

Collective vs Individual Incentive: A Preliminary Analysis on the Case of Environmental Competitive Challenges in Napoli, Italy

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ABSTRACT

Which incentives are stronger in creating a desirable behaviour through the spreading of a social norm: the ones that work on collective benefits of the individual ones? This is a question which has been differently addressed by the economic literature, and has presented nuanced evidence when faced empirically. The spreading of a social norm is especially important and interesting in the case of waste recycling. Indeed, it is a typical behaviour in which a small personal effort creates a huge collective advantage. At the same time, it is easy to free ride and avoid to recycle, since the cost are spread on a large amount of people. The city of Napoli, Italy has seen two different environmental challenges, a form of policy aimed to spread a social norm of waste recycling, in a short time span. This is an interesting quasi-experimental setting, useful to conduct a preliminary analysis on the effects of collectives versus individual incentives in spreading desirable recycling behaviour. Our preliminary findings suggest that collective incentives have better results in spreading this kind of social norms.

Keywords: Social norms, waste recycling, recycling policy, collective incentives.

Journal of Economic Literature (JEL) Classification : Q53, Q58, D91

1. INTRODUCTION

This work aims to shed some light on the effects of different kind of policies aimed on the spreading and enforcement of some social norms in environmental policies. The two policy that we analyse differs mainly in the nudge: indeed, these grant incentives of different kinds. More specifically, we adapt our theoretical framework to a specific case, studying the case study of two local policies aimed to spread the recycling of paper and cardboard.

In this work we compare the effects of two different challenges aimed to spread a desirable social norm: from one hand we have a collective challenge (that gathers up people randomly: i.e. that does not give the possibility to the single team-member to choose its own team) and from the other hand an individual one (which instead implies the possibility to create a team, and hence to choose which team members to admit). In the empirical case, the former is a competition among the different neighbourhoods within

the same city, while the latter is a competition in which a prize is awarded to a single (very small in number) team of self-selected citizens, that choose to group up and to join the challenge. There are reasons to believe that this two archetypes of challenges may create different incentives and thus have very different effects on the enforcement of the social norms they aim to spread. In order to analyse the differences between this two kinds of competition, we are going to analyse and study the case of Napoli, Italy. Indeed, in this city in southern Italy there have been in a short time span two different attempts of improving desirable recycling behaviour through the spreading of a social norm based policy. As a matter of facts, Napoli has been the theatre of two distinct challenges: the city has been one of the host of the *Cartoniadi*, a competition among all the different neighbourhoods (*Municipalità*) of the city aimed to improve the rate of paper and cardboard recycling, with a prize awarded to the neighbourhood that improved the most its recycling rate; and Napoli has also hosted *Carta al Tesoro*, a treasure hunt-style competition among teams of self-selected citizens (they choose how and with whom to group up), which also has the objective to improve the awareness within the citizenship about the recycling of paper and cardboard. By studying the different effects on the recycling behaviour of those two policies, it is possible to discriminate and assess the effects of collectives and individual challenges on the enforcement of social norms through soft nudges and incentives aimed to spread a desirable social norm.

The rest of the work is organized as follows: the next section reviews the literature, section three models the differences between collective and individual incentives, section four describes the case studied, in the city of Napoli, while section five analyse the effects of the challenges and section six concludes.

2. LITERATURE REVIEW

Starting from economic theory (Elster, 1989), in last thirty years the scientific literature about social norms, nudges and the best policies to implement it has grown very much (Berkowitz, 2004; Decqueq, 2009).

A complete review of the literature on those themes is beyond the scopes of this work. We can re-conduct this literature to the pioneering work on alcohol use of students of Perkins and Berkowitz (Perkins and Berkowitz, 1986), whose framework has been used also to study other undesirable behaviours, such has tobacco use (Haines, Barker & Rice, 2003), seat-belt usage (Perkins and Linkenbach, 2004) and sexual assault (White, Williams and Cho, 2003).

Social norms approach has been defined as a theory of human behaviour (Bicchieri, 2005), that has important implications for health promotion and prevention. More recently, there has been consensus in favour of the term “social norms theory” to describe the underlying theory and “the social norms approach” to describe interventions based on the theory (Berkowitz, 2004). According to this distinction, both the fields are of our interest in this work, since we provide a simple theoretical model and also some analysis of the effects and policy advise.

