preferred party lags only minimally behind their preference for the most preferred one» (van der Brug van der Eijk Franklin 2007). In this case, a slight difference at the level of national constraints (for instance, at the level of party

competition), can change the rank order of the preferred party for that individual, leading eventually to a different vote choice.

Much literature has employed ptv's for comparative (namely, cross-national) analysis. In this chapter, however, the investigation of ptv's in a single national context allows us to study also the attitudes toward parties people have not voted for, something that would be impossible with the employment of binary vote intention or with vote recall variables. Broadly speaking, ptv's can be seen as an overall synthetic judgment of the main parties as political objects that can possess, to voters' eyes, characteristics that make them a more (or less) attractive political options (Vezzoni Mancosu 2016).

The main aim of this chapter is to test a generic set of mechanisms that relate contextual structures of opportunity, networks, and propensity to vote for a party. In this case, the party we address to is not a single party: we are not interested in the relationship that exists between, say, how the local strength of Pdl and the main discussant's support for Pdl modify individuals' propensities to vote for the Pdl. Again, similarly to Chapter 2, we are interested in a mechanism that encompasses every party. As in Chapter 2, we will employ the technique of stacking (van der Eijk et al. 2006).

As stressed in the previous chapter, stacking procedures transform the data matrix from a case\*variable matrix to a choices\*case\*variables one. Some variables (e.g., party utilities, discussant's voting behavior and municipal percentages of party strength) are naturally arranged to be stacked. Since ptv's are collected for every case and for the five main parties that ran in 2013 elections (the Pdl, the Pd, the Northern League, Scelta Civica and Movimento 5 Stelle), the stacking procedure will multiply the cases by 5.

Individual-level variables, such as age and gender, have been treated with the  $\hat{y}$  transformation. As stressed in the previous chapter, a  $\hat{y}$  variable is constituted by the predicted values of a bivariate regression performed on every single "stack". In this way, it is possible to estimate the impact of the regressors on our dependent stacked variable. Al-

so in this chapter, independent  $\hat{y}$  variables have no substantive meaning and are used just as control variables (also in this situation, the substantive interpretation of the  $\hat{y}$  is the bigger the  $\hat{y}$ , the more the variable has an impact on the dependent variable, see van der Eijk et al. 2006).

We can now identify three nested conceptual levels in our dataset: a first level, that is, the choice level, a second one, which is the individual level, and a third one, which is the municipal level. Stacking procedure increases the degrees of freedom and can lead to too tight standard errors. To overcome this issue, it has been proposed to perform a clustering of the standard errors, using multilevel linear random-intercept models (Gelman Hill 2006, Snijders Bosker 1999). In the considered models, the third conceptual level, the geographical one, will not be treated as a nesting level: tests on this procedure have been conducted and demonstrated that too few individuals nested in municipalities would lead to biased estimates of the variance of the intercept for the third level (the number of municipalities in which is nested just an individual is around half of the sample, see Gelman Hill 2006).

### 3.3.1. *Models*

Three models have been fitted to test our hypotheses. The first one just gives us a plain test of the actual correlation that the geographical and network characteristics exert on propensities to vote, that is, the first hypothesis. However, it is necessary to stress, especially for what concerns the context effect, that it is problematic to state that an effect of the local geographical strength of parties means that the general climate influences the individuals: the effect, indeed, could be due to sampling bias, namely, the fact that probabilities of picking a specific party supporters randomly in a certain geographical context are correlated with the strength of that party in that context (see Baybeck McClurg 2005).

The second model introduces an interaction between geographical and network variables. This interaction has two main aims: partially avoiding the sampling bias stressed above, and testing whether there is actually a tradeoff between network and context effects like hypothesized above.

The last model deals with the differentiated effects of relatives and non-relatives, assessing whether the tradeoff is stronger among the former. If the relative circle actually represents a bubble that filters out inconsistent political views, our empirical expectation will be that respondents exposed to a relative discussant will be exposed to a similar network effect, irrespective from the increasing strength of a generic party in the broader context. At the same time, the tradeoff effect should be seen among those exposed to a non-relative discussant.

Several control variables are inserted in order to account for compositional effects. In particular, we control by 3 alternative explanations that can alter the relation between *ptv*'s and our variables of interest: first, as it has been shown in previous literature, 2013 elections have seen an increase of a generation gap in Italian voting behavior: younger people tended more likely to vote for the Movimento 5 Stelle (Mosca Vaccari 2013, Biorcio Natale 2013, Diamanti 2014, Vezzoni Mancosu 2016). We will thus include in the model respondents' age as a control. Similarly, it will be included educational level (coded in "Low," "Medium" and "High") of respondents as a control, since a significant amount of literature (e.g., Barisione 2001) stresses that in Italy low educated voters (as well as not interested voters) tend to vote more for center-right parties. The last control is represented by the private/public sector in which respondent works or worked (a third category is represented by those who do not have a job and never had it, such as housewives and students).

The literature (see Ballarino Schadee Vezzoni 2009), indeed, showed that public sector employees tend to vote massively for center-left parties.

All these controls will be treated with the y-hat procedure<sup>3</sup>.

Formalizing, the models are estimated as follows:

1.  $PTV = DISC\_VOT + LVOTE + Y\_EDU + Y\_GENDER + Y\_AGE + Y\_INTER + Y\_SECT$
2.  $PTV = LVOTE \times DISC\_VOT + Y\_EDU + Y\_GENDER + Y\_AGE + Y\_INTER + Y\_SECT$
3.  $PTV = LVOTE \times DISC\_VOT \times NET + Y\_EDU + Y\_GENDER + Y\_AGE + Y\_INTER + Y\_SECT$

Where:

- a) PTV is the propensity to vote for the parties;
- b) DISC\_VOT is a dummy that identifies whether the main discussant voted or not for the selected party;
- c) LVOTE is the percentage strength of the party (on valid votes) at the municipality level;
- d) NET is a binomial variable that accounts for a relative or non-relative discussant;
- e) Y\_EDU is the y-hat for the educational level (four levels: Elementary school, Middle school, High school and university degree);
- f) Y\_GENDER is the y-hat for gender;
- g) Y\_AGE is the y-hat for age;
- h) Y\_INTER is the y-hat for a 0-3 scale of interest in politics;
- i) Y\_SECT is the y-hat for the sector of employment (3 levels: “Private sector,” “Public sector” and “Not working/Retired/Housewife”).

It is important to stress that this model specification does not assure us to be free of sources of endogeneity: for instance, it is still impossible to assess precisely whether these effects are

<sup>3</sup> As for Chapter 2, descriptive statistics for the variables employed in the chapter are available in the Online appendix of this book, and can be found at [morenomancosu.github.io](https://morenomancosu.github.io)

**Table 3.1.** Multilevel regression models to study the propensity to vote for a generic party.

Indep. Variables	Model 1	Model 2	Model 3
Local vote (generic party)	0.03*** (0.00)	0.03*** (0.00)	0.02*** (0.00)
Discussant vote choice	4.57*** (0.08)	5.02*** (0.24)	5.45*** (0.30)
Disc. Vote * local vote		-0.02** (0.01)	-0.01 (0.01)
Circle: non-relative (ref. Relative)			0.10 (0.13)
Circle * Local vote			0.02*** (0.01)
Dic.vote * Circle			-1.19** (0.49)
Disc. Vote * Circle * Loc. vote			-0.03 (0.02)
Education level (y-hat)	0.68*** (0.12)	0.68*** (0.12)	0.66*** (0.12)
Gender (y-hat)	1.18*** (0.26)	1.18*** (0.26)	1.11*** (0.26)
Age (y-hat)	0.55*** (0.08)	0.56*** (0.08)	0.56*** (0.08)
Interest in politics (y-hat)	0.37** (0.16)	0.37** (0.16)	0.34** (0.16)
Sector (y-hat)	0.37*** (0.13)	0.37*** (0.13)	0.37*** (0.13)
Constant	1.53*** (0.06)	1.49*** (0.06)	1.45*** (0.08)
Level-2 variance (ln)	-2.19 (2.55)	-6.99*** (0.54)	-1.78 (1.13)
Level-1 variance (ln)	1.06*** (0.01)	1.06*** (0.01)	1.05*** (0.01)
Respondents	1,752	1,752	1,752
Observations	8,703	8,703	8,703

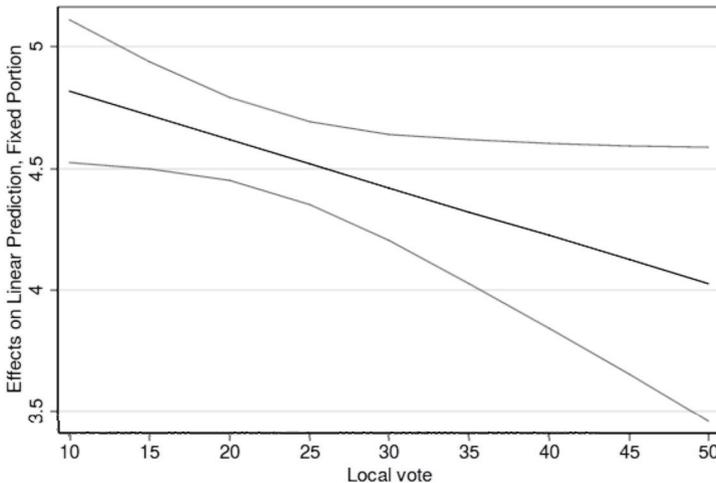
Standard errors in parentheses - \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

moved upwards by or homophily factors (Noel Nyhan 2011). We will investigate this limit in the last paragraph of this chapter.

### 3.4. Results

As pointed out above, three models will be fitted to test our expectations. First, it is interesting to comment briefly the variables that have been employed to control for possible compositional effects. As stressed in previous sections, educational level, gender, age, interest in politics, and working sector were inserted in their (centered)  $\hat{y}$  version.  $\hat{y}$ -hat parameters estimates show the importance that every regressor has in explaining the variable (van der Eijk et al. 2006). All control variables are significant, that is, they discriminate for the propensities to vote for one party with respect to vote for another.

For what concerns our substantive predictors, it is possible to see in model 1 (Table 3.1) that both the municipal level of the party and discussant vote enhance the propensity to vote for



**Figure 3.2.** AME for Model 3 – Main discussant’s vote choice (by relative and non-relative main discussant).

the generic party. A party which has been voted by the discussant – or, better, which respondent perceives the discussant voted – raises the propensity to vote for that party by 4.6 points. The estimate represents almost half (0-10) of the range of dependent variable. The local vote for the party, moreover, presents a significant coefficient of 0.03: a difference of 40 points (that represent the 80% of the distribution of the parties' strength) leads to 1.2 points higher ptv. In other words, belonging to a geographical environment that is more favorable to a certain party leads to higher propensities to vote for that party, that is, to a higher level of considering the party as a viable option.

The second hypothesis states that being exposed to other individuals interacts with the geographical prevalence of the party in the context. The way to test this is by providing an interaction between the dummy variable of discussant's vote choice and municipality strength of the party. As Table 3.1 and Figure 3.1 report, the interaction is negative and significant. In other words, as long as the party is stronger in a certain context, as long as the marginal effect of main discussant's choice on respondent's ptv is lower. Hypothesis 2 seems thus to be supported by data.

The third hypothesis, however, states that discussants who are also relatives—that is, people who are part of cohesive social groups—should exert a higher pressure on propensities to vote with respect to discussants who are just friends or acquaintances, because of their capacity to alter perceptions and actions toward the context. This has a very precise empirical consequence. In the case of a relative discussant, the effect of the discussant should not be affected by the distribution of the party in the broader context, while the tradeoff effect seen in Model 2 should be relevant among those who present a non-relative as a discussant. To test the hypothesis, Model 3 is fitted. The model is equivalent to Model 2, but, differently from this latter, is fitted with a three-way interaction: this serves to assess whether the interaction that was fitted in Model 2 is valid for non-relative discussants and is non-significant for relatives. To interpret the three-way interactions, predictions of

Model 3 for relatives and non-relative discussants are exposed in Figure 3.2 in left and right panel respectively. As it is possible to see, we can see a multiplicative effect only in the model that considers the non-relatives: the marginal effect for a respondent who is exposed to a non-relative who votes the generic “locally strong” party – a party which strength is around 40% – is around 2, significantly lower with respect to the situation in which the party is around 10%. The left panel shows the predicted scores relative discussant. The interaction results not significant: as it is possible to see in the plot, there is not any clear multiplicative pattern.

