

Social Norms with Punishment and Environmental Policy*

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Abstract

In this article I explain social norms with punishment mostly from an economist's perspective, how they emerge and how they diffuse through society. I then investigate the particular role that these social norms play for the environment, looking at both the theoretical literature as well as the empirical results. Following that I discuss the reasons for which governmental intervention is necessary when it comes to dealing with social norms and the environment. I also place emphasis on the steps that policy makers need to take in order to internalize both the externalities from the collective action problem, and also those from the social norm. In addition, I discuss research gaps and provide suggestions for researchers that are interested in dealing with the joint study of collective action problems and social norms.

Keywords: collective action problems; social norms; environment; policy.

JEL codes: H23; Q50; Q58.

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1 Introduction

Social norms are the bedrock, or as [Elster \(1989b\)](#) noted, the cement of our society. They influence many of our choices and our actions. In the absence of public policy, they are a welcomed means to deal with externalities and institutional failures, especially in case of environmental problems. They help solve Prisoner's Dilemmas and aid us in coordinating on the best equilibria of cooperation problems. And yet, while they sometimes provide an immediate solution, they also sometimes create more problems than they solve, especially when social norms do not evolve due to an inherent need, but simply for arbitrary reasons. In that case, they may lead to sub-optimal equilibria.

Social norms can help to internalize some of the externalities that we, for example, face in environmental problems, but, as norms arise from social interactions themselves, they often cannot fully internalize the externalities. For this reason it is useful to rely on public policy in order to bring society closer to the first best solution by carefully addressing both the collective action problem and its interplay with the social norm. In this article I provide an overview of some of the generally accepted views of social norms, how they emerge and how they diffuse through society. In particular, I focus on social norms with punishment. I then discuss the role of social norms for the environment, both from a theoretical as well as an empirical perspective. I follow this up with a discussion of what government policies need to take care of when they try to address both environmental collective action problems and the social norms that are relevant in these cases. In addition, I discuss what are current research gaps and suggest future research directions for the interplay between social norms, the environment and public policy.

[Elster \(1989c\)](#) and [Binmore & Samuelson \(1994\)](#) characterize the homo oeconomicus as someone who is guided by instrumental rationality and should be viewed as an atom in the vast sea of markets, as someone who tends to be on the lookout for the best opportunities. In contrast, the homo sociologicus is someone who is guided by social norms and mindlessly follows these. The individuals that I have in mind here are a mix between these two.

They are assumed to follow rational, economic choices, but they are also being subjected to social norms. A homo oeconomicus will eat meat at home, but if he goes out with his vegetarian friends, then he will become a homo sociologicus and also adopt a vegetarian diet.¹ It is also possible that a homo oeconomicus may like meat too much and feels that the social disapproval from his friends is not enough to stop him from eating meat even if they are around. Individuals are, therefore, affected by the social norm through peer pressure or potential social sanctions, but whether they finally follow a social norm then depends on many additional criteria, such as the extent of the social pressure, the individual's preferences, the benefit from not adhering to the social norm, or possibly also the individual's expectations about what others think about him or what others would do in this situation. As the extend to which social norms protrude through society often changes over time, it is also entirely possible that an individual who does not adhere to a social norm today may be inclined to follow it tomorrow, and vice versa. Social norm dynamics play, therefore, an important role for environmental problems, which themselves also often have a dynamic dimension, such as climate change, or the evolution of biodiversity.

It is impossible to discuss the immense literature on social norms in one article, and what you will find here is a very selective reading. If you would like to get into further details, then a meta-analysis of social norms can be found in [Legros & Cislighi \(2020\)](#). [Bicchieri \(2006\)](#) and [Bicchieri \(2016\)](#) give an in-depth introduction and discussion of social norms. She defines norms based on expectations about other people's behavior and what others believe ought to be done in specific circumstances, and explains norms using game theoretical approaches and experimental and anecdotal evidence. [Elster \(1989a\)](#) introduces various kinds of norms and emphasizes the role of sanctions and punishment for social norms. [Cook & Hardin \(2001\)](#) discuss norms from the perspective of sociologists, economists and legal scholars, and also provide empirical examples and discussions. [Young \(2015\)](#) provides a particularly good review of the evolution of social norms. A discussion of how social norms

¹[Hallman & Spiro \(2022\)](#) have called this hypocrisy and developed a model building upon [Bernheim \(1994\)](#).

can be measured using experiments is given in [Camerer & Fehr \(2004\)](#). A survey on social norms and pro-environmental behavior is [Farrow et al. \(2017\)](#) and [Carattini et al. \(2020\)](#) for issues of cooperation in global commons with particular emphasis on climate issues. [Postlewaite \(2011\)](#) discusses the role of social norms for reduced-form preferences and deep preferences. [Videras \(2013\)](#) provides a discussion of social networks applied to environmental economics. A closely linked area of study is that of behavioral economics, which [Carlsson & Johansson-Stenman \(2012\)](#) survey in relation to environmental policy. Karine Nyborg has surveyed and extensively written on the interaction between the environment, environmental policy and social norms, each of her papers being a little jewel ([Nyborg, 2003](#); [Nyborg et al., 2016](#); [Nyborg, 2018, 2020](#)). The current article is most closely aligned with Nyborg's papers, but emphasises more the policy part and the externalities, the research gaps and the challenges for researchers.