Deeply embedded in theoretical debate stimulated by critical neo-institutionalism (Bates, 1988; North Halle et al., 1996) on the relationship between norms and informal institutions in public choices

(Sunstein, 1996; Ostrom, 2000; Bicchieri, 2005), the discussion about social norm effects or implications also reached a growing space in areas of social choice relevant for public sector action (Huang et al., 1994; Cialdini et al., 2006; Tankard et al., 2016), policy implementation (Woolcock, 1998) or collective action (Sethi et al., 1996; Pillutla et al., 1999).

Also considered as “a rule governing an individual's behaviour that third parties other than state agents diffusely enforce by means of social sanction” (Ellickson, 2001), the role of social norms especially in improving pro-environment or pro-recycling policies reached an important space in literature, both on empirical and theoretical side (Stern, 2000; Shultz et al., 2007; Shove, 2010; Kinzig et al., 2013; Cecere et al., 2014; Czajkowski et al., 2015; Yang et al., 2018).

In behavioural sciences, social norms typically refer to “the beliefs that individuals hold about what the majority of other people do or approve of doing” (Schultz et al., 2016). According to the theory of planned behaviour (Ajzen, 1991), the three core determinants of people intentions to behave in a specific way are subjective beliefs of social norms, attitudes and perceived behavioural control. Thus a change in individuals' subjective beliefs of social norms may lead to a change in their behaviours.

As already briefly explained, this work aims to describe a quasi-experimental setting for studying the effects of two different “social norm” approaches in the field of recycling. That is the reason why also the literature on waste recycling, which has been intersected with the social norms theory much more recently, is important to our scopes.

Goldstein et al. (2008) studied the use of social norms to motivate and spread more ecological behaviour in hotels. They find out that appeals employing descriptive norms, such as “the majority of guests reuse their towels”, were better than traditional appeal (mainly focused on environmental protection). This is interesting for us because recall the idea of gregarious spirit and group challenge over personal behaviour, even if in a slightly different framework.

Kinzig et al (2013) provide a framework to show the superiority, in terms of results, of an approach based on the spreading of social norms over one based upon the implementation of rules and law.

Of special interest for our work is Cecere et al (2014). The work examines if extrinsic motivation (such as social norms) or intrinsic motivations (such as altruistic behaviour) affect more the individual behaviour towards waste reduction, conducting an analysis on a survey with a sample of about twenty thousand citizens from all over the European Union. The specific focus is on food (leftover) recycling. Results highlight how the behaviour mainly depends on intrinsic motivations.

Finally, Czajkowski et al. (2015) considers the role which selfish, moral and social incentives and pressures play in explaining the extent to which stated choices over pro-environment behaviours vary across individuals. They conduct an empirical analysis over households in Poland, finding that people prefer to sort their waste at home rather than in a central sorting facility. To our scope is interesting that this preference is associated with a moral or intrinsic motivation, involving a belief that sorting at home is more thorough than a central sorting.

This work contributes to the literature analysing the different effect on the spreading and enforcement of a social norm between two kinds of policies: the one promoting a collective incentive, with lower

personal effort, possibility of free riding and possibly lower personal gains, versus the policies promoting individual incentives, with greater personal effort, no possibility of free riding and bigger personal gains.

3. COLLECTIVE AND INDIVIDUAL INCENTIVES

It is possible to distinguish the nudges that aim to enforce a social norm and try to make it widely adopted into two main, big families. There are the actions that try to implement a desirable behaviour through the institution of some collective incentives from one hand, and on the other hand the ones that offer as a reward an individual incentive. If we define social norms as “the beliefs that individuals hold about what the majority of other people do or approve of doing” (Schultz et al., 2016), according to the theory of planned behaviour (Ajzen, 1991), a change in individuals’ subjective beliefs of social norms may lead to a change in their behaviours, since it is going to change one of the three pillars of the planned behaviour.

In theory, both this approaches have some typical pro and cons, and hence it is hard to say which one has the best effects and is preferable over the other. Indeed, it is arguable that people can have bigger incentives by running for an individual perk, rather than from collective benefits, since from the former they get bigger benefits and hence a greater utility. But on the other hand, another argument can claim that collective incentives aim to a bigger audience, and may have a bigger effect for this reason: more people involved can mean a bigger spread of the norm, and hence greater final effects. In other terms, from the former approach we have presumably a smaller set of individuals affected by the nudge, but with stronger incentives to behave accordingly to the social norm; from the latter, on the other hand, we should expect a larger set of people affected by a smaller, almost intangible, incentive to conform to the social norm. Furthermore, people’s identities can be influenced by the behaviour of those around them (Bem, 1967), thus also this should be taken in account: more people involved can affect more people simply for a mimic effect, while on the other hand very motivated people can “proselytize” and spread the social norm more effectively.

