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Neighborhood effects and pro-environmental behavior: The case of Italian separate waste collection

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ABSTRACT

This paper investigates the relationship between neighborhood effects and pro-environmental behavior. Working on 1999–2012 data on separate waste collection in Italian provinces, a spatial econometric analysis is carried out. While a substantial stream of research focuses on recycling behavior determinants, spatial dependence among different inter-regional geographical areas has been less studied. Here, empirical support is provided to the existence of spatial effects and heterogeneous behavior in the Italian context. It is found that waste collecting habits tend to be strongly influenced by proximity effects, either in a positive or negative way. Moreover, the paper tests the nature of such influence in terms of time effects, by evaluating non-contemporary spatial dependence. "Good" (or "bad") pro-environmental behavior as a persistent dynamic effect is found, with the possibility of both self-sustaining virtuous socio-spatial dynamics and perverse lock in. These results call for a rethinking of environmental policies, and in particular for a stronger focus upon the social dimension of spatial diffusion phenomena in pro-environmental behaviors.

1. Introduction

Waste collection and recycling is a complex activity, that may take a multitude of different forms (Rodrigues et al., 2016), and presents relevant differences according to the type of waste (Greco et al., 2015). Varying levels of performance of waste management systems may have a huge impact at all territorial levels. In particular, separate waste collection rates as a pro-environmental indicator of sustainability have increasingly become an object of public concern. Recycling is often considered by citizens a time consuming, annoying activity to be eschewed when possible. But recycling behaviors are very sensitive to the psychological determinants of everyday pro-environmental behavior. Moreover, they have positive long-term societal and environmental consequences, once pro-social environmental dispositions are successfully harnessed in the local population, and psychological resistances are consequently overcome (Nordlund and Garvill, 2002). Most of the literature makes households as the main unit of analysis, and considers recycling as a major test bed of households' pro-environmental behavior (Tonglet et al., 2004). In particular, the literature has placed major emphasis up on the factors that influence recycling behavior. Special attention has been paid to the societal forces that impede the emergence of socially sustainable recycling behavior (Timlett and Williams, 2009). With global environmental awareness gaining momentum, and with the sharpening focus of local policies upon environmental responsibility as a form of active citizenship, there has been an almost ubiquitous effort to improve citizens' commitment to recycling as a moral imperative, also by means of massive social campaigns. Within this context, as Barr et al. (2001) point out, the political agenda of developed nations has been increasingly addressing households, in order to achieve sustainable waste management targets. At the same time, a more responsible waste disposal behavior and more effective recycling practices have been strongly advocated, and enforced whenever possible (UNCED, 1992).

Such a multi-faceted theme calls for a major interdisciplinary research effort, so as to develop a well-balanced, comprehensive approach that takes all relevant factors into account. An early relevant contribution is this vein is Hornik et al. (1995), whose

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extensive meta-analysis summarizes the impact of different variables by grouping them into five categories: Extrinsic Incentives, Intrinsic Incentives, Internal Facilitators, External Facilitators and Demographic Variables. Among the five meta-factors, the strongest predictors of recycling turned out to be Internal Facilitators. Some External Incentives, such as social influence and monetary rewards, also played a significant role, even if the effect of the former seemed more conducive to long-term changes in behavior than the latter. In case of monetary incentives, pro-environmental behavior usually persists only as far as the incentive is in place, and may even cause motivational crowding out when it ceases (Frey and Jegen, 2001). In addition, price schemes and monetary rewards have been extensively studied (Curlee, 1986; Jenkins et al., 2003), as well as effects of legal measures such as mandatory recycling laws (e.g., Lanza, 1983; Hicks et al., 2005; Viscusi et al., 2013), and the mediating role of social capital (Jin, 2013; Liu et al., 2014). Recently, Miafodzyeva and Brandt (2013) have classified variables affecting recycling behaviors into four groups: socio-psychological, technical-organizational, individual socio-demographic and study specific. The strongest predictors of households' recycling behaviors were identified as: convenience, moral norms, information and environmental concerns – all of which, interestingly, are culturally connoted to some extent.

The crux of the issue is that, even though households are generally aware of the social benefits of recycling, such awareness does not necessarily reflect into actual recycling practice. Public pedagogues make a case for more effective participation and learning in the context of environmental and sustainable development education (e.g. Van Poeck and Vandenabeele, 2012; Læssøe, 2010). It is argued that pro-active social exchange and responsible commitment attitudes are crucial for the achievement of solid, commonly maintained recycling habits. Sociologists, on the other hand, emphasize how social pressures and norms may play a huge role in enforcing and stabilizing such dispositional orientations (e.g., Burn and Oskamp, 1986; Tonglet et al., 2004; Hage et al., 2009).