### 3.5. Discussion

This chapter aimed to investigate the relationship between contextual effects and the network environment, focusing primarily on the geographical context. Results are, after all, consistent with the theoretical framework exposed in Chapter 1. First, the relational exposure, which has been operationalized as the exposure to the main discussant, demonstrated to present robust positive coefficients on the propensity to vote for a party. At the same time, the strength of the generic party (De Sio Franklin 2011) on the territory, that is, its geographical result in 2013 elections, correlates positively with the individual level of acceptance of the generic party. Of course, the simple presence of an effect of the geographical context cannot demonstrate, per se, that the context actually leads to an influence effect because of the so-called sampling bias (Baybeck McClurg 2006): an increasing number of party A’s supporters in a municipality, makes it easier to select in the sampling procedure people who have higher  $ptv$ ’s for party A.

Model 2 shows that a tradeoff effect between the two sources of environmental influence is present in Italy (see Mancosu 2016). As long as one party becomes stronger, as long as the effect of the network, represented, in this case, by the main discussant, diminishes. Moreover, consistent with our theory the idea that different ties lead to different out-

comes is successfully corroborated. Model 3 of table 3.1 shows that the effect of the discussant's vote choice on the propensity to vote does not change with the prevalence of the party in the broader context; the general climate has thus few chances to influence the relative discussant's marginal effect, consistent with the explanation that sees the family as a bubble in which individual electoral behavior is coerced. On the other side, the tradeoff effect is present among those exposed to a non-relative discussant.

Consistent with our hypothesis, it seems that the exposure to network represents some sort of "filter" (Huckfeldt Sprague 1987) that alter people's chances to perceive and being eventually affected by new ideas present in the local context. Moreover, it is worth to remember that the effect that members of cohesive social groups exert on the individual was assumed to be stronger compared to people who belong outside the boundaries of cohesive social groups (Huckfeldt et al. 1995). Results, thus, seem to be consistent with our expectations and with the theoretical framework presented.

Analyses presented in this chapter present, however, several limitations. The first, and most important, is the fact that evidence about the relation between individual opinions, networks that surround them and local geographical contexts are solely cross-sectional. In other words, and contrarily to what seen in chapter 2, we have weak evidence concerning the fact that correlations emerging from our analyses can actually be interpreted as influence mechanisms. As stated in the literature (Rogowski Sinclair 2012, Mollenhorst Volker Flap 2008, Mancosu 2017), indeed, simple cross-sectional correlations could be the result of several alternative processes, not directly related to influence. Although we have seen above that the process of selection is not engaged by a large part of the electoral body, it is still possible that the relationship between respondent ptv and discussant's vote choice is partly caused by a homophily process (namely, a process in which respondent seeks for relations with a certain party supporter and is not influenced by him/her).

However, it must be stated that the ambiguity concerning the nature of network pressure coefficient does not affect the kernel of our argument, that is, the relationship between the network and different social circles and context. As stated above, the framework we have developed previously stress that exposure to one circle would lead to theoretically explainable regularities, as in the case of the tradeoff expectation. With respect to this argument, thus, the ambiguity of the mechanism that is behind main discussant's coefficient represents, all things considered, a minor limit with respect to the core of our argument.

With regard to our broader theoretical framework, we can say that in this chapter it has been hypothesized a particular type of relation between networks and contexts. It has been stated that networks act as a filter to the external world, given two characteristics of the networks specified in chapter 1, coercion and sensitivity to the broader context. As Erisen and Erisen (2012, but see also Mancosu 2016) point out, familiar ties represent some sort of "social bubble" in which individuals have more distorted cognitions and preferences compared to external stimuli; people, thus, react to these distortions by boosting or depressing viabilities for parties, according to opinions of their network and to parties prevalence in the context. These expectations turned out to be consistent with the data.

The next chapter will focus again on these multiple characteristics of different social networks, stressing how different circles' coercion and sensitivity can lead to very different outcomes, according to characteristics of the political supply. Moreover, after having focused on geographical context, it will be depicted the relation between temporal context, networks, and individuals, by employing an interesting case study that occurred in 2013 National Elections: the rise of Movimento 5 Stelle during the electoral campaign.



## Time as a context

The 2013 election campaign and the rise  
of the Movimento 5 Stelle

### 4.1. Introduction

In the previous chapter, an example of the relationship between context and network in conditioning electoral behavior has been shown. The main characteristic that context presents in our theoretical framework is that, as Huckfeldt (1986) and, previously, Blau (1977) have pointed out, the former contributes to shaping the opportunities that individuals have in engaging in political discussion. The idea of context is usually identified with that of geographical context. As a result, the network – the complex set of different dyadic interactions that individuals experience in their everyday lives – has been argued to be affected by the general prevalence of specific characteristics in the larger spatial environment (Blau 1977, Blau Schwartz 1984, Blau 1994, Huckfeldt Sprague 1987).

We must remember that the framework presented in chapter 1, however, does not only refer to context intended as the distribution of party supporters in the local geographical environment. The idea that only space can be thought as a context clashes against the theoretical argument which explicitly allows the possibility of thinking about another form of contextual influence. The structure, according to Blau, is characterized by the distribution of individual characteristics in a particular environment. Changes in the distribution of preferences or characteristics, as it has been argued in many sociological works, vary on a geographical, but also on a temporal dimension (Rogers 1983, Granovetter 1973, Blau 1987, Blau 1994, Vezzoni Man-

cosu 2016): the increase (or decrease) over time of specific characteristics in the population leads individuals to be in a context that is differently distributed, compared to the previous days, months or years. This alteration, in turn, affects the network in which the individual is embedded.

The chapter that follows will interpret and expand this general theoretical argument, combining it with some of the tools that sociological theory gives us in these situations. The case study taken into account, in order to assess the effect of network and temporal context, will be focused on the most interesting surprise of the 2013 Italian National Elections, the important result Movimento 5 Stelle, a party led by a former comedian, Beppe Grillo (Diamanti 2014), which, in less than two months (according to the data that have been collected during the election campaign) raised from 17% to 25%, gaining about the 30% of the strength it had initially. The Movimento, presenting itself during the crisis of representation that invested Italy and the EU at the beginning of the '2010s (Diamanti 2014), has revealed to be incredibly charming for the electorate. Movimento's 2013 election campaign has been based on popular and captivating arguments, such as the institution of a basic income for the unemployed and the clampdown on corruption in the public administration. Next to the electoral manifesto, the image of the Movimento was promoted also by means of the MPs selection process: in order to signal a distance between the Movimento and the old political parties, a troop of young citizens, who had never experienced militancy in traditional parties, has been selected by means of a web-based contest. Beppe Grillo's media and political strategies, taken together, led analysts to borrow Taggart's (1995) classification in defining the Movimento as a populist (or neopopulist) party (Corbetta Gualmini 2013, Biorcio Natale 2013, Diamanti 2014).

The chapter, however, more than focusing on "why" the Movimento's arguments were so charming, aims at arguing "how" those arguments spread into the electoral body. The mechanism that we hypothesize here deals with the relationship

between the context – that is, the prevalence in the environment, in different periods in time, of people who voted for the Movimento 5 Stelle – and network – that is, the social space in which the set of mechanisms that contributed to convert people have been enacted. These two theoretical objects will be integrated and explained by means of the general framework of the so-called “strength of weak ties” (Granovetter 1973, 1983) in combination with the theory of the threshold diffusion processes (Granovetter Soong 1983, Valente 1996, Cacioppo Fowler Christakis 2009, Christakis Fowler 2012): the main idea, indeed, is that the rise of the Movimento can be interpreted as a diffusion process fueled by the exposure to the so-called “weak ties”. This argument is not new in the literature: previous studies (Vezzoni Mancosu 2016) showed that the increase of Movimento’s support can be approximated to a diffusion process, particularly fostered by the exposure to weak ties. The empirical evidence provided, however, is only indirect and does not give us the “smoking gun” of the set of influence processes among peers that a diffusion of innovation process leads to. This chapter aims, by means of a computer simulation calibrated on real data (namely, an Agent-based model – ABM), to test the diffusion hypothesis in the 2013 campaign. With the data available, indeed, a computer simulation represents the best choice to test mechanisms of interpersonal communication and influence systematically.

#### **4.2. Diffusion of innovations, the threshold model and the role of weak ties**

Intuitively, a process of diffusion can be defined as a social process that results in a progressively higher prevalence of a behavior or an opinion in a social system (Rogers 1983). Following Rogers’s framework, the innovation can be represented by a large number of behaviors, physical objects or opinions: a technology (Coleman Katz Menzel 1957, Coleman Katz Menzel 1966), attitudes toward certain behaviors (Nazio Blossfeld

2003, Guetto et al. 2016), voting behaviors or political ideas (Lutz in Eagles 1995; Vezzoni and Mancosu 2016, Braha de Aguiar 2017). In the theoretical framework, the role of interpersonal influence is crucial: people are convinced to adopt the innovation mainly by means of interactions with other people, who already adopted it. It is thus easy to imagine that the temporal context and the networks in which individuals are embedded are strictly interdependent. If we would like to translate Rogers's concept into the lexicon introduced in chapter 1, we would say that, given an individual embedded in a network, a diffusion of an innovation is a process that leads the individual, in different periods (temporal contexts), to be exposed to an increasingly larger prevalence of discussants who are adopters of that innovation among her ego network, contributing in this way to enhance the likelihood to adopt it.

At the level of individual and social mechanism, the diffusion over time of the deviant/original behaviors can be well depicted by the so-called threshold model (Granovetter Soong 1983, Macy 1991, Valente 1996). Generally speaking, the threshold model states that, before adopting a deviant/innovative behavior, people tend to evaluate how many other people of their social network are engaging in that behavior. People can differ between low-threshold and high-threshold – that is, people who are exogenously more subject to embrace the deviant opinion and people who are not. In presenting an example related to the diffusion of the participation to a riot, Granovetter states: «[c]onservatives will have high thresholds: the benefits of rioting are small or negative to them and the consequences of arrest high since they are likely to be “respectable citizens” rather than “known rabble-rousers.” Thresholds of 80% or 90% may be common, and we may allow for those individuals who would not join under any circumstances by assigning them a threshold of 100%» (Granovetter Soong 1983). From the other side, people who are exogenously more prone to join the riot will need, say, a 5-10% of their social network that joins the riot to embrace the uprising.

The main idea behind this chapter is that the diffusion processes in which multiple social circles are involved should be combined with the theory of strong/weak ties exposed in chapter 1 and 2. The main consequence of the strength of ties that cohesive social groups present is the fact that people embedded in those groups present lower sensitivity of the broader context – the general climate of public opinion, and higher levels of coercion: strong ties have been theorized to act as a tool of political normalization and coercion toward their members. Conversely, non-cohesive social groups are composed primarily of weak ties, and the structure of these networks is more open to being affected by a more substantial amount of people (Granovetter 1973, Huckfeldt et al. 1995). This leads the individual to be more aware of the public opinion climate: «[w]hen social communication occurs through weak ties, beyond the boundaries of cohesive social groups, public opinion becomes more fully public» (Huckfeldt et al. 1995). As a result, non-cohesive social groups, given the structural characteristics of the weak ties composing them, represent the channel through which an individual can be exposed to the general climate of opinion.