As already sketched, there are reasons to believe that both these systems can lead to the best results, since (to simplify) one aims to increase the base to pursue a desirable social norm, while the other aims to give stronger incentives to individuals, that can become promoter of the social norm and spread it in their communities.

In formal terms, the beneficial effect of a policy aimed to spread a desirable social norm is

$$y = \alpha + \beta_1 P + \beta_2 E + \beta_3 PES + \varepsilon$$

Where y is the beneficial effects due to the implementing and spreading of the social norm, P is the amount of people that adopt it, S is the spreading of the social norm that the people manage to create (which interacts with the amount of people spreading it and the effort people invest into it), and E is the effort with them pursue the norm.

While we expect collective challenges to increase P and thus on S through this interaction, individual challenges should have an impact on E , and thus on S through this channel.

Of course, it is not possible through this formalization to say which challenge is going to have the most beneficial effect, since all depends on β_1 and β_2 (the impact of P and E on y), plus their indirect effect through S .

4. CASE HISTORY

In order to study the different effects of this two kind of challenges, we choose to focus on the city of Napoli and on cardboard and paper recycling. Indeed, we think that it is a very interesting case study, also because of its story of very poor waste collecting (and waste recycling) policies. The first Extraordinary Commissioner to the Waste Emergency (*Commissario Straordinario della emergenza rifiuti*) has been Umberto Improta, nominated with Ordinance 137 of March the 31st 1994. After that, there have been many Commissary and commissions, emergencies and policies to try to solve the situation, which indeed finally improved, among international scandals and extraordinary efforts from the local and central government.

Lately Napoli has adopted a recycling policy, with a door to door waste-recycle gathering in almost all its neighbourhood (flat served by door to door gathering, increased from 87,000 in 2008, to 417,000 in 2017, an increase of 479% in ten years, according to the ASIA Report 2018).

The recycling of paper and cardboard is very interesting to study the effect of policy trying to enforce social norms, since it is one of the recycling that requires less effort for the citizen, both in order to keep the waste and to select it properly. Furthermore, is a kind of waste that it is unlikely to be affected by calendar effects or other temporal effects (and in any case the months of the two challenges are close and similar in terms of possible calendar effects).

More interesting to our scopes, Napoli has been in 2012 part of *Cartoniadi*, a challenge organized by COMIECO¹, CONAI², City of Napoli and ASIA³. Objective of this competition, among the ten different neighbourhoods (*Municipalità*) of the city, is to increase the actual rate of recycling within them. The neighbourhood that increase the most its rate, wins a prize of 50,000 euros. Those moneys are awarded to the local neighbourhood government, to requalify an area within its territory, such as a public park. This is a kind of challenge in which there is a spread responsibility and a spread prize, thus the incentive to adopt the social norm are not so strong for the single citizen. There is a strong possibility of free riding of course, enjoying the benefit of a re-qualified public good without making the effort during the challenge. On the other hand, we expect that the participation is more spread, since local stakeholder,

1 COMIECO (*Consorzio Nazionale Recupero e Riciclo degli Imballaggi a base Cellulosica*) is an Italian consortium of producers of paper and cardboard wrappings, that manage the system of gathering, recycling and recover of paper and cardboard wrapping; this mission it's financed by CONAI (*Consorzio Nazionale Imballaggi*).

2 CONAI (*Consorzio Nazionale Imballaggi*) the Italian consortium of wrapping.

3 ASIA (*Azienda Servizi Igiene Ambientale*) it is the City of Napoli public company that has the mission to work for the gathering and disposal of the garbage and waste all over the territory of the city.

societies, politicians and other activist have an incentive into spreading to word and try to have their neighbourhood to win the challenge. Also of interest for our study, is that the main institutional stakeholder interested (i.e. the neighbourhood local government, the *Municipalità*) has a very strong incentive into spreading the word and promote the social norms and more generally a proper behaviour among its citizens. Indeed, the local governments are in competitions one with the other, and all the local Public Administration and the local government have an incentive into being the best recycler and winning the prize, both for the prize itself, that allows them to requalify an area on their territory, and for the less tangible but possibly most interesting incentives for the local government and politicians, such as the popularity due to the event, the media coverage that such a peculiar challenges guarantees, the consequent possible increase in public consensus, and so ahead, and so forth.