In section [2](#) I review social norms in general and focus on their emergence and their diffusion. In section [3](#) I then discuss the role of social norms for the environment, both from a theoretical as well as an empirical perspective. I then follow this up in section [4](#) and identify what policy makers need to do in order to alter social norms to deal with environmental problems, and especially focusing on the interplay between social norms and the environment. I also discuss research gaps and prospective challenges for researchers. Finally, in section [5](#) I conclude with some further observations and implications.

2 Understanding social norms

This section focuses on an overview of social norms in economics. I define social norms and discuss how they emerge while giving some prominent examples. Then I discuss how social norms diffuse and what are the relevant crucial elements.

2.1 Defining social norms

Social norms have been defined in a variety of ways,² but there are several aspects that tend to be common to all the definitions. The first aspect is that a social norm is a *pattern of behavior that is shared within a group*. The pattern of behavior here refers to the norm, and the fact that it is shared within a group gives it the social aspect. For example, if a social group decides to abstain from eating meat, then ‘not eating meat’ becomes a socially-common behavior, a behavior that is common to that particular group.

The second aspect common to social norms, which distinguishes these from other norms such as moral norms or personal norms,³ is that the shared pattern of behavior needs to be *socially enforced*, and thus requires a certain degree of social interaction within a group (Hawkins et al., 2019). It is this interaction that, through one or another mechanism, enforces social norms. Hence, if the above-mentioned socially-common behavior of ‘not eating meat’ is also socially enforced, then it becomes a social norm.

An action will only be shared within a group and socially enforced if a group also approves of it. Similarly, if a group disapproves of an action, and individuals are subjected to social

²Definitions are, for example, “a predominant behavioral pattern within a group, supported by a shared understanding of acceptable actions and sustained through social interactions within that group” (Nyborg et al., 2006). Another definition is due to Nolan (2017) who describes social norms as “rules and standards that are understood by members of a group, and that guide morally relevant social behavior by way of social sanctions, instead of the force of laws.” The Merriam-Webster dictionary (<https://www.merriam-webster.com/dictionary/norm>) defines a norm as “a principle of right action binding upon the members of a group and serving to guide, control, or regulate proper and acceptable behavior.” Our definition here is slightly weaker in that the actions are not necessarily binding, but, as we shall argue, subject to rational, cost-benefit evaluations. Bicchieri (2006) defines a social norm as “a rule of behavior such that individuals prefer to conform to it on condition that they believe that (a) most people in their reference network conform to it (empirical expectation), and (b) that most people in their reference network believe they ought to conform to it (normative expectation).” Fehr & Gächter (2000) define a social norm as “a behavioral regularity that is based on a socially shared belief of how one ought to behave, which triggers the enforcement of the prescribed behavior by informal social sanctions”. Another definition is by Ellickson (2001), who defines social norms as “a rule governing an individual’s behavior that third parties other than state agents diffusely enforce by means of social sanction”. Apart from Bicchieri (2006), the common denominator seems to be that social norms are common behaviors within a group that are enforced by social sanctions.

³Moral norms, in contrast to social norms, are internally enforced. One adheres to these norms irrespective of what others are doing. There is also the possibility that social norms become moral norms if individuals internalize the norm (Woersdorfer, 2010), or that social norms are written down in the form of a law (Posner, 2009). While a law might derive from a social norm, once it is written down and government regulation takes care of the enforcement, then it is not a social norm any longer.

pressure, then a social norm emerged that disincentives that action. Social approval or disapproval can arise from essentially two channels. The first channel is second or third-party sanctioning, which suggests that someone else sanctions the individual that is not adhering to a social norm. A key attribute here is that the actions associated with the social norm should be visible, they should be observable. This observability gives the norm its social character. An action that is not observable can hardly be socially enforced by someone else, so it is very likely that no externally-enforced social norm will develop in this case. The second channel rests on the observation that social disapproval need not necessarily be an action by others. Even a person's belief that others do not approve of one's behavior can be enough to feel social disapproval (Loewenstein, 2000; Rege, 2004). Thus, sanctions can come from someone else or from one's own beliefs about what others approve or disapprove.