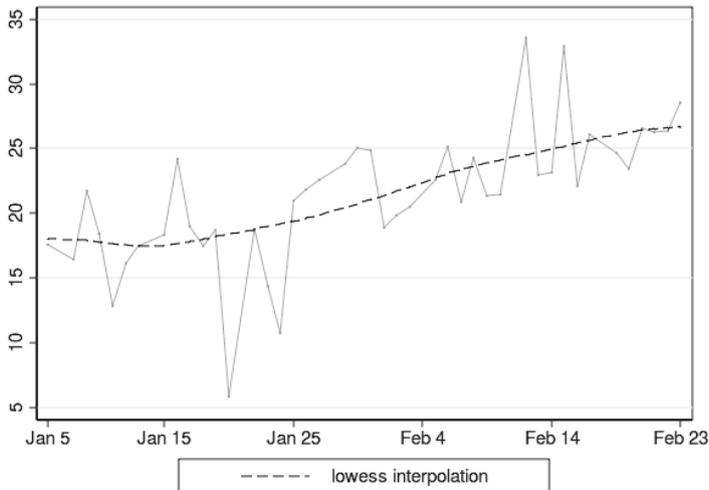
Of course, exposure does not lead automatically to a conversion to the innovation: individual propensity to embrace the innovation, which can be converted in a threshold in Granovetter's sense, contributes to shaping the likelihood of embracing or, rather, rejecting the innovative behavior or attitude. As long as the environment changes and the diffusion unfolds, however, as long as people are exposed to a higher number of discussants who have switched to the innovative option, more of them are exposed to the new idea and, eventually, can be converted to it. It is important to underline that the process involves individuals and the environment in which they are embedded endogenously.

The next sub-paragraph will deal, more in detail, with the combination of diffusion processes and weak ties frameworks, exploring the case study to which these mechanisms will be applied, namely, the rise of the Movimento 5 Stelle during the 2013 election campaign.

#### 4.2.1. *The Movimento's rise: a diffusion process fueled by weak ties?*

In Figure 4.1 it is shown the rise, in term of voting intentions, of the Movimento during the campaign, based on RCS ITANES data (see below). If, at the beginning of data collection (January 6), the percentage of potential voters of the Movimento is about 17-18%, the day before the Election Day (February, 23), the percentage of people who declare their vote for the Movimento is above 25% (a substantially correct prediction of the actual electoral outcomes). In particular, the S-shaped form of the trend resembles the form that many diffusion processes share. Seminal works on the topic (see Rogers, 1983), as well as more recent ones (Fisher Hout 2005), identify an S-shaped curve as the result of a process of diffusion activated by means of personal/impersonal communication.

The literature that tried to account for Movimento's 2013 exploit, instead of focusing on discussion networks, employed two main explanatory arguments: several scholars (Biorcio Natale 2013, Nizzoli 2014, Diamanti 2014, Biorcio 2014) argued that Grillo's media-related strategy was one of the keys



**Figure 4.1.** The rise of the Movimento 5 Stelle during the election campaign (Source: ITANES 2013 RCS survey, lowess bw=0.8).

of the Movimento's success: Beppe Grillo, «has succeeded, indeed, in being visible and making news even without being directly present. He has 'compelled' news broadcasters and talk-show hosts to deal with him, to download his video messages and retransmit them. Grillo, in fact, exploits television to his own advantage, pushing the lever of communication to 'full on' when an election is in sight» (Diamanti 2014).

According to other scholars, the revolutionary employment of the Movimento of new technologies, such as online social networks and the internet in general, could have been crucial to the success of the party: the Internet, in this explanation, becomes a sort of substitute for real interactions (Bentivegna 2014) and the diffusion process is enacted by means of virtual interactions instead of real-life ones (Chadwick 2009): in this case, just part of the social circles, the virtual and the real one, would overlap, while the rest of the diffusion effect could be given to online interactions with people who are not physically in touch.

Although these two alternative frameworks clearly represent an interesting set of explanation of the impressive and fast rise of the Movimento, we will focus on another explanation, more connected to the topic of the work, which employs the interpersonal communication framework. As stated above, previous literature had already investigated the positive trend of the Movimento's campaign, by concluding that the mechanism underlying this empirical evidence could be connected to a process diffusion fostered by weak ties (Vez-zoni Mancosu 2016). However, the studies limited to an indirect test of the mechanisms, by showing that people, during the campaign, tended to vote more for the Movimento when exposed to non-relative discussants and that this effect was larger nearer the election day. In this chapter, we will test the mechanism by employing ABM, a technique that allows us to formulate more precise hypotheses on the mechanisms that produced this rapid increase.

#### 4.2.2. Hypotheses

Summing up, the situation hypothesized in this work starts from different standpoints: first, what we are hypothesizing here is a grassroots trend, which emerges from interpersonal relations. The first hypothesis will read thus as follows:

*Hp1. the Movimento 5 Stelle vote intentions rose, during the election campaign, like a diffusion of innovation process.*

Second, families are social circles that present lower levels of sensitivity, and higher levels of coercion are those groups in which new, deviant opinions tend to be contrasted (Berelson Lazarsfeld McPhee 1957, Huckfeldt et al. 1995). On the contrary, non-cohesive social groups, characterized by a higher likelihood of weak ties relation among their members, allow people to be more embedded in the public opinion, making them more aware of political novelties and thus making the likelihood to adopt these novelties higher. The first hypothesis will thus be based on this argument, reading as follows:

*Hp2. The diffusion process is fostered by non-cohesive social groups.*

Moreover, it must be stated that exposure to weak ties does not lead automatically to higher likelihood to vote for the Movimento, that is to say, not all voters were convinced in the same way by Movimento's claims and promises. We can hypothesize that a specific section of the electorate, during the campaign, could have been very skeptical toward the characters of Movimento's claims or the party manifesto. Another part of the citizenry, rather, could have been exogenously more enthusiast toward the Movimento and its general characters, demonstrating, almost immediately, trust in the whole political operation. Others, again, could have been only partially skeptical of some claims. Thus, the third hypothesis will read as follows:

*Hp3. People possess higher or lower thresholds that can make easier or more difficult the conversion to the Movimento, irrespective from the exposure to converted discussants.*

The next paragraph will deal with these interpretations of the process, providing results based on ABM simulations.

### 4.3. Data, measures, and models

The hypothesized processes presented above will be tested by means of a computer simulation (an ABM) that needs, to be efficiently calibrated, reliable deal data of the phenomenon. In this chapter, we will use data coming from ITANES 2013 Election Study. In particular, the 2013 pre-electoral Rolling Cross-Section (RCS) survey (Johnston Brady 2002) will be employed. ITANES 2013 RCS spans for a 50-days time, from January 5 to February 23 (the day before the elections). For every day of the time span, a quota sample of 200 respondents was collected by means of CAWI (Computer Assisted Web Interview) mode. The total of the sample is of 8,722 cases, distributed over 43 days (on Sundays data were not collected). In this way, we can have a daily snapshot of the diffusion process of the Movimento in the social environment<sup>1</sup>.

The diffusion process of the Movimento 5 Stelle is strictly related to the vote intention that respondents have declared during the campaign. The choice of one of the primary variables employed has dropped on a simple binary vote choice, where 1 is a declaration of vote for Movimento 5 Stelle and 0 equals “anything else” (which represents other parties and includes people who are not yet sure which party voting for). Exposure to strong/weak ties, our second, main variable, deserves some

<sup>1</sup> As for chapters 2 and 3, descriptive statistics for the variables treated in this chapter are available in the Online appendix of this book, and can be found at [morenomancosu.github.io](http://morenomancosu.github.io)

further attention. As explained above, what are we looking for here is a measure of exposure to different social circles instead of discussants. When facing such an issue, standard name generator procedures (like those employed in chapter 2 and 3, Huckfeldt et al. 1995, Huckfeldt 2001, Klofstad McClurg Rolfe 2009) become less useful: indeed, by means of name generators, non-cohesive groups information could be systematically under-reported, being people who compose these groups, by definition, individually less “important” compared to those who belong to cohesive groups (Huckfeldt et al. 1995, Baldassarri 2009).

The two questions that have been asked in 2013 ITANES survey – which subsequent analyses are based on – are a variant of those presented by Baldassarri<sup>2</sup> and read as follows:

1. How many of the [members of your family/friends] do you think have your same political opinion?:

- a)* none of them (0%)
- b)* a few of them (around 10%)
- c)* some of them (around 25%)
- d)* about half of them (around 50%)
- e)* many of them (around 75%)
- f)* most of them (around 90%)
- g)* all of them (100%)

This measure allows us to assess whether voters are embedded in homogeneous or, rather, heterogeneous networks. In particular, questions are asked about the intimate circle (which is assumed to be the strong tied one) and the friend circle (which will be assumed to be characterized by weak ties).

<sup>2</sup> If the wording of the questions proposed by Baldassarri (2009) ask explicitly a rough percentage of how many people vote for a certain party/coalition respect to another one, in 2013 survey it has been decided to ask respondents an estimate of how many discussants have the same political opinions (see below for a more refined argument on the measure).

To fit the ABM, also, we need the exogenous measure of the individual threshold of people, measured with the propensity to vote for the Movimento (see chapter 3), and a variable that expresses the exogenous propensity of the individuals to talk about politics during the campaign (measured on a scale that goes from “Every day” to “almost never”).

#### 4.3.1. *ABMs: theory and applications in electoral studies*

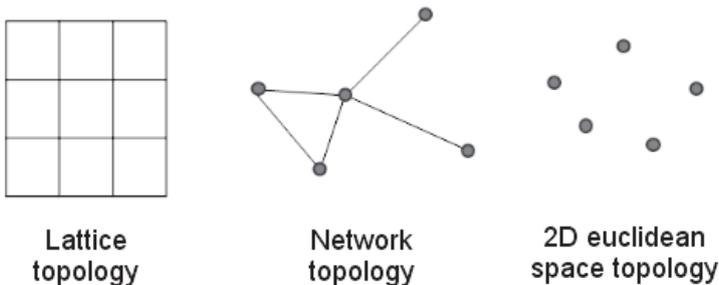
The main aim of performing an ABM is to understand the individual and relational mechanisms enacted in a specific social process and to assess whether these mechanisms hold, logically and empirically. The primary theoretical focus of ABMs is related to the fact that, having constructed a set of behavioral rules and relationships among agents, the aggregate result of the simulation is not straightforward, but, rather, patterns emerge from the interaction of these simply-ruled agents (Schelling 1971, Schelling 1998, Clark 1991; Axelrod 1997, Huckfeldt Johnson Sprague 2004, Zuckerman 2005).

The fundamental object in an ABM is the agent. The agent possesses behavioral rules (Jennings 2000; Macal North 2010, Gilbert Troitzsch 2005, Kohler Gummerman 2001), usually a more or less simple set of “if-else” connections, which guides agents’ actions. Agents possess also states that can change over time, usually by means of relations among agents (Macal North 2010, Gilbert Troitzsch 2005)

Simulated social mechanisms are different according to the type of relations that agents are embedded in, a characteristic of the model that is usually called topology (Macal North 2010), namely, the environment in which agents interact: a topology can be in the form of networks, lattices, like in cellular automata models, (Gaylord Nishidate 1994, Gilbert Troitzsch 2005), GIS maps or 2D/3D Euclidean spaces (see figure 4.2). It is important to underline that different topologies lead to different representations of the real underlying processes and, thus, to different assumptions on which the simulation is based. The following work employs a network topology, which can give

the researcher more freedom of choice about characteristics of the structure of the relationships. Agents, by means of network topologies, are linked to other agents and can share a higher or lower number of other agents, a thing that is not possible with a lattice structure. From a more technical point of view, an ABM is composed of two fundamental steps. The first one is usually called “initialization.” By means of this step, agents are created, characteristics and behavioral rules are implemented into them, and every adjustment is made to set up the environment. During the “running” phase, the simulation is actually started, agents can communicate among them and results are collected (Gilbert Troitzsch 2005, McKelvey 2002).