To appreciate how pro-environmental behavior evolves in a society, however, one needs to go beyond the perspective of the single household, and consider social transmission effects – and socio-spatial ones in particular. Truelove et al. (2014) move from a complex theoretical framework to pinpoint the social and behavioral key variables that should drive environmental policymaking at the spatial level. Discussing socio-spatial transmission effects in detail, however, falls outside the scope of this paper. The present investigation rather focuses on whether socio-spatial contexts with virtuous recycling behavior exert a positive influence on households living in less virtuous nearby contexts, causing an 'infectious' improvement in pro-environmental orientations. In the affirmative case, reframing waste recycling as a complex socio-cultural phenomenon, and fully taking into account the influence of socio-spatial factors, can considerably improve the understanding of waste recycling habits – and on a more general note, of pro-environmental behaviors (Bilz and Nadler, 2014). A pioneering anticipation of this approach is found in Oskamp et al. (1991), who studied the attitudes of residents in an early phase of an urban curbside recycling program, where 95% of those who recycled reported that their friends and neighbors recycled too. The awareness that neighbors and social acquaintances are recycling provides a cue to recycle in turn. To capture such factors, this paper considers socio-spatial effects at the province level, i.e. an intermediate level of spatial aggregation between single households and whole regions.

Italy represents as interesting case study in this regard. Since the 1970s, several European countries set up and implemented regulatory mechanisms in order to deploy an efficient waste management system. Throughout the 1980sand the early 90s, Italian waste management was still lagging behind the front runner countries. Eventually, pressured by EU environmental policies, as well as by social, environmental and economic needs, the Italian Government issued the Legislative Decree no. 22/1997, the so called Ronchi Decree (Gazzetta Ufficiale, 1997). As Fiorillo (2013), points out, since 1998 Italy experienced an increase in separate waste collection, whose rate reached 27.5% in 2007, up from a benchmark of 13% in 1999. According to Fiorillo, a possible explanation of this drastic improvement in separate waste collection has been the easier availability of recycle bins, which considerably simplified household recycling. Lack of facilities as a barrier to effective waste management is a common finding in the empirical literature (Coggins, 1994; Perrin and Barton, 2001; Omran et al., 2009). Barr (2007) also points out how situational variables (more specifically, logistical factors such as the presence of recycling services and facilities) are significant in shaping recycling attitudes.

Paci and Becagli (2009) indicate as a possible complementary explanation the role of regional provision and planning strategies, together with certain structural features of the waste management sector companies. The superior performance of some regions may be due to the effect of regulatory mechanisms in line with European standards and policies, and responsive to the structural features of the local corporate environmental sector. But there is still vast room for improvement. Italy's waste management performances call for further monitoring and evaluation in that, until recently, some areas, especially in southern Italy, have experienced serious crises, mainly due to exceedingly low rates of separate waste collection (D'Alisa et al., 2012).

There is in fact a clear-cut dual imbalance in waste recycling performances in Italy. It is therefore legitimate to ask whether the North vs. Center-South Italian divide may also be the consequence of neighborhood effects, where for instance different local notions of civic culture and varying levels of social capital influence the pro-environmental orientations of citizens. This paper addresses this problem through econometric spatial analysis. It is found that (socio-spatial) neighborhood effects, probably caused by imitation-driven social learning processes, are indeed at work in the Italian case, and show significant time persistence. Continued, targeted policy action is thus called for to tackle perverse, and possibly spatially expanding, lock-in situations.

The structure of the remainder of the paper is the following. Section 2 introduces the geographical area of analysis and the data. Section 3 presents the basic framework. Section 4 analyses time persistence issues and delivers the main results. Section 5 discusses the results, and section 6 concludes.

2. Geographical area, conceptual definitions and data sources

Italy has four administrative levels: national, regional, provincial, and municipal. Each of them is entrusted with specific responsibilities concerning waste management within a nested governance framework. The Ministry of Environment deploys the overall waste management strategy within the legislative framework, setting targets at the national level, and preparing the National Waste Management Plan. In turn, Regions develop their own regional waste management plans drawing upon the criteria set in the national legislation. In turn, Provinces develop their waste management plans in conformity with the regional plans.

The Regions issue regulations in compliance with the national legislation and define the "optimal areas for the management of waste" (ATOs). The latter are responsible for meeting the targets on landfilling biodegradable municipal waste (BMW), and separate collection of municipal waste. Moreover, the ATOs are meant to represent a geographical entity designed to make waste