Sanctions are often viewed as the predominant means to enforce social norms (Nyborg et al., 2016; Nolan, 2017), but there are additional mechanism such as coordination (Posner, 2009), the wish for social status or to be accepted by others (McAdams, 1997), the feeling that a specific action or outcome is socially desirable or important (Green, 2006), or copying the behavior of others (Young, 2015; Lapinski & Rimal, 2005). Returning to our example from above, if our aforementioned social group stops eating meat because each member feels that others would disapprove of eating meat, or because each member feels that it is in the interest of the group to do so, then this would meet our criteria for a social norm. In contrast, if the group members individually feel that it is bad to kill animals simply for the pleasure of food then this is not a social norm but e.g. a moral norm, one that comes from an internal mechanism and not through social interaction.

Examples of social norms are given by Elster (1989c) and include, among others, cultural norms, such as dressing and behavioral guidelines, where individuals conform in order to avoid social penalties (G. A. Akerlof, 1980); norms against behavior that conflicts with what society views as natural, such as cannibalism or sodomy; norms that describe the acceptable behavior in case of reciprocity or retribution; norms of cooperation describing how one ought

to cooperate in specific situations; and social norms related to distributional outcomes⁴, for example fairness, equality but also reward. In this case, we want to signal that we belong to the group that undertakes prosocial actions (Bernheim, 1994) or we want to obtain social status (Pesendorfer, 1995; Becker, 1974). The latter two types of social norms, namely cooperation and distribution, are those that we view as most relevant when it comes to the environment and the conservation of nature.

There is no accepted threshold for how far a specific behavioral pattern should extend throughout a group in order for it to become a social norm. Here we shall simply argue that it is enough for a social norm if at least two individuals share a specific pattern of behavior. For example, a husband and wife's arrangement of household chores would, according to the above definition, meet the definition of a social norm. However, for policy purposes, and in the case of nature conservation or collective action problems, the interesting case consists obviously of social norms that protrude deeply through society. An important question, one that we will address in a subsequent section, is then also how norms can spread and influence society as a whole.

I take the position here that adhering to a social norm is an inherently rational decision.⁵ Individuals trade off the benefit and costs from adhering to a social norm. In the case that a husband and wife have the arrangement that they share the household chores but one of the two does not want to do his or her part, then the significant disapproval from the partner may make him or her reconsider. On the other hand, if there is little disapproval, then it is likely that at least one of the partners will try to avoid the costs associated with the household work. The social norm of splitting up the household chores is, if both are in agreement, likely welfare-improving and potentially maximizes the partners' utility.

While some social norms can be beneficial to society, for example, if we think about

⁴Empirical evidence supports the social norm of fairness in many experimental settings, such as Ultimatum Games (Güth et al., 1982; Thaler, 1988).

⁵There is some evidence that individuals may be unconsciously influenced by a social norm, see e.g. Barth et al. (2016) or Nolan et al. (2008). While this may apply in some cases, the fact that social norms need to be enforced via sanctions immediately implies that a rational process must be underlying the choice of adhering to a social norm.

social norms that address distributional or fairness issues, this is certainly not the case for all norms. The fact that adhering to a social norm is a rational decision also implies that social norms are not necessarily welfare-improving, especially in the case of collective action problems. This contrasts with the more traditional view that social norms tend to arise in order to prevent market failures or reduce social costs (Arrow, 1970; G. Akerlof, 1976; Thibaut & Kelley, 2017). For example, the social norm of meat eating, the caste system in India, or the custom of foot binding in China or Japan, cannot easily be argued to be Pareto-improving.

As individuals choose rationally and are faced with social norms that differ in their costs and benefits, this implies that the importance of these norms for society may differ significantly. Consequently, there are various ways in which social norms are further institutionalized. For example, if you are not politely greeted you might feel annoyed and show your disapproval, but there tend to be no further consequences. The sociologist William Sumner (Sumner, 2007) called this kind of social norm a folkway, a custom or convention that should be followed. ‘Thou shalt not commit adultery’ is a social norm that bears much stronger social consequences, and tends to go along with some forms of punishment (mostly by the misled partner). These social norms are called mores. ‘Thou shalt not kill’ is a social norm that, if not adhered to, has severe social consequences and thus a level of punishment that far exceeds that of adultery. These kinds of social norms are, thus, often inscribed into a law. Society feels that the punishment for not adhering to this social norm deserves to be extensive, as the consequences of not acting according to this norm can be significant.⁶

In the language of economists, the benefits and costs of these norms vary, and, therefore, also the way the norm is institutionalized. Roughly speaking, one can distinguish between informal and formal institutions. Informal institutions tend to be put in place for social norms that fall into the category of folkways, while formal institutions are usually developed for social norms that have significant impacts for society, and therefore tend to be written

⁶Obviously, once the social norm is enforced via regulation, then, strictly speaking, it is no longer a social norm.

down in the form of laws. In the following we will only deal with informal institutions.⁷