In general, electoral studies aiming to test their mechanisms with simulations (and, in particular with ABMs) have proven not to be particularly interested about the adherence of their model with real data (Axelrod 1997, Huckfeldt Johnson Sprague 2004). Simulations in electoral studies tend to be more focused on providing evidence about the logical consistency of one or more theory tenets on which the simulation is based, rather than a strictly empirical test of the mechanism. This chapter focuses on a single phenomenon and a single case study (the diffusion of the *Movimento* in 2013 election campaign). This focus allows us to push forward the possibilities of the ABM technique, by calibrating with ITANES real data our simulation and performing external validity tests in order to assess whether the mechanisms that we explicitly hypothesize lead to empirical results that are similar to the real-world electoral results (Lau-



**Figure 4.2.** Different types of topologies.

rent 2000, Bhavnani 2003, Mehta Bhattacharyya 2006, Liu 2011). In the following paragraphs, basic information about the initialization and the simulation of the election campaign will be provided.

#### 4.3.2. *Initializing and running the ABM*

As stressed above, the diffusion by means of weak ties hypothesized here is composed of several sub-processes, identifiable as follows:

- a) people who are exposed to weak ties are more exposed to the broader context opinions, given that information transmitted by means of weak ties can spread farther (Granovetter 1973). These various opinions lead, probabilistically, to be exposed to deviant opinion/behaviors, such as voting and supporting the Movimento 5 Stelle;
- b) exposure to Movimento's supporters could eventually lead to the conversion of people who are not yet convinced to vote for it;
- c) the likelihood of conversions is also function of individual thresholds (Granovetter Soong 1983), that is, the propensity that the individual will be converted is based upon an exogenous propensity to consider the party as a viable option;
- d) once converted, the individual serves as the environment for someone else and can be part of her environment during the process of conversion;
- e) if the process is a diffusion, points a-d become a cycle of a chain reaction that involves a growing number of people.

The process of initialization is a somewhat complicated procedure, and in particular, the aim of making the procedure externally valid leads to complex brute-force approaches that

would lead the reader to be distracted from the empirical results and the substantive relevance of the chapter. For this reason, it has been decided to place this more technical procedure in Appendix. The non-expert reader is only required to know that the definition of initial values is derived from the first seven days of data collection of the ITANES RCS data. At time 1, every one of the 1,000 simulated agents possesses a real-data derived measure of the exogenous propensity to vote for the Movimiento and the actual potential behavior of every individual (whether she is going to vote or not for the Movimiento). A generic propensity to talk about politics, extracted from the data (and not substantively correlated with the other variables) is assigned to every agent. Also, every agent has a certain percentage of “friends” and “relatives” who are in agreement with it, a piece of information derived from the family/friends homogeneity variables presented above. The measure of who is “relative” and who is “friend” is derived from the actual network topology that connects the agents, being the strength of the ties based on how many other nodes in common share two agents (this is consistent with the idea of strong/weak tie exposed in the literature—see Granovetter 1973).

Once produced a network that satisfies the request of similarity with the real data, it is possible to start the simulation. First, the algorithm, starting from a random node, assesses if this reference node is available to “discuss” (the higher is the data-driven propensity to talk of the node, the higher would be the probability for the node to start seeking a discussant, see figure 4.3). If the reference node is available, it seeks for a “discussant node,” extracting it among its neighbors, namely, the nodes to which the reference node is connected. If the two nodes are in agreement (that is, if they have the same voting behavior toward the Movimiento), the iteration switches to another reference node and nothing changes in both nodes’ characteristics. If the two nodes disagree, the “convincing attempt” subroutine starts. Imagine that reference node, say, Node A, has a vote choice equal to 1, while the discussant node, say Node B, has a vote choice equal to 0 and a Ptv variable equal to 6. The

software draws from a uniform distribution (with 0-10 range) a random number. If the number is lower than the discussant ptv (say, the random number drawn is 4.5), this latter discussant is “convinced.” Its vote choice variable becomes thus 1, and its ptv is drawn from the distribution of ptv of those who voted for the Movimento 5 Stelle in the simulated environment. In this way, we have a simple and effective way to measure the probability that a node has to be “convinced” by another node, according to this former’s ptv. No changes are made on the network that this “discussant node” has (the network is assumed stable during the campaign) The procedure is performed for all the nodes in the sample and repeat itself for 41 “days” (the number of days of campaign if we erase the first week that was used to initialize the simulation).

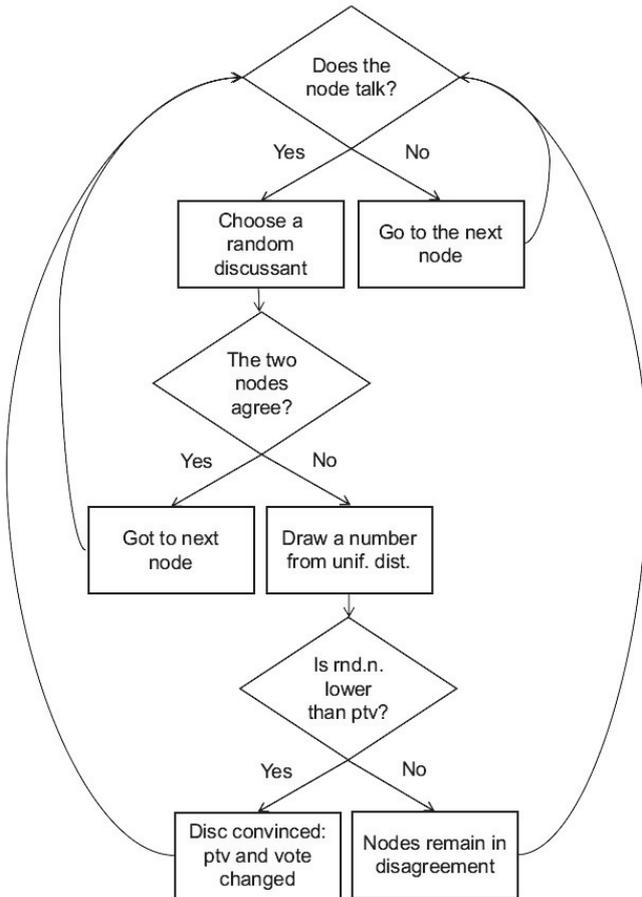
It is crucial to underline three main characteristics of this procedure: first, it is also applied when the convincing node is not a supporter of Movimento 5 Stelle. This is consistent with the fact that people can also be convinced not to vote for the Movimento during the campaign. The diffusion process, as we will see below, is just a process in which people convinced toward the Movimento are more than those who are convinced against the Movimento (most important, this increase emerges naturally from the real-data inserted)

Second, the simulation assumes that the propensity to vote, a data-driven individual characteristic, can be employed as a measure of the threshold. In this way, by means of the propensity to vote, it is possible to measure the exogenous, individual likelihood to be affected by others during the simulation.

Third, the procedure of construction of an ABM forces the researcher to state the mechanism of influence explicitly. According to Granovetter’s framework, the threshold of a person, combined with the exposure to deviant opinion holders, determines almost automatically the conversion of a node (see Granovetter Soong 1983, Mancosu 2017). The simulation presented here does not assume this automatic switch. The node remains coherent with its opinion until it does not find a discussant that, tries to “convince” it.

### 4.4. Results

The ABM initialization has been performed using the first week of the RCS data. However, data for the rest of the campaign is available. This availability of information that is subsequent to the data employed in calibrating the ABM can be used as a test of the ABM’s external validity. If the mechanism that we hypothesized holds, the aggregate patterns of the Movimento’s

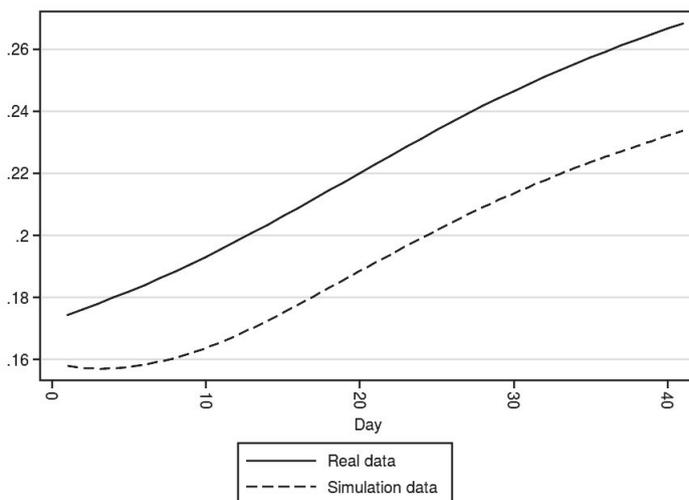


**Figure 4.3.** The flow chart of the conversion process.

simulated increase should be, if not equal, at least similar to the real outcomes. In figure 4.4 are presented two curves, both showing the proportion of Movimento's voters in the system: the solid one is a lowess interpolation of the trend of the real RCS data (bandwidth=0.8) during the remaining days of election campaign (41 days, from January 13 to February 23). The dashed line is a connected line that represents, for every day of campaign, the proportion of Movimento's voters in the simulated system (the line represents an average of 25 simulated campaigns). The correlation between the two lines is .96. As is it possible to see in the figure the trends show small differences. The first difference is that related to the "intercept". Simulated data tend to present, in general, lower levels of support for the Movimento. Moreover, there is a small difference in the slope, that is, simulated data presents a slightly smaller rise than the real one. Anyway, the simulated data, given also the high correlation between the two curves, seems to fit quite well the real trend and this is truer if we think that real data and the simulated trend are based on entirely different (and technically unrelated) data. If the rules of the simulation would have been meaningless, our outcome should have been a trendless fluctuation of our aggregate results and a substantially flat line of reproduced data. figure 4.4, conversely, shows us that aggregate simulated data present a surprising similarity with real data: this gives us substantial evidence that the simulation reproduces in quite a convincing way the process we are investigating.

After having assessed the goodness-of-fit of the simulation compared to the real data, it is necessary to provide evidences for the mechanisms hypothesized in the work. First, we test whether the simulated data can comfort us about the individual mechanism we hypothesized, that is, the fact that the process is actually a threshold-like one. Since we have designed the ABM by assuming that no other elements (such as the media) could influence the process of diffusion of the M5s, we can say that the correlation between simulated and real data provides robust evidence to the diffusion process argument (Hp1).

We have hypothesized that the process of diffusion is a threshold-like one (Hp2). In figure 4.5 we see an indirect, but strong proof of this mechanism: the average values of initial ptv's of converted toward the Movimento and against it. The ptv, here, can be seen as the complement of the individual threshold. If ego has a high propensity to vote for a certain party, it would have a low threshold, that is, higher exogenous propensities of being converted to the Movimento. Contrarily, if the ptv is low, that means that it is more difficult to convert ego, and, thus, the threshold is high. For every simulated day, thus, it is calculated the average individual ptv – at the beginning of the simulation – of those nodes that have been converted toward the Movimento and against it. In the left panel are plotted the average ptv's of the converted toward the Movimento. As it is possible to see, the propensity to vote of the converted, at the beginning of the simulated campaign, is higher. In other words, the first nodes to be converted are those that are “easier” to be converted. As long as the campaign accelerates, however, as long as the average ptv of the converted lowers. At the end of the campaign, on average, nodes that have a 50-50 propensity to vote the Movimento are converted.