The other event hosted in Napoli has been *Carta al Tesoro*. This happened in 2018, and was organised by COMIECO, ASIA and City of Napoli. It is a treasure hunt-style challenge, that has the objective to increase awareness among the citizenship about the recycling of paper and cardboard. It is the main event of a month dedicated to this topic. The challenge is open to teams, composed of citizens of any age and from any neighbourhood of the city. It is a path all over the city with a series of games, enigmas and puzzles about, or anyhow in theme with, recycling of paper and cardboard. The prizes for the first three teams of the leader board at the end of the challenge are supermarket vouchers of respectively 1,500, 1,000 and 500 euros. We expect this kind of challenge to motivate more the single citizens, since the prize is way more tangible then the other and there is no risk of free riding. We could also argue that the short term utility for the single participant is higher in this second case. At the same time, we expect from this kind of challenges to have less participation, since the circulation of the news is possibly smaller due to the lack of a neighbourhood effect. There is also a lower incentive for the main institutional stakeholder (that in this case we expect to be the City of Napoli, since the single neighbourhoods are not actively involved as in the other case), since there is no competition with others institutional stakeholders, there is no direct, tangible benefit for the local (city level) government and nor for the public administration, and in general less non tangible incentives for the politicians, in terms of visibility and media coverages.

We consider the policies implemented by this two events comparable, since both are focused on the same topic (recycling) and furthermore on the same kind of recycling (paper and cardboard). But there is more: the set of organizer is pretty much the same (CONAI was involved in *Cartoniadi*, and not in *Carta al Tesoro*, but it's a consortium very close and related to COMIECO, thus we do not expect any significant difference from its absence in the second set of organizers). Of course the set of non-institutional stakeholder is the same, since are hosted in the same city, and the time span is not that different to suspect that there are other, underling, variables involved influencing the effect.

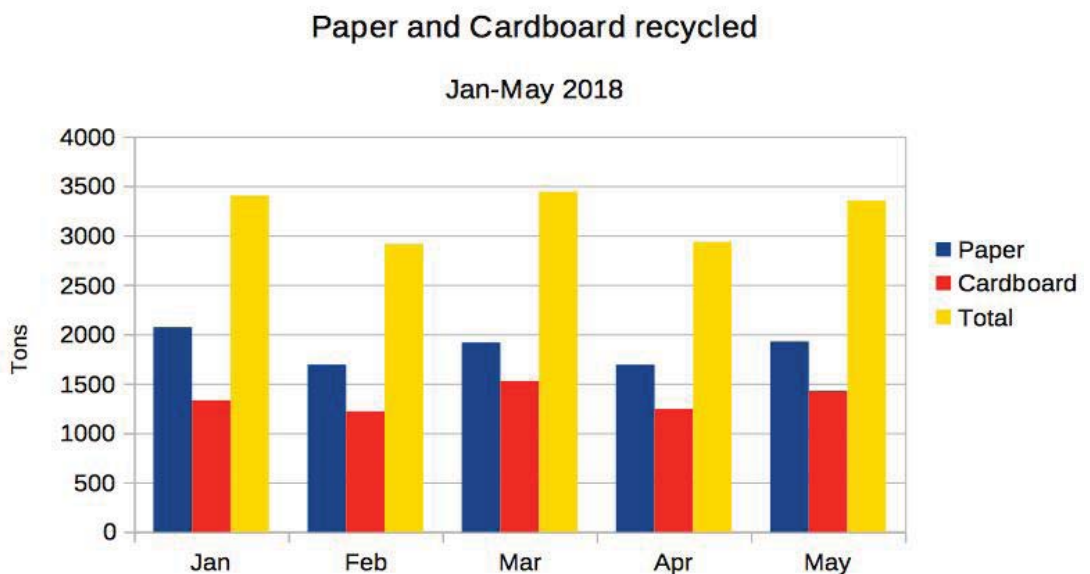
Please also notice that the size of the events is widely comparable. Indeed, if one can argue that *Cartoniadi* is a larger program then *Carta al Tesoro* (*Cartoniadi* had a prize of 50,000 euro versus the 3,000 of *Carta al Tesoro*), to the individual the incentive is stronger in the "smaller" program, rather than in the big one. Indeed, the prize of *Cartoniadi* is to be spend in a neighbourhood (in Napoli each has around 100,000 inhabitants) and the utility gain for the single citizen of the neighbourhood can be

assumed to be lower than the other prize (we do not want to simply divide 50,000 euro for the amount of citizens within a neighbourhood, since the perceived value of a restored park close to home is hardly equal for the citizen to the strict economic value: by any chance it is hard to consider it to be greater than a liquid economic prize, which complete put on prize is equal to three times the average monthly wage in Napoli).