2.2 The emergence of a social norm

The general presumption is that social norms come into existence because they fulfill a specific function in society (Bendor & Swistak, 2001). For example, Arrow (1970) suggested that social norms are institutions that exist to correct or compensate for failure or limitation of the market. Social norms often evolve as an alternative to government interventions or laws (Posner, 2009), or when institutional failures require further solutions to handle particular problems.⁸ These norms also, potentially, help to internalize externalities. A simple example is that of a typical Prisoner's Dilemma. Assume two thieves, Mr Bad and Mr Worse, are caught by the police and the usual interrogation starts that leads up to the well-known Prisoner's Dilemma. The dominant strategy is that both snitch on each other and end up longest in prison, whereas a Pareto-dominating equilibrium (at least for the two thieves) is that nobody talks and consequently both walk. Assume now that a social norm exists among thieves which says: If you talk then our gang members will punish you severely when they get the chance. This changes the payoffs of the original Prisoner's Dilemma, and thus also the dominant strategy. If the prospective punishment is severe enough, then neither of the two thieves will have an incentive to talk.

Thus, social norms are able to change the equilibria of games, or, in other words, they are able to help members of a group obtain Pareto-improving outcomes. A downside is that social norms, as in the example above, may only benefit a sub-population of a group. One likely explanation is that the gang of thieves figured out that their members would snitch upon each other unless the prospect of an even more severe punishment changes those

⁷For those readers who would like to deepen their knowledge on informal versus formal institutions, I suggest to look at Arrow (1970), Ostrom (1990), Brady (1993) or Beddoe et al. (2009).

⁸Stutzer & Lalive (2004) find that the social norm 'to work' has significant impacts on the happiness when unemployed and also on the duration of unemployment. Those who are unemployed are sanctioned by social pressure from other members of their community and thus want to get back into work faster. There are, of course, many examples along these lines, such as fertility norms (P. S. Dasgupta & Ehrlich, 2013; Barrett et al., 2020), land and caste systems (G. Akerlof, 1976), to name but a few.

incentives. Thomas Schelling called this the property of prominence, which leads to specific behavioral patterns that are used to coordinate among members of a social group. Using this interpretation, a social norm then emerges in order to solve a particular coordination or belief problem, or problems of the kind of Prisoner's Dilemmas (Edna, 1977). Prisoner's Dilemmas have one unique Nash equilibrium, while coordination games usually have multiple equilibria. A social norm will then change the payoffs in the Prisoner's Dilemma so that players find it optimal to choose a specific Nash equilibrium. In the case of a coordination game, a social norm adjusts the expectations so that players expect everyone else to choose a particular equilibrium which in turn helps the players to coordinate on the same equilibrium. Hence, a requirement for a successful social norm is that the members of the group share common beliefs about the implementation of the norm. This sharing of common beliefs views norms more as clusters of self-fulfilling expectations (Schelling, 1960), where some expectations may lead to vicious cycles that reinforce them when emerging in society.

However, those are not the only reason for social norms to emerge (Elster, 1989c), and, as already noted above, social norms are not necessarily established, or do not necessarily evolve, in order to lead to Pareto improvements. For example, it is difficult to argue that the tradition of foot binding in China and Japan was really a Pareto-improving social norm. Sugden (1989) supports this view by calling the emergence of a norm a 'spontaneous order', and argued that many norms have evolved from some previous version to the form that we know them today. Recent evidence suggests that social norms may even evolve arbitrarily (Pryor et al., 2019) and simply depend on the degree to which group members self-identify with the group that exhibits the norm. The authors call this the self-categorisation theory of social norms (see also G. A. Akerlof & Kranton (2000) or Cialdini & Goldstein (2004)). According to this view, it is not necessarily the content of a social norm that is important for whether or not a social norm gets established, but what matters most is how important it is for an individual to belong to a specific group. An example that comes to mind is the social group Goths. While originally only about music, this group developed its own particular

clothing norms, the Batcave style, black and white with long hair and white-powdered face. If Mrs Gotham wanted to self-categorise into this social group because of her music taste, then she would also have to adjust to their clothing styles, and possibly follow their more occult ways. What gave rise to this particular clothing style? One possible explanation would be that Goths wanted to be different and wanted to show this. In contrast to our previous case we are here not dealing with coordination for equilibrium selection, but simply with the fact that some individuals obtain utility from belonging to a particular group.

The fact that social norms, in this case of self-categorisation, may emerge somewhat arbitrarily, suggests that social norms are, by no means, necessarily leading to Pareto improvements. For example, we may interpret the social norm of ‘catching up with the Joneses’ as a wasteful norm of signaling status. Mr Porsche drives an expensive car and by so doing signals that he belongs to a particular social class. A more extreme version of this example would be the caste system in India. While it can be argued that members of a particular social class prefer to stay among each others and therefore signal which social class they belong to, it could also be argued that the Indian caste system is an arbitrary norm that only benefits a selective few at the expense of a larger group.