**Figure 4.4.** Aggregate results: simulation and real data.

**Table 4.1.** Number of “Friends” and mean of “Friends” conversions toward and against the Movimento.

Conversions to M5s			Conversions to Other parties		
Number of friends	Mean of Friends-led conversions	N	Number of friends	Mean of Friends-led conversions	N
8	0,67	0.4	8	0,50	0.2
9	0,35	1.7	9	0,50	1
10	0,52	162.0	10	0,51	128.0
11	0,54	125.0	11	0,54	99.8
12	0,58	71.1	12	0,58	58.6
13	0,66	22.1	13	0,62	15.6
14	0,72	7.8	14	0,66	5.8
15	0,75	1.4	15	0,69	1.2
Total	0,55	391.5	Total	0,54	310.2

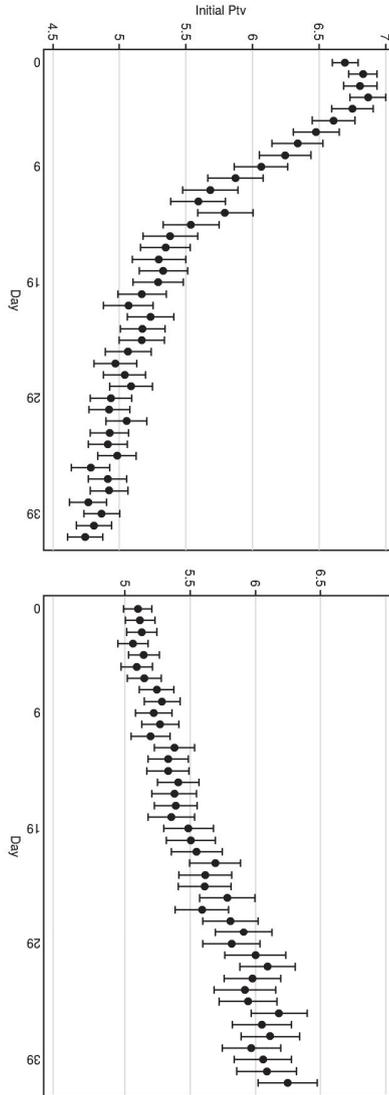
The situation of the right panel is the opposite: at the beginning of the simulation, nodes that reported to vote for the Movimento but had a ptv which was not too high were easily converted not to vote for the Movimento (the average of the ptv is around 5). At the end of the campaign, the level of those who have been converted against Movimento is higher, but the confidence intervals are bigger (indirect evidence of a smaller number of conversions against the party).

Summarizing, it is important to stress again how this ABM shows a mechanism related to the threshold model that usually is underdeveloped: in this ABM there is no automatic routine that, given a particular threshold and a certain number of converted neighbors, leads to an immediate conversion. The idea behind the ABM mechanism is that being surrounded by a certain number of converted neighbors leads an individual to be exposed to more inputs that push the same to be converted. Instead of being automatic, the process is *probabilistic*. The left panel shows that the diffusion process is similar to what we have hypothesized, namely, a process in which, consistently with the threshold model, people who are more enthusiasts of

the innovation are the first to join it; after this first phase, also part of those who were undecided at the beginning of the process are converted, because of the modified structure of the context of opportunities in which they are embedded. The simulation shows us another original element, usually underdeveloped in the literature: a diffusion process is not a plain and simple rise of the proportion of an innovation over time. There are forces trying to challenge this process, in this case, convincing their discussants to change their option and to return, to some extent, to traditional choices. A diffusion process, according to the results that emerge from the simulation is, in part, a victorious struggle against these “conservative” forces, instead of a simple increase of a proportion in a social system.

Hypothesis 3 is related to the weak/strong ties difference. In table 4.1 is presented evidence for this hypothesis. The first column presents the number of friends (see Appendix) that a node can have, the second presents the proportion of conversion caused by friends, the third the average number of conversions for the 41-days simulations during the 25 simulated campaigns. As it is possible to see, as long as the number of friends rises, as long as the proportion of conversions caused by friends rises too, and the same does the raw number of conversions. The number of friends, given the structure of the circle, also contributes to convert people to other parties (columns 4-6 of table 4.1), but in a weaker way with respect to the conversion toward the Movimento. This is strong evidence that friends are the primary channel by which the new information is transmitted and, at the end of the process, more people are converted. Additional evidence is shown in figure 4.6: the top panel shows trends for conversions toward the Movimento caused by friends, conversions against the Movimento caused by friends, toward the Movimento caused by relatives and against the Movimento caused by relatives.

Every conversion type is divided by the total of conversions per day, and the lines are represented by a lowess interpolation (bandwidth 0.8). An element of interest is that friends' conver-



**Figure 4.5.** Average initial pvt's of converted to M5S (left panel) and against it (right panel) by day.

sions (toward and against the Movimento) are the majority of all conversions, while family conversions are systematically lower.

It is important to stress that “friends” are also a tool of political change also toward other, non-innovative, parties. This could be intended as a disconfirmation of our theory. However, it is important to stress that, according to our theoretical model, weak ties are the realm of debatable opinion, and the diffusion process of the Movimento can be seen as a simple by-product of this “structural” characteristic of these relations. From the other side, family is the social space in which stability is the normal situation and, thus, as expected, is less important in converting our agents, toward and against the Movimento.

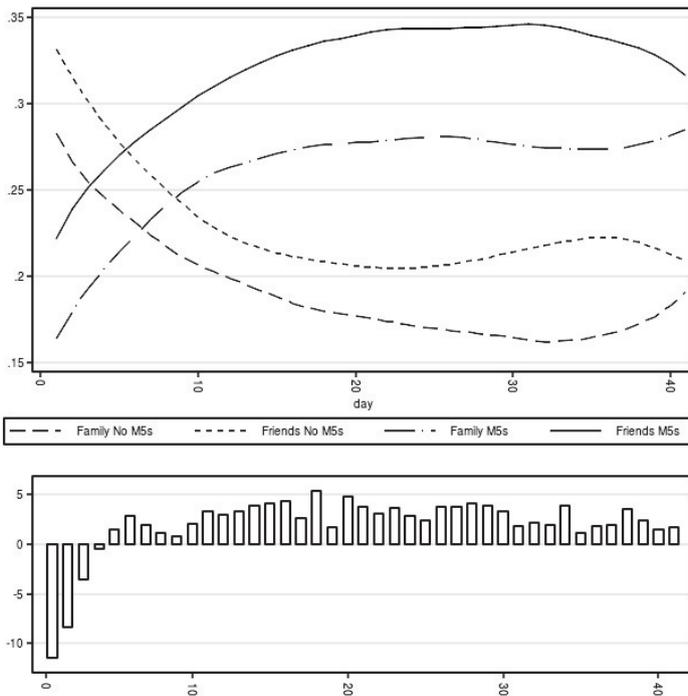
It seems that the difference between these two types of influence decreases at the end of the campaign. This could be related to the fact that the diffusion’s “fuel” (that is, people with relatively high *ptv*’s who are not yet converted) is running out, and then the basic mechanism that we hypothesized, the diffusion through weak ties, is weakened.

The relative difference between friends- and relatives-driven conversions is showed in the lower panel of figure 4.6 gives, more or less, the same insights about the simulation. The figures in the graph are calculated by subtracting the number of conversions caused by friends minus those caused by relatives. Positive figures represent, thus, that friends tend to convert more than relatives and vice versa. As it is possible to see, after the first 4 simulated days of campaign, the advantage of friends in making nodes “changing their mind” is strongest in the middle of the campaign and tends to slightly decrease at the end of it (compatible with the hypothesis that agents prone to be converted are fewer).

## 4.5. Discussion

The fundamental aim of this chapter was to test theoretical expectations deepened in chapter 1.

Three main ideas have been sustained there. First, it has been stressed that contexts provide the structure of opportunities in which one can be exposed to networks that present specific characteristics. Second, that, instead of being only geographical (as in many electoral behavior studies), the conceptualization of context can also be temporal. Time, thus, can represent, as well as space, the frame in which different networks characteristics are shaped. Third, it has been stressed that individual exposure to different networks – which possess different levels of cohesiveness – leads to predictable and non-trivial



**Figure 4.6.** Source, direction and number of conversions in the ABM.

outcomes. In order to investigate the relationship between individuals, their networks and the temporal context, a particular case has been chosen: the rise of the Movimento 5 Stelle in 2013 elections. As seen in Chapter 2 and 3, the Movimento's rise happens in a situation of huge political and economic turmoil (we have implicitly hypothesized that without this instability several elements could have changed the scenario): at that moment, thus, the Movimento represents a charming and unorthodox vote choice.

From a more strictly theoretical point of view, the rise of the Movimento during the campaign presents several important characteristics that allowed performing non-trivial tests of the theory exposed in chapter 1. First of all, the case of the Movimento represents a vast variation in a short time (7 percentage points, almost the 30% of the final national strength, in less than two months). The fact that the variation is so rapid allows us to test the relation between context and networks keeping constant what we called the constraints sets, and, thus, assuming institutional characteristics as fixed.

As stressed above, the capacity of time in shaping encounters among people leads to different outcomes depending on the prevalence of different characteristics in the population and the intimacy of the relations themselves. It has been shown in chapter 1 that different levels of intimacy present, in general, different levels of awareness of the context and, thus, different propensities to be indirectly affected by it (Huckfeldt et al. 1995). Intimate relationships, especially with homogeneous networks, imply higher levels of cohesiveness, while, on the other side, it has been stressed that being exposed to non-cohesive social circles makes individuals more aware of, and prone to be convinced by, the public opinion climate. Moreover, individual exogenous propensities can shape likelihood of being converted to the new, unorthodox alternative. This set of theoretical expectations has been linked to more robust and largely-debated theoretical frameworks: the "strength of weak ties" and the "threshold model of diffusion" theories. Although these two frameworks are related, a few research on these two theories as part

of one, more general framework, have been performed (Vez-zoni Mancosu 2016). In order to test these expectations, it has been argued that classic statistical models are not able to tackle the complexity of such a process. Thus, agent-based modeling has been employed as a testing strategy. The attempt of this work is, thus, twofold. From one side, the chapter has the aim of combining these two theories, finding evidence about the fact that innovative behaviors can be diffused by means of weak ties and threshold-like processes. At the same time, the chapter provides an effort that is extremely rare in the study of electoral behavior: providing direct proof of a social mechanism related to specific electoral behaviors by means of a real-data based computer simulation.

Results comfort our hypotheses. As pointed out by the ABM, the rise of the Movimento 5 Stelle in the 2013 election campaign is consistent with the social mechanisms depicted above. The diffusion process, as expected, is mediated by the role of exogenous individuals' propensities to vote (their thresholds) and, at the same time, is fueled by the exposure to weak ties. It has been shown, also, that the computer simulation fits surprisingly well the real data, especially if we consider that the two curves in figure 4.4 are generated with unrelated information (although the simulation is based on the first week of data collection): the difference between the simulated curve in figure 4.4 and the real one is never over 3 percentage points, and the shape of the increase is almost identical.

How are these results consistent with the general framework exposed in chapter 1? The very concept of diffusion, first of all, can be considered as a special case of the relationship between temporal context and networks: as long as the prevalence of the behavior in the system increases over time (context), it is more likely for the reference individual to be surrounded and exposed by supporters of the innovative option and to change opinion. Once the reference individual has changed her mind, compatible with her threshold, she can serve as part of the environment for other individuals. Moreover, she contributes to increasing the proportion of people who support that innovative opinion at

the systemic (read: contextual) level. Moreover, it has been demonstrated that the role of weak ties is crucial to this diffusion process: relations enacted in less cohesive groups allow individuals to be exposed to, and to embrace, less conservative options, making them more prone to consider their electoral change as an option. In this way, less cohesive groups fuel the chain reaction.

Results presented in this chapter, however, have some limitations: the first is related to the fact that, although time is expected to be the main context of influence in this case, also space (namely, geographical context) can have influenced the mechanism presented above. If we think about context as the changing proportion of people carrying specific characteristics (in this case, support of the Movimento), we could expect a differential of support in different places of the country – this is even more likely if we analyze the scattered geographical distribution of the Movimento in 2013 elections. Unfortunately, testing this combined relation between two contexts and ego networks would have needed a larger amount of data, which is not available.

Second, we can imagine a different explanation of our results: stating that non-cohesive groups can boost the likelihood to vote for the Movimento means assuming that a single property of these groups, cohesiveness, can influence people's behavior. Actually, it is easy to imagine that non-cohesive and cohesive groups present considerable differences in several other dimensions: it can be that refractoriness of cohesive social groups toward the new political alternative is due to demographic determinants, such as the fact that familiars are usually older than friends, and thus less prone to evaluate positively different anti-system, new political alternatives. This concern can be partly taken away by ABM results, which implicitly assume that cohesiveness (and homogeneity) is the only difference between cohesive and non-cohesive groups: as pointed out above, the simulation present results highly compatible with real data.