Hence, for all this reasons, we consider that this two events are comparable, and thus an interesting quasi-experimental setting to compare and study the effects of those on paper and cardboard recycling.

5. THE EFFECTS OF THE CHALLENGES ON RECYCLING

In 2018 the *Cartoniadi* have taken place in the month of March, thus we are starting our analysis on the effect by using this month as a threshold to have a before and after effect. The tons of paper and cardboard gathered in the month of March are respectively 1915 and 1526, for a total of 3441; in April the tons gathered have been 1691 and 1243, for a total of 2934 (ASIA, Report 2018). Apparently, at a first glance there has been no positive effect of Carta al Tesoro on the paper and cardboard recycling, with -507 tons net effect on the recycling, almost 15 percent less (and both on paper and on cardboard the effect is negative). If we look at the two months before and after (unfortunately the last data are about May 2018, so it's not possible to further analyse the effect) the totals becomes 6352 and 6285, with a less strong but still negative effect of 67 tons (about 1 percent). All this suggest that Carta al Tesoro has not had any positive effect on the recycling of paper and cardboard.



Instead, if we look at the 2012, the data (COMIECO, Press Release of July the 6th 2012) tell that the increment in June (the month of the competition) was all over the city of 3.25%. Furthermore, nine neighbourhoods out of ten were classified in the first level for quality of the gathering (an index

discriminating among the quality of gathering, i.e. how many mistakes the citizens did in differentiating the recycling). Even more impressive, is that in the month of June the winning neighbourhood (which, for the record, was the X neighbourhood, *Decima Municipalità*) manage to increase its recycle of paper and cardboard of 33%.

<i>Challenge</i>	<i>Improvement in paper and cardboard recycling</i>
Cartoniadi	-14.73%
Carta al tesoro	+3.25%

In other term, this case of study suggests that the benefit of a greater individual incentive do not cause as an outcome a better recycling rate. Following our model, P and S , which we expect to have coefficient with a greater magnitude in the case of *Carta al Tesoro* (since it is a program having as object communities rather than individuals) seems to be more important than E (a variable we may expect to have greater important in programs focusing on individuals, at least since the lack of possibility of free-riding). This of course, if confirmed by other empirical analysis, is potentially a very interesting findings for the policy maker that has to choose how to allocate resources to nudge towards certain behaviours and implement desirable social norms.

6. CONCLUSIONS AND FURTHER STUDIES

This preliminary analysis suggests that challenges which have a collective group and award a prize to a big neighbourhood have a stronger effect to enforce a desirable social norm into a community, if compared to an individual challenge, awarding a prize to a single group of self-selected citizens. Considering the possibilities in terms of policymaking, this finding has interesting implications.

The first, immediate consequence, is that aiming the policy to a larger group of people, and potentially involving the stakeholders, has a stronger effect than awarding a more concrete, without the free riding problem, prize. Thus resources should be addressed accordingly.

Another implication is that the competition among institutional stakeholders has a positive effect on the implementation and spreading of a social norm, since as argued the *Cartoniadi* also involved a certain degree of competition among the different local neighbourhood governments, while for *Carta al Tesoro* this level of competition and incentive lacks, thus the main institutional stakeholder in that case is the town hall of Napoli itself, without any real competitor. Even if one can argue that different *Carta al Tesoro* have been held in different cities over the years, it is hard to assume that this has any impact on the effort the City would put in the challenge, since those other town halls are not in direct competition one with the other.

Further, future studies to continue the research into this field, can address the same topic in different cities, to strengthen and generalize even more the results, or apply the same framework to different kinds of recycling, to see if it is coherent with this finding. Evermore, over the last few decades, several studies investigated the efficiency and effectiveness of inducing behavioural changes, with

disappointing finding for long-run effects. Indeed, rewards tend to have short-term effects only, for as long as the reward is in place (Steg and Vlek, 2009). Thus, extending this preliminary study on the short-term effects of incentives on recycling behaviours to long-run effects, as soon as new data will be available, can be another interesting direction of future researches.

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