A similar problem arises in social norms of coordination. If one bar is full while the other across the street is empty, this does not mean that Mr Jameson will find the beer, service or music in the empty one worse than in the full one. It might even be that the next day the previously empty bar will be full. The key is simply that individuals, if they coordinate, may sometimes coordinate on bad equilibria (such as an overcrowded bar) because of a social norm. This has been called information cascades ([Bicchieri & Fukui, 1999](#)), where norms can evolve from sometimes arbitrary starting conditions, and history dependence then leads to specific coordination equilibria.

What all of these cases, nevertheless, have in common, is that individuals believe that they maximize their utility when following the social norm. The two thieves believe it is better to follow the social norm of not snitching. Mrs Gotham believes that she will be a

happier person if she self-categorizes in the way of the Goths. Mr Porsche is more satisfied if people believe that he is rich as he enjoys this signal, or he believes that in this case he will be more likely to attract members of the same social class. And Mr Jameson believes that social coordination is able to identify the better bar. Furthermore, he is also more likely to adhere to this social norm as he is unlikely to test this by also going to the other bar.

Thus, the key for the emergence of a successful social norm is that people believe that adhering to a particular action or behavioral pattern increases their utility. This is where evolutionary game theory helps to understand why a particular norm is successful and emerges in society, while another may vanish. [Sugden \(1989\)](#) shows that social norms are useful to select among equilibria, but that they need some form of enforcement as otherwise it would not be optimal to adhere to a social norm. This enforcement can be in the form of punishment from other group members or even third parties, but it can also come from common beliefs.

[Bicchieri \(2006, 2016\)](#) extensively studies social norms and argues that individuals are more likely to adhere to a social norm if most people are expected to conform to it, and also that most people believe that others will conform to it, too. [Young \(2015\)](#) calls this a self-enforcing behavior at the group level. In this respect, [Bicchieri \(2006\)](#) suggests to distinguish between empirical and normative expectations. Empirical expectations (also called descriptive expectations) are those that tell us about the expected behavior of others, while normative expectations (also called injunctive expectations) are those that inform us about what other people feel ought to be done in a specific situation. Expectations influence behavior, especially in a social environment. If I believe that others expect me to hold the door open for women, then this is a normative expectation and it is likely impacting my decisions. If I believe that nobody else is holding the door open despite the normative expectation, then this could also affect my decision to neglect this social norm.

One should not underestimate the importance of why a certain social norm comes into place, as this is crucial to understand the dynamics of the norm (we will turn to this in the

next section), but also to understand how this particular norm can be challenged, adjusted or improved. This, thus, is a crucial key component for policy making. If someone adheres to a social norm simply because that person wants to be a member of a particular group, then it is vital to understand who are the key players in that particular group or network.⁹ Instead, if someone adheres to a social norm in the hope of coordinating with others, or because of fairness issues, then the policy should target different mechanisms.

2.3 The diffusion of social norms

Some social norms exist only within a small group, such as the specific arrangements as to how household chores are split up within a family. Other social norms span throughout a large part of society, such as the attitude towards smoking in public. Yet other social norms are accepted within the whole of society, such as how we greet each others. Clearly, social norms differ in the depth with which they protrude through society. Yet if a specific behavioral pattern becomes a social norm, it does not immediately imply that the whole society will adhere to it.

Young (2015) argues that social norms tend to be very persistent. He is certainly right when he refers to the persistence of social norms related to cooperation or distribution. This is because functional social norms, i.e. those that are Pareto-improving, are more likely to stand the test of time compared to other kinds of social norms (e.g. arbitrary ones). For example, social norms such as the ten commandments have now endured for many centuries. It seems obvious that if a social norm benefits society at large, then it is also reasonable to assume that this norm will be followed in the future. It is, however, as always, not that simple. The caste system in India has been established centuries ago, and it continues to be applied by the different castes despite governmental regulation that prohibits discrimination. Foot binding endured in China and Japan for many years, or the tacit acceptance of corruption in many countries (R. Banerjee, 2016). Banfield (1967) describes

⁹There is some evidence supporting the view that leaders obtain reputation from enforcing particular social norms (de Kwaadsteniet et al., 2019; Videras, 2013).

how some social groups (for example in Chiaromonte in Italy) are unable or unwilling to cooperate as they lack trust or social capital, and that these norms continue to hold over the years. Other examples come from gender roles ([Alesina et al., 2013](#)). The authors show that the descendants of societies that traditionally practiced plough agriculture, today have social norms that are built on a larger gender gap. Furthermore, this gender gap also persists across generations if members of these societies migrate to other countries with a lower gender gap.