## Discussion and conclusion

The aims of this work have been various: the main aim was to construct a theoretical framework able to collect arguments coming from different scientific traditions (sociology, geography, and political science), providing a general set of theoretical arguments that systematizes the effect of the environment on voting attitudes and behavior, as well as responses that the individual can give to these pressures.

We showed that the generic construct “environment” and its effects can be fruitfully subdivided in those exerted by the network and the context. On the one hand, network effects are those that swing individuals toward specific political choices or, instead, contribute to maintaining, or crystallizing electoral choices by means of interactions (Huckfeldt Sprague 1987). Chapter 2 investigated how exposure to dissonant views in one’s discussion network can convince people to change their behavior. It has been stated that among four possible, theory-driven, outcomes (persistent agreement and disagreement, influence and selection) influence is the most interesting pattern since it allows to assess clearly whether and in which ways the network interacts with individual behaviors.

Synthetically, chapter 2 provided the following results:

- a)* interpersonal influence, consistent with previous literature, contributes to shaping people voting behavior;
- b)* influence effects hold both in non-directional and in directional ways, that is, respondent is influenced by her

discussant toward the party supported by the discussant in  $t_0$ .

Context, on the other hand, represents the broader environment which individuals are subjected to (Shin Agnew 2002, Shin Agnew 2008). According to the theoretical framework developed in the work, characteristics of the context crucially contribute to shaping the propensity that the individual has of interacting with discussants who present specific characteristics. This effect, exerted by an environmental level toward another – lower – level, has been shown in different ways, especially in chapters 3 and 4.

Synthetically, results of chapter 3 can be summarized as follows:

- a) relational and contextual environments, namely networks and local places, taken singularly, exert some sort of pressure on individuals;
- b) these two environments, moreover, interact among each other, that is, there is a tradeoff of the environmental levels that affect the individual;
- c) this is particularly valid for people exposed to non-cohesive ties.

Results of chapter 4, rather, can be listed as follows:

- a) diffusion processes can be intended as an interaction between relational and contextual environments over time and, at the individual level, can be fueled by the exposure to less cohesive circles;
- b) this diffusion is mediated by an exogenous measure of viability for the party, which has been interpreted as the threshold for the adoption.

In these chapters, it has been stressed that the relationship between contexts and different circles (namely, different subgroups in which the network can be subdivided). The main

characteristic of circles that has been identified as crucial in predicting individual political behaviors is the cohesiveness of these groups, that is, the propensity to be surrounded by intimate or non-intimate ties. It has been argued that different intimacy (or “tie strength”) levels lead to different ways in which networks can alter the relationship between individuals, their networks and contexts. As expected both in chapters 3 and 4, the more the relationship is intimate, the more it alters the relationship with the broader climate of opinion (that is, the context), making an individual less sensitive and more coerced toward this latter. More specifically, as stressed before, the more a circle is intimate, the more it represents some kind of a “social bubble” in which the individual has a distorted idea of the larger climate of opinion. Moreover, people who live their everyday life in this social bubble tend to be more coerced by their discussants in adopting a “normal” (that is, consistent with the group) behavior (Berelson Lazarsfeld McPhee 1954). On the other hand, citizens who are embedded in less intimate networks are more aware of the broader climate of opinion that, at the same time, is also less coercive.

The following paragraph (paragraph 1) investigates main results of the three empirical chapters and assesses whether these are consistent with chapter 1 theoretical framework. Paragraphs 2, 3 and 4 stress theoretical arguments concerning the three topics that we have briefly outlined above, that is, the relations among environmental levels, the importance of network intimacy and the role of the individual characteristics. Finally, the last paragraph will be focused on the methodological challenge faced throughout the work, arguing that more refined data and methods could be able to extend our knowledge.

## **Summary and main results**

As pointed out in chapter 1, four main theoretically relevant strategies have been found: the first is the so-called persistent agreement, that is, the “normal situation” in which, given two

or more periods of time, the reference individual and her discussant agree. Conversely, persistent disagreement (Huckfeldt Johnson Sprague 2004) has been detected as a situation that can be sustained by citizens, given certain “structural” conditions. However, two other relational strategies that we have defined dynamic, can be detected: according to the first one (selection) it is expected that disagreeable discussants can be expunged from the people with which one is in relation with. Selection has repeatedly been proved to be, overall, a quantitatively non-relevant outcome (Bello Rolfe 2014, Mancosu Vezzoni 2017). The second strategy, influence, expects that people can be actively influenced, or can influence their discussant, in order to arrive, from a situation of disagreement, to an agreeable relation. In chapter 2, it has been shown that the influence mechanism is adopted by people when reacting to dyadic stimuli. Moreover, it has been provided unique and stronger evidence to this mechanism by testing it directionally. Previous literature focuses on the relationship between disagreement and volatility, but no research investigated where this volatility is directed: one might indeed argue that in case of disagreement people are pushed farther from their associated, in a way that resembles polarization mechanisms. We have seen that a disagreement situation actually increases people’s propensities to switch to the party voted by their discussants. The directional influence argument has been tested by employing the so-called stacking technique: stacking the data matrix, together with providing adjustments to individual characteristics variables, has been demonstrated to be a good compromise for the study of multi-party systems, especially in situations in which we are interested in effects that encompass every party (Franklin De Sio 2011). In chapter 3, the effect of geographical context in shaping the network has been tested. According to hypotheses exposed in chapter 1, the distribution of political preferences in a geographical (sub-national) space can affect the structure of the networks by providing the opportunities one has in encountering certain party supporters. By means of multilevel regression models, we have found that, as expected, network exposure rep-

resents some kind of “filter” of the broader context (see Mancosu 2016): it has been argued that the network affects the perception that individual has of the broader climate of opinion, boosting or depressing the effects of the context. In this case, it has been stressed that the two levels (the contextual and the network one) interact. Indeed, analyses in Chapter 3 show that the effect of the network on propensities to vote decreases as long as generic party strength increases. In other words, a strong party in the local public opinion climate leads people to have lower network effects. It has been shown, moreover, that the filtering capacity of the network is stronger when one is exposed to a relative. In this way, results confirm the argument that sees the family as a “bubble” in which the stimuli coming from the external environment are hindered. As in the previous chapter, we employed the so-called stacking technique to test our hypotheses (van der Eijk et al. 2006).

Chapter 4 provided a stronger evidence of the shaping effect that had been theorized above. Employing, as a case study, the rise of Movimento 5 Stelle in 2013 elections, it has been demonstrated that the shaping effects enacted by contextual level affected the prevalence of Movimento 5 Stelle supporters over time, and this has contributed to enhancing the probability of being affected and, thus, converted to the new alternative. The testing strategy, rather than focusing on usual regression techniques (Vezzoni Mancosu 2016), was based on a quite innovative application (compared to usual simulation strategies) of agent-based modeling. As stressed in chapter 4, the usual aim that agent-based models fulfill is related to the logical consistency of the mechanisms hypothesized. First, the model tends to be externally valid (Liu 2011). Second, it assumes that agents are connected among them by a network that presents structural characteristics that define the intimacy among agents. The agent-based model showed several characteristics of the diffusion process of the Movimento 5 Stelle but also gave useful insights of the relation between contexts, networks, and individuals.

## **Environmental interdependency**

Results of chapters 2, 3 and 4 contributed to testing some of the expectations that were exposed in chapter 1, and, moreover, contributed to raise some questions related both to the methodological and the theoretical sides. Similarly to Huckfeldt and Sprague (1995) we have shown «that democratic citizenship involves something more than individually isolated and politically independent citizens making choices that are socially and politically divorced from their surroundings.» Especially in chapter 4, the strict relationship between the shaping effects that context displays and the immediate reaction of the network has been exposed. In this process, the most relevant role is covered by what we could call the “dialectic” relationship between the individual and her environment (Berger Luckmann 1991), that is, the fact that once political communication is present in a social system (and that is truer during an election campaign), individuals are, at the same time, both subjected to the political influence enacted by someone else and actors of political influence. In a certain way, a diffusion process is one of the social processes in which this dialectic relation is better observable, because it allows showing, starting from an individual who is not “converted” to the novelty, the process according to which he/she is exposed to the novelty itself by means of interactions, is converted to that novelty and, finally, contributes to be part of the ego-network of someone else. In other words, by employing diffusion processes, it is possible to outline efficiently a relation that is permanent inside a social system but is usually difficult to isolate, both theoretically and empirically. The interdependency among individuals, however, is not the only dialectic pattern that we can find in our theoretical framework. In addition to this type of relationship, which can be called *horizontal interdependency*, it is possible to witness quite clearly also a *vertical interdependency*. Also in this case, the agent-based model in chapter 4 is enlightening. The role of the individual (the lower level) the network (the second level) and the time-

context (the higher level) are strictly entangled: conversions among individuals change the propensity to be exposed to discussion networks and, at the same time, change the contextual structure of opportunities. The structure of opportunities enhances the probability to be exposed, and that of being converted to the innovation by people who are not (yet) converted. Thus, even though we have differentiated theoretically and analyzed environmental levels and individual, it is worth to stress that these subdivisions are just a matter of theoretical and technical convenience, given that environmental stimuli and individual answers happen at once, as a part of a unique process. The subdivision between the reference individual and other citizens (people who belong to the reference individual's ego-network) is, consistently with what said above, a theoretical simplification that allows us to differentiate the individual and her environment easily.

There is another theoretical workaround that has been employed in order to simplify theoretical argument and analysis: geographical and temporal contexts have been differentiated in order to make easier theoretical arguments about the effect exerted by these on the networks. Actually, no only-geographical effect exists, and we cannot talk, in the real world, about only-temporal context. More realistically, a spatiotemporal context, that is, the change in time of sub-national geographical patterns of party support, is the one that actually contributes to shaping the discussion network.

### **Strength of relations**

One of the leitmotifs of this work is undoubtedly related to the strength of the interpersonal interactions that individuals have with her network. Strength, the main characteristic of these relations, has been represented in various ways, but its role in shaping attitudes and behavior is assumed to be, qualitatively, the same. Intimacy affects the differences with which people can be exposed to networks and, indirectly,

contexts. In chapter 1, it has been argued how cohesive circles and non-cohesive ones differ for their capacity to coerce individuals who belong to them at different levels: individuals exposed to typically homogeneous familiar groups tend to be more coerced by their relational surroundings with respect to people who are mainly embedded in weak ties or non-relative circles. This characteristic of different social circles presents, however, some sort of tradeoff. Coercion, indeed, leads to make relatively unlike the exposure to innovative ideas, or ideas that belong to minorities in the group. At the same time, non-cohesive social groups tend to be constituted by weak ties and, because of this, they allow the individual to be more embedded in the “real public opinion.” People who are exposed to a non-cohesive circle present – with fewer biases compared to those exposed to close, homogeneous circles – a clearer image of the public debate and the “balance of forces” that characterizes a specific public opinion.

Throughout the work, we treated mainly familiar and non-familiar circles, although, in many studies, the effects of friends, or spouses, for instance, are treated as separated (Huckfeldt et al. 1995, Erisen Erisen 2012, Mancosu Vez-zoni 2017b). In our work, however, friends’ effects – who are known to exert a stronger influence compared to other people – are usually not significantly different from those exerted by acquaintances. Moreover, when explicitly assumed that the “dividing line” between circles is related to the relative/non-relative cleavage, models turn out to fit well (see especially chapter 3 and 4). Comparing this result with, for instance, US research (Huckfeldt Sprague 1995, Huckfeldt et al. 1995), where intimacy usually affects differently people, depending on the fact a person is a relative, a friend or a simple acquaintance, Italian data seem to behave differently. The apparent difference between relatives and non-relatives could be related to the importance, in Italy, of the family in many spheres of social activities (such as the economic life, see Esping-Andersen 2013, Reher 1998).

## **The role of the individual**

Another point on which we lingered on is the role of the individual. As pointed out above, we stressed that results are consistent (see also Bello Rolfe 2014) in finding that influence actually exert a substantial effect on political choice. This is a strong evidence of the fact that people are, as stressed above, agreement-seekers and that avoiding conversations with a disagreeable person is more difficult than expected.