While earlier economists tended to view social norms as a persistent, often even static, non-changing part of our preferences, there is now a wide-spread agreement that social norms can change and do change ([Bowles, 1998](#)). A classic example comes from a study on UN officials and parking tickets in Manhattan ([Fisman & Miguel, 2007](#)). Diplomatic immunity protected UN diplomats from parking enforcement actions, and thus only social norms related to corruption were dictating their actions. The authors of this study found that diplomats from countries with high corruption were also more likely to accumulate unpaid parking tickets than those from low corruption countries. The behavior changed in the moment that diplomatic immunity did not anymore prevent parking enforcement. Other examples show that there have been significant changes to the social norm of going to church on Sundays, or whether one deems smoking in public a socially acceptable behavior. Church membership of Americans in 1930 was around 70%, while this number has fallen to 47% in 2021 ([Jones, 2021](#)). In 1953 around 50% of the US adults were smokers, while in 2011 only 20% smoked. This trend is reflected in attitudes towards smoking, where the percentage of Americans favouring a ban on smoking in public places increased from 39% in 2001 to 59% in 2011 ([Newport, 2011](#)). In the 1920s, Canada, for example, changed the social norm of driving on the left because they wanted to adapt to the United States, where everyone is supposed to drive on the right. I would, thus, argue that persistence is not necessary for social norms.

It thus seems clear that some social norms persist simply because the fundamentals on which these norms have been built, the cost and benefit trade-offs, have not significantly

changed during the years. As argued above, individuals will only adhere to social norms if it is in their interest to do so. If their cost-benefit calculations change for some reason, then their willingness to adhere to a specific social norm will be altered, too. This is essentially captured by [Linton \(1963\)](#), who notes that culture is (p.466-468) “the sum total of the knowledge, attitudes and habitual behavior patterns shared and transmitted by the members of a particular society... Cultures are adaptive mechanisms and as such represent a response to the needs of our species... Culture change is, at bottom, a matter of change in the knowledge, attitudes and habits of the individuals who compose a society.” Here it is important to acknowledge that social norms are not static but they tend to change over time and across groups. The question then becomes as to how social norms diffuse.

The temporal equilibrium of social norms arises from a Nash game or a coordination game. We argued above that beliefs and fundamentals play a decisive role for the equilibrium that will be selected. If those fundamentals do not change, then it is unlikely that the payoffs that are associated with a specific social norm change, too. In that case we would expect a persistent social norm. However, fundamentals do change, and sometimes we want those fundamentals to change. For example, in the case of smoking, we know that society was in a bad equilibrium as a large share of society smoked and, therefore, smokers were significantly harming their own and others’ health. As a result, governments across the world undertook extensive campaigns to inform citizens of the negative health impacts of smoking, and, in addition, also banned smoking in various public places. Within a short period of time, the number of smokers decreased significantly, and with it the social health costs.

How a social norm then protrudes through society depends on the number of equilibria that exist in the Nash or coordination game that underlies the decisions to adhere to a social norm, and it, furthermore, depends on how the fundamentals in society change. In addition, a decisive criterion is as to how individuals perceive the incentives of others to adhere to a norm (empirical expectations) and how these incentives are related to potential sanctions and punishment. If an individual believes that many other individuals will adhere to the

social norm, then this increases the incentives to adhere through two potential channels. One channel affects the sanctions, in that the more individuals adhere to the norm the more likely will an individual, who does not adhere, be punished. This, obviously, requires a sufficient degree of visibility of the action that is associated with the social norm. The second channel is coordination: the more individuals coordinate on the same equilibrium the more likely will this be the chosen equilibrium in society and the more willing will an individual be to contribute to achieving this equilibrium.

Evolutionary game theory has been widely used to study the diffusion of a social norm. The idea is that more people will adhere to a social norm if the expected payoff from the social norm outweighs that of not adhering to the social norm (Sugden, 1989), in other words the (average) payoff of doing something else (Weibull, 1997). Social norms will be followed by a larger population share if those social norms give more benefits than other actions. Furthermore, individuals are more likely to adhere to a social norm if a larger share of the population adheres to the social norm,¹⁰ as they are more likely to face sanctions (Lindbeck, 1997). This mechanism of norm diffusion has generally been studied using the replicator dynamics (Taylor & Jonker, 1978). The replicator dynamics tend to lead to three potential equilibria for the social norm. A stable equilibrium where nobody adheres to the social norm, an unstable intermediate one, and a stable equilibrium of full compliance.

Following Smith & Price (1973) the resulting equilibria, namely where nobody adheres or everybody adheres, have been called an evolutionarily stable strategy (ESS), which is a strategy that, if followed by a sufficiently large share of the population, nobody wants to deviate from (see also Bendor & Swistak (2001) and Sethi (1996)).¹¹ Hence, every evolutionary stable strategy is a Nash equilibrium, but not every Nash equilibrium is evolutionary stable. For example, the intermediate, unstable temporal equilibrium is not evolutionary stable, as a small deviation by few individuals can lead to the tipping of the social norm

¹⁰A literature that builds upon this is that of cultural transmission, e.g. Bisin & Verdier (1998) and Bisin & Verdier (2001).