An underdeveloped side of the work is the little empirical deepening of how individual characteristics moderate different environmental effects. For instance, as stressed throughout the literature (Zaller 1992) different levels of political sophistication can make the individual more or less permeable toward environmental effects. As pointed out by Sidanius and Lau (1989) in their context-related theory of extremism, political sophistication allows people to be more protected toward disagreement and to sustain their argument even though they are not popular in the context. On the contrary, people who are not able to sustain their opinion coherently and defend it are more prone to avoid disagreeable opinions and, thus, tend to be more agreeable. With this respect, it is important to state that the work did not provide any conclusive answer, and more research is needed in order to assess the relationship between exogenous individual characteristics and dyadic relational strategies that are enacted during and after election campaigns.

## **From concepts to results: techniques and data**

In addition to theoretical arguments, one of this work's aims was to provide new methodological instruments that could account for the complex set of relationships that are implied by these theories. The primary technical challenge that European students of socially-related voting behavior must deal with is the fact that, as stressed many times along this work, a large

part of previous empirical tests in this topic are performed on two-party systems. It must be stressed that, usually, hypotheses related to the social logic of politics are not focused on a single party, but, instead, tend to be general and to encompass every party in the political spectrum. Examples of these hypotheses can be found both in chapter 2 and 3. We are not interested in assessing whether the contextual or network prevalence of party A could lead to the change of propensity to vote for this same party. Rather, we are interested in assessing relations between the individual and environmental levels that concern every relevant party in the political spectrum. The stacking procedure has been employed in order to assess a relationship between a generic party and a generic propensity/likelihood to vote for that party, for both respondents and discussants. Results show us that stacking can be employed usefully in providing results for network and contextual effects in multiparty systems – such as many of the European systems – and, in case we could have comparative data, among different constraints sets. The standard stacking procedure was slightly modified in chapter 2 in order to test systematically influence processes in a directional way (by employing a first-difference dependent variable) and, as it can be seen, it demonstrated to be a quite ductile technique that can be employed in order to test many theoretical statements.

In addition to stacking procedures, the employment of agent-based modeling and, especially, of a model that aimed at being externally valid, showed to be extremely promising in studying processes enacted among individuals, networks, and contexts that are usually extremely difficult to be tested systematically by means of usual regression models. As stressed in chapter 4, only indirect proof of our theoretical arguments can be extracted from these techniques' results. By means of agent-based models, the whole mechanism is simulated, and aggregate results of this complex process can be analyzed in order to assess whether relational and individual mechanism are actually going in the expected direction. As pointed out in chapter 4, an additional attempt to test a diffusion process with case study da-

ta was made, by providing an externally valid simulation, that is, a simulation that is aimed at reproducing, instead of a generic process, the mechanisms that were in action during the election campaign of 2013, concerning the Movimento 5 Stelle pre-election trend. It is important to stress that, aiming at simulating not just a generic process, but rather *that* process, exposes the analysis to a series of technical problems and workarounds, which, given the relatively low amount of literature in political science, should be deepened in other works: for instance, the routine briefly explained in chapter 4 (and extended in Appendix), that should make the simulation consistent with the real data, leads to a number of theoretical, technical and computational difficulties in many sides of the model, from the choice of initial values to the employment of sensitivity analyses. All these problems might be deepened in subsequent works, also because the role of externally valid agent-based modeling, according to who writes, could become crucial in the following years, making these techniques one of the fundamental instruments of political and social sciences.



### **ABM and external validity**

According to research methodology dealing with ABMs, the most straightforward way to performing external validity procedure is the so-called Indirect Calibration approach (IC, Mehta Bhattacharyya 2006, Liu 2011). The IC approach is based on four stages (Liu 2011). The first stage is aimed at representing “a set of stylized facts [the researcher] is interested in” (Liu 2011); the second stage is to build an ABM in a way that keeps the rules as similar as possible with respect to the stylized fact. The third stage concerns the initial values of the simulation, which must be as close as possible with respect to the real data. The last stage is to seek for simulation evidence that contradict or corroborate theorized fact. The IC procedure has the main advantage of being a substantially theory-driven procedure, which is sufficiently general not to demand a considerable amount of sophisticated datasets and coherence between simulation and real data (Liu 2011).

First, two main individual characteristics related to every agent must be operationalized in the simulation. The first one is a binary measure, that is, the adoption/non-adoption variable that can be easily extracted from the data by employing the vote intention variable of the Movimento 5 Stelle vis-à-vis every other choice. The second is the individual threshold that, in the simulation, will be measured with the propensity to vote (see chapter 3). The propensity to vote for a party (in this case, for

the Movimento 5 Stelle), represents the individual, exogenous measure of the propensity of being converted to the innovation.

As pointed out before, the simulation is based on a network topographic structure. Agents are nodes linked in a stable way for the whole duration of the simulation. The main need for the

**Table A1.1.** Real data of the ABM four main variables. Correlation matrix (n=993).

	Friend Agr.	Family Agr	M5s Ptv	Vote M5s
Friend Agr.	1,00			
Sign.	-			
Family Agr	0,50	1,00		
Sign.	0,00	-		
M5s Ptv	0,03	-0,03	1,00	
Sign.	0,28	0,28	-	
Vote M5s	0,01	-0,06	0,67	1,00
Sign.	0,75	0,04	0,00	-

simulation is the capacity to differentiate between strong and weak ties. As Granovetter says, two nodes form a strong tie when they share a high number of other ties (Granovetter 1973). According to the “forbidden triad” argument (Granovetter 1973, Granovetter 1983), the situation in which A has a strong relation with B, B has a strong relation with C, and A and C do not know each other is very unlikely. Thus, in order to assess if two nodes share a strong or a weak tie, the Jaccard similarity index will be provided (Jaccard 1912). Jaccard similarity, translated into network analysis, is a measure that tells us, in percentage, how many other nodes two agents share (Adamic Adar 2003). If Jaccard similarity between agents A and B is equal to 1, that means that A and B share all their nodes. If it is 0, it means that A and B, besides being tied, do not share any other node in common.

A Watts-Strogatz (WS) random network topology is employed (Watts Strogatz 1998) since it provides a high level of clustering with respect to basic random networks (Watts Strogatz 1998).

**Table A1.2.** Real data of the ABM four main variables. Bivariate tables (n=993).

		Family agreement							Tot
		0%	10%	25%	50%	75%	90%	100%	
Friend Agreement	0%	0.5	0	0.1	0	0.1	0.1	0	0.8
	10%	0.2	0.4	2.0	0.8	0.5	0.2	0	4.1
	25%	0.1	1.6	5.7	6.2	3.4	1.4	0.4	18.9
	50%	0	0.4	3.2	9.7	11.7	3.8	2.3	31,1
	75%	0.2	0.4	1.5	5.1	9.6	7.4	2.3	26.5
	90%	0.1	0.1	0.6	1.5	3.3	7.0	2.7	15,3
	100%	0	0	0.1	0.1	0.5	0.5	2.0	3.2
	Tot	1.1	2.9	13.3	23.5	29.1	20.3	9.8	100

Ptv	M5s	M5s	Total
	vote=N	vote=Y	
0	43.8	0.1	43.9
1	6.9	0.1	7.0
2	4.5	0.0	4.5
3	3.6	0.2	3.8
4	4.6	0.5	5.1
5	7.6	1.0	8.6
6	4.6	1.6	6.2
7	4.3	2.0	6.3
8	1.8	2.3	4.1
9	1.1	1.3	2.4
10	0.2	7.8	8.0
Total	83.1	16.9	100.0

In order to perform the ABM, and given the aim of performing an externally valid simulation, the initialization procedure of the individual and relational variables will follow real data distributions extracted from the first seven days of 2013

ITANES RCS. It has been decided to choose the first week of data collection because this is the time interval in which the level of the Movimiento is relatively stable (see Figure 4.1).

The variables that are extracted from the real data and that will account for our theoretical expectations are, basically, four. The aforementioned homogeneity of the relatives' and friends' networks (that will account for the exposure and homogeneity of strong and weak ties networks), the vote choice (that will account for the adoption of the innovation) and the propensity to vote for the Movimiento 5 Stelle itself (that will represent the individual threshold). As stressed in chapter 4, the ptv represents the propensity to vote for the party in the future, irrespective from which party the respondent will vote for in the imminent election. As it is possible to see in table A1.1, vote choice and ptv correlate positively. This is consistent with the literature (van der Eijk et al. 2006) which states that people who have higher ptv's for a party tend to have higher propensities to declare to vote for the same party. People who have higher levels of agreement with friends also have higher agreement with relatives (as we can see in table A1.1, the correlation is positive and significant). No other correlation results significant from the table. In other words, translating statistical ideas into substantive arguments, a certain ptv concerning the Movimiento associated with an individual will lead the same individual to have a certain probability of declaring to vote Movimiento, but does not lead automatically to a certain propensity to be in agreement with friends or relative. Vice versa, a certain percentage of friends in agreement leads to a certain distribution of being in agreement with relatives but does not tell us anything about Movimiento ptv or vote choice. Table A1.2 shows bivariate results of friends' and familiars' networks homogeneity (top panel, cell relative frequencies), and ptv and vote choice (bottom panel, cell frequencies) for the first seven days of data collection. As expected from the correlation matrix in table A1.1, people who have higher levels of agreement with friends' circles also have high levels of agreement with relatives' circles. It is important to underline that the diagonal and cells nearby cas-

es being in strong agreement with both the circles is over-represented with respect to the rest of the table. At the same time, having a specific vote choice leads to a specific ptv distribution, in which people who declare to vote for the Movimento are over-represented in the right tail of the distribution and vice versa.

### **Externally valid initialization with relational variables**

Initializing the simulation in order to keep it externally valid needs that, on the aggregate level, the two tables above (see Tables A1.2) can be reproduced in the multi-agent model. The joint distributions of individual characteristics are relatively easy to implement in a computer simulation. Less straightforward is the implementation of individual traits, by keeping under control relational characteristics (such as the level of homogeneity in different groups). For this reason, we employ a random search approach (Spiriti 2009), a technique aimed at solving this issue. In the sub-paragraphs that follow we will present the problem of making relational variables externally valid in an ABM, a formal solution (written using pseudo-code) and the solution that has been used to produce the final networks in the ABM employed in chapter 4.

#### *The problem*

Imagine a lattice structure as that exposed in Table A1.3, left panel. The lattice structure is composed of 9 agents who can be A or B agents. Imagine that A and B represent parties support. If we did not need any relational validity criteria, but, rather, we were interested only in individual criteria, making the ABM valid would be quite easy. Imagine that we have real data that tells us that A agents are 44% of the real-data sample, while B agents are 56% of the same sample. We can validate our ABM by assigning a definite probability to every cell in the lattice and by comparing it with a random number drawn from a uni-

form distribution. Written in pseudo-code, this operation should be something similar to what exposed below:

```

FUNCTION indiv
FOR (i=1, i<=3, i++)
FOR (j=1, j<=3, j++)
rnd = DRAW_RANDOM_UNIFORM(0,1)
IF rnd <0.44 THEN matrix[i,j] = A
ELSE matrix[i,j] = B

```

**Table A1.3.** Validating an ABM only with individual characteristics.

?	?	?	A	A	A	A	B	B
?	?	?	B	B	B	B	A	A
?	?	?	B	A	B	A	B	B

The routine, for every cell  $i,j$  of the matrix, draws a random number from a uniform distribution. If the random number is below 0.44, the agent is an agent A. Otherwise the agent is B. In this way, it is possible to obtain randomly lattice structures that respect the requirement of having a 44% of A agents and a 56% of B agents. A and B agents could be distributed in several ways, such as in the central and right panel of Table A1.3.

However, we might be not only interested in providing simple individual validity, but also relational one. That means that the position of A and B agents must be validated by the aid of real data. Since we have just two types of agents (A and B agents), we need only one distribution that tells us, in the real data, how agents should be placed on the lattice. Imagine that we actually have those data and that the distribution can be depicted as follows. 33% of agents are surrounded by 60% of agents who agree with them (that is, A agents are surrounded by 60% of A agents and 40% of B agents), 44% of agents agree with 66% of surrounding agents, 11% of agents agree with 75% of agents and 12% of agents agree with 80% of surrounding agents. Both the individual and relational requirements are depicted in Table A1.4, left and right panel. The requirements

showed above can, of course, be fulfilled by recurring to a closed solution.

**Table A1.4.** Individual and relational validation requirements.

A or B agents	%	Agreement	%
A agents	44	With 60%	33
B agents	56	With 67%	44
Total	100	With 75%	11
		With 80%	12
		Total	100

It is possible to start from one part of the lattice and providing some pseudo-random procedures that, iteratively, could lead to a solution of the problem. In this case, however, we opted for a quicker and effective method that can be defined a *random search method*.

## 2.2. The random search method: theory and pseudo-code

A brute-force search, sometimes called “exhaustive search,” is a widely used method of finding non-closed solutions in computer sciences, mathematics (Slaney Fujita Stickel 1995), cryptography (Sasaki Aoki 2009) and biology (Holm Park 2000). One of the main characteristics of the brute-force search is that, given a problem that can have finite solutions, the algorithm tries every possible parameters’ combination until the subroutine converges. A more promising solution for our case is a variant of the brute-force method, based on random number generators (the so-called “random search”), that, thus, does not exhaust every possible combination of parameters (Morton Mareels 2000).

The main advantage of this family of search methods is the fact that the algorithm does not need closed solutions (that is, the researcher is not requested to provide some kind of mathematical workaround to find iteratively the parameters combination that fulfills validation requirements). The only possible drawback of

this kind of procedure is that it can be demanding in terms of computational power and CPU employment. A random brute-force procedure to find a structure of the lattice that fulfill the two requirements, the individual and the relational one, can be written in pseudo-code as follows.

```

FUNCTION indiv
FOR (i=1, i<=3, i++)
FOR (j=1, j<=3, j++)
rnd = DRAW_RANDOM_UNIFORM(0,1)
IF rnd <0.44 THEN matrix[i,j] = A
ELSE matrix[i,j] = B

FUNCTION validate
WHILE (mat_validated=0)
RUN indiv
rel_table = CONSTRUCT_REL_TABLE(matrix)
IF rel_table = real_rel_table THEN mat_validated=1
ELSE mat_validated=0

```

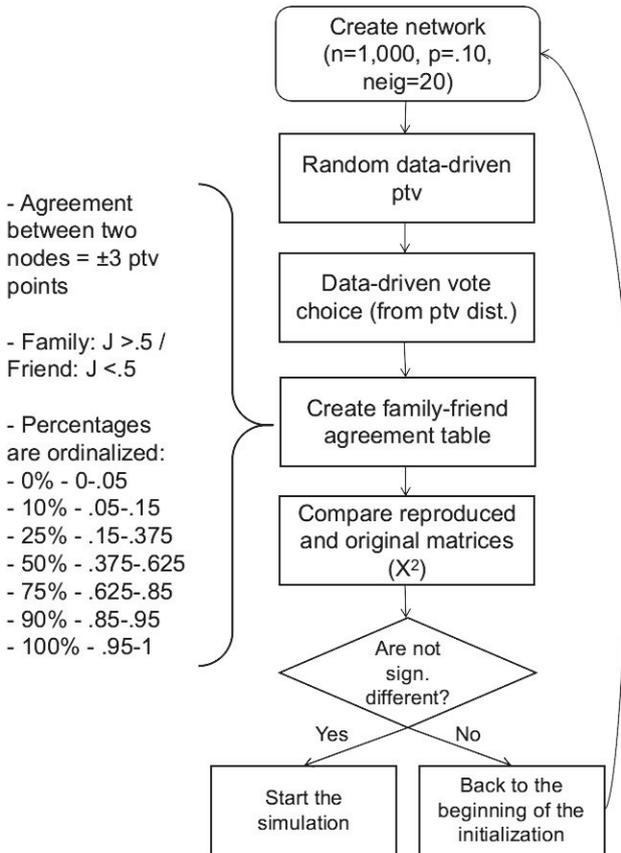
The pseudo-code is constituted by two functions: the aforementioned `indiv` function provides a matrix in which the sole individual characteristics distributions are taken into account. The validation function is based on two different steps. A subroutine constructs the relational table (namely, the distribution of the simulated random-lattice).

The second step compares the simulated data with the real one. If the reproduced table is different from the real-data one, the iteration restarts by producing another random lattice whose adherence to real data will be tested. The process ends when the two lattices are equal (in this case, the third lattice of Table A1.3 is one of the solutions of the process).

### The solution in our ABM

So far, we have focused on a simplified case with respect to the ABM in chapter 4.

First of all, the example deepened above is based on lattice data, and the ABM in chapter 4 is developed with network data. Second, the example presented above must control for just one source of agreement/disagreement, while, instead, chapter 4's ABM presents two different "agreement rules" (with friends and with relatives). In other words, an agent must be in agree-



**Figure A1.1.** Flowchart of the ABM initialization.

ment with a certain proportion of friends and familiars, not necessarily identical. During the initialization, once randomly inserted, individual characteristics serve to construct a simulated relational table that will be compared to the real-data one.

In Figure A1.1 it is exposed a flowchart representing the initialization process and the random search of a data-driven network. The first step is the creation of a Watts-Strogatz random network with 1,000 agents, re-writing probability of .10 and 20 neighbors on average (Watts Strogatz 1998). Sensitivity tests have been made in order to assess whether the network structure could influence the outcomes of the simulation. Simulation has been run with a structure cases/p/neighbors equal to 100/0.001/8, 200/8/0.0025 and 500/16/0.0025. No relevant differences in the outcomes have been registered. Once created the network, data-driven ptv's are randomly assigned to every agent (the proportion of different ptv for the Movimento is extracted from the actual distribution in the RCS fist week data). Given the ptv's, binary vote choice (declaring to vote or not for the Movimento) can be extracted from the data easily (see table A1.2). Ptv's will serve for two aims: the first is to operationalize the threshold, the second is to operationalize agreement between the agent and its network, that will be used, in turn, to compare the data-driven and the simulated matrix. In order to validate the ABM, several decisions must be taken: first of all, the agreement between two agents is coded in the simulation as a difference of fewer than 3 points in Movimento's ptv (see below). If agent<sub>1</sub> has a ptv equal to 2 and agent<sub>2</sub> has a ptv equal to 4, the two agents are coded as in agreement. Moreover, relatives and friends are operationalized as having Jaccard similarity index, respectively, larger than .5 and lower than .5. Having stated these two properties, every agent is in agreement with a particular share of its friend or relatives. Finally, the shares of agreeable agents must be "ordinalized" in order to make it compatible with the conjoint distribution presented in table A1.2. As for networks characteristics, several sensitivity tests have been made in order to assess whether different agreement, friends/relative, and percentage parameterizations could influ-

ence outcomes. It actually turned out that these combinations are the sole realistic ones that allow the random search procedure to fit and provide a suitable network. Once having stated these constraints to our validation process, we can employ two different tables: the first one is the data-driven table, the other one is the simulated table, constructed accordingly to the rules above, as in table A1.5. Rather than  $a_{11}$ ,  $a_{12}$  or  $s_{11}$ ,  $s_{12}$  etc. we will find the cell percentage of every (simulated and real) conjoint distribution of agreement with different circles.

**Table A1.5.** Real and simulated cross-tabulations: example.

		<i>Real data</i>						
		Friends						
		0	.1	.25	.50	.75	.90	1
Relatives	0	$a_{11}$	$a_{12}$	$a_{13}$	$a_{14}$	$a_{15}$	$a_{16}$	$a_{17}$
	.1	$a_{21}$	$a_{22}$	$a_{23}$	$a_{24}$	$a_{25}$	$a_{26}$	$a_{27}$
	.25	$a_{31}$	$a_{32}$	$a_{33}$	$a_{34}$	$a_{35}$	$a_{36}$	$a_{37}$
	.50	$a_{41}$	$a_{42}$	$a_{43}$	$a_{44}$	$a_{45}$	$a_{46}$	$a_{47}$
	.75	$a_{51}$	$a_{52}$	$a_{53}$	$a_{54}$	$a_{55}$	$a_{56}$	$a_{57}$
	.90	$a_{61}$	$a_{62}$	$a_{63}$	$a_{64}$	$a_{65}$	$a_{66}$	$a_{67}$
	1	$a_{71}$	$a_{72}$	$a_{73}$	$a_{74}$	$a_{75}$	$a_{76}$	$a_{77}$

		<i>Simulated data</i>						
		Friends						
		0	.1	.25	.50	.75	.90	1
Relatives	0	$s_{11}$	$s_{12}$	$s_{13}$	$s_{14}$	$s_{15}$	$s_{16}$	$s_{17}$
	.1	$s_{21}$	$s_{22}$	$s_{23}$	$s_{24}$	$s_{25}$	$s_{26}$	$s_{27}$
	.25	$s_{31}$	$s_{32}$	$s_{33}$	$s_{34}$	$s_{35}$	$s_{36}$	$s_{37}$
	.50	$s_{41}$	$s_{42}$	$s_{43}$	$s_{44}$	$s_{45}$	$s_{46}$	$s_{47}$
	.75	$s_{51}$	$s_{52}$	$s_{53}$	$s_{54}$	$s_{55}$	$s_{56}$	$s_{57}$

.90	S <sub>61</sub>	S <sub>62</sub>	S <sub>63</sub>	S <sub>64</sub>	S <sub>65</sub>	S <sub>66</sub>	S <sub>67</sub>
1	S <sub>71</sub>	S <sub>72</sub>	S <sub>73</sub>	S <sub>74</sub>	S <sub>75</sub>	S <sub>76</sub>	S <sub>77</sub>

**Table A1.6.** Simulation parameters.

<b>Parameter desc.</b>	<b>Value</b>
<i>Network characteristics</i>	
Number of nodes	1000
Number of neighbors (on average)	20
Probability to change tie (WS model)	0,1
<i>Relational characteristics</i>	
Jaccard Similarity for Friend	J ≤ .5
Jaccard Similarity for Relative	J > .5
Ptv difference for agreement (+-)	3 points
0%	[0 – 0.05)
10%	[0.05 – 0.15)
25%	[0.15 – 0.375)
50%	[0.375 – 0.625)
75%	[0.625 – 0.85)
90%	[0.85 – 0.95)
100%	[0.95 – 1]
Friends agreement	Data-driven
Family agreement	Data-driven
<i>Individual characteristics</i>	
Ptv	Data-driven
Vote choice	Data-driven

If, say, 30 agents agree with 50% of friends and 50% of relatives, s<sub>44</sub>, the cell of the 50%-50% combination will be 3 ((30/1000)\*100). Of course, the real-data matrix is fixed during

the random search procedure. How do we assess whether the difference between the two tables is significant or not? For our purpose, it is possible to say that assessing the difference between these two tables is very similar to a chi-square test, in which the real-data matrix is the expected data matrix, and the simulated data is the observed matrix. A simple Pearson's test of independence will provide a chi-square statistics that will assess the probability that the two matrices are statistically different (Agresti Kateri 2011). If the two matrices are not different at a threshold of 10% (this happens in case the differences between the random matrix and the real-data matrix are small) we accept the null hypothesis, we state that the two tables are not significantly different<sup>1</sup> and the routine will use the network just constructed to start the simulation (see chapter 4 for agents' rules). The random search procedure, on the contrary, restarts in case of the two matrices are statistically different, starting from the beginning of the initialization subroutine (producing a new network with, for each node randomly assigned ptv's). The list of data-driven and manually-coded parameters can be found in Table A1.6.

<sup>1</sup> In the code presented in table 5.3, the chi-square is made by means of log-linear models (Agresti 2014). Of course, the two procedures are mathematically equivalent.



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