¹¹This concept of stability is closely linked to internal stability in coalitions (d'Aspremont et al., 1983).

(Granovetter, 1978; Levin et al., 1998; Xie et al., 2011; Scheffer et al., 2012; Andreoni et al., 2021; Bicchieri, 2016), and the resulting evolutionary stable (or asymptotically stable) equilibrium will be either of the two extreme outcomes. Furthermore, any other temporal Nash equilibrium is also not evolutionary stable.¹² This potential tipping of a social norm can lead to path dependency and lock-in of particular equilibria (Meunier & Schumacher, 2020), which may prevent a social norm from fully developing through society. In this case policy interventions are useful if they can change some of the fundamentals in order to guide the social norm above the tipping point (Rege, 2004; Nyborg, 2018).

A social norm can thus evolve through society not only because fundamentals are changing, but it also evolves due to repeated interactions that affect beliefs about who is adhering to the social norm. This has also been argued by Axelrod & Hamilton (1981), who suggested that cooperation and reciprocity emerge even among strangers if they meet often enough and are likely to meet in the future, too. Conformity to beliefs, and especially conformity to beliefs of others, plays a fundamental role in how social norms diffuse through society.

3 Social norms and the environment

I argued above that social norms emerge in order to select a specific equilibrium, be it in a Prisoner's Dilemma problem, a coordination problem or a distribution problem. At the same time it may also sometimes happen that social norms simply emerge randomly. Social norms may be welfare-improving for the whole population, for only a subset of a population, or they may not be welfare-improving at all, which depends on the equilibrium that the social norm helps to select. Furthermore, social norms may be evolutionary stable, or they are temporary and apply only in the short run. When we consider the particular role of social norms for the environment, then we should be focusing mostly on collective

¹²A slightly weaker concept is the neutrally stable strategy (NSS), which allows a small but stable population that does not adhere to the social norm (Weibull, 1997).

action problems. The reason for this is that environmental problems tend to be public good problems that are subject to externalities, and thus the collective action setting is the key to understanding environmental problems. An important collective action problem is the ‘Tragedy of the Commons’ ([Hardin, 1968](#)). While the commons share the characteristic of being non-excludable with public goods, in contrast to public goods, the commons are rival. This means that consuming a certain amount from the commons leaves less for the rest of society.

It is well known that in a public good setting, self-centered individuals do not contribute to the public good but instead prefer to free ride ([Samuelson, 1954](#); [Andreoni, 1988](#)). This is the standard problem of collective action, where a homo oeconomicus will not contribute to the common good because he views his contribution as being too marginal compared to the costs that he faces. A simple example is commuting, where individuals prefer to commute by car as it is often easier and faster compared to a commute by train, while they consciously neglect their impact on carbon emissions. If an individual stops commuting by car then the impact on climate change will be negligible, while the personal impact on time and effort may be significant. This kind of public good game tends to have only one Nash equilibrium, and it is the zero contribution one. The willingness to contribute to a public good then requires an incentive mechanism that moves society away from the zero contribution equilibrium to one with positive, or even optimal, contributions. This can be achieved via public policy, social norms, or a mix between the two. In this section we are going to look at the role of social norms for collective actions with emphasis on environmental protection, in the next section we study how public policy may affect these norms. The articles presented here contain, by far, not an exhaustive list of the theoretical and empirical work that has been done on this topic. However, I believe they cover the most important major mechanisms that have been studied.

3.1 Theoretical approaches

There exists a variety of articles that theoretically study the role of social norms for public goods, and some with an immediate application to environmental problems.¹³ [Holländer \(1990\)](#) developed one of the first models studying the role of social norms for the provision of a public good and found that, if individuals care about their relative contribution to a public good, then the resulting allocation would only be first-best by chance, and usually second-best. A similar result is due to [Brekke et al. \(2003\)](#), who suppose that individuals compare their contribution to the public good with a contribution that is determined by a social norm. If their contribution falls short of that determined by the social norm then this gives the contributors a disutility, while it increases their utility otherwise. This also does not necessarily lead to the first-best. The reason that the social norms in both cases do not necessarily lead to the first best is that caring about the relative contribution, and comparing one's own contribution to that induced by a norm, may not fully correspond to the allocation that is optimal for all of society. While it may be an improvement on the equilibrium without a social norm (a zero contribution equilibrium), it may still be far from the optimum, and that in both directions. Depending on the strength of the social norm, individuals may still contribute too little, but they may also contribute too much to the public good.

In both of the above models there is a given social norm. [Bruvoll & Nyborg \(2004\)](#) build upon the model of [Brekke et al. \(2003\)](#) and analyze what happens if e.g. the government, via targeted advertising or some public policy, can adjust the importance of the social norm. They find that this may have two impacts. The first impact is that, if others contribute more to the public good due to the stricter social norm, then this will benefit all individuals due to the increase in the public good. The second impact is that an individual will be inclined to increase his own contribution, which is costly, or suffer from a worse social image if he does

¹³For those readers interested in a comparison between altruism, moral and social norms and their respective impacts on the environment, I suggest to take a look at [Nyborg \(2018\)](#).

not contribute more. A slightly more involved model that, however, is in spirit essentially similar, is developed in [Bénabou & Tirole \(2006\)](#). Individuals signal their altruism through contributing to a public good, which is socially rewarding for them.

Taking this a step further, [Rege \(2004\)](#) builds a model where a social norm develops from the interaction with other individuals, and the social norm is that contributors approve of other contributors, while they show disapproval to non-contributors.¹⁴ Thus, the more people contribute the more disapproval do non-contributors get and thus the higher the incentives to contribute, and vice versa. [Rege \(2004\)](#) then allows the social norm to endogenously evolve through society, and for this she relies on the replicator dynamics. The underlying idea is that, if there are few contributors, then the social norm will have little effect as the social approval from contributing is small if individuals meet few contributors who may approve of their actions. Thus, in this case it is actually optimal for individuals to not contribute. This kind of replicator behavior gives rise to the tipping points as discussed above, where eventually society converges to an equilibrium at which everyone is conforming to the social norm or nobody conforms. Only these two equilibria are asymptotically stable. Which of the two equilibria will be approached over time then depends on the initial condition, especially the initial share of contributors in society. If that share is large enough, then the incentives for others to contribute are also high, which in turn raises the incentives for even more people to contribute. The final implication is then that, given a sufficiently large share of initial contributors, over time the contributions to the public good will increase, and finally reach a maximum once the social norm has protruded through all of society. On the converse, it is also possible that, given a small initial share of contributors, eventually nobody contributes, leading to the well-known zero contribution equilibrium.

What these approaches have in common is that they are built on a somewhat black-box setting, insofar as it is assumed that non-contributors will automatically suffer disapproval

¹⁴A similar approach can be found in [Nyborg & Rege \(2003\)](#) who study the social norm of smoking in public places, where accepting smokers in public places gives high social approval for non-smokers, where the approval reduces with how used they are to passive smoking. The model yields similar results and implications as the one in [Rege \(2004\)](#).

from contributors. However, disapproval from contributors is costly, and it is not entirely clear why a contributor would want to penalize a non-contributor. [Sethi & Somanathan \(1996\)](#) developed a model to study precisely this. In a common property resource model, they assume the existence of three groups, defectors that take a larger share of the common property, while cooperators and enforcers take a small share. It is the role of enforcers to sanction defectors. They then also rely on the replicator dynamics to study the endogenous evolution of the share of the three groups in society. One result is that, if the initial share of enforcers is sufficiently small, then over time enforcers will vanish and so will cooperators, as the benefit from being a defector exceeds that of being an enforcer or cooperator, eventually leaving defectors as the only group in society. Another result is that, if there are few defectors, then sanctioning only few is cheap, so it is possible to eliminate defectors. This leaves two potential equilibria, one with defectors only and where the social norm disappears, and one where defectors disappear and the social norm is enforced. The authors then couple the evolution of the group shares with a common property resource stock. They obtain that, if the social norm is strong enough and there are sufficiently many enforcers or sufficiently few defectors, then a sustainable resource stock can be attained. There is, however, no guarantee that this will be close to the maximum sustainable yield.

In the model of [Sethi & Somanathan \(1996\)](#) the resource stock itself has no impact on the dynamics of the group shares. Whether or not there are many defectors, cooperators or enforcers has nothing to do with the level of the common property resource stock. Thus, individuals are oblivious to the need of developing a social norm. Given our discussion before, it may very well be the case that a social norm also gains importance in society simply because there is an inherent use for this norm. This is in line with the observation in [Arrow \(1970\)](#), who suggests that social norms arise in order to prevent market failures or reduce social costs. In a model that is similar in spirit to [Sethi & Somanathan \(1996\)](#), yet avoids the explicit modelling of enforcers, [Schumacher \(2009\)](#) assumes that the social norm evolves faster through society if there is a need for it, for example, if the common property

resource is close to depletion, or if environmental problems are abundant. In contrast, if there is little need for the social norm because the environment is clean enough, then the social norm is transferred much slower through society. This model also closely links with the theory of cultural transmission of preferences (Bisin & Verdier, 1998, 2001). One take-away message from this article is that, during the transition to a steady state, a high level of the common property resource will lead to few individuals that still adhere to the social norm, which subsequently will lead to more extraction, a low level of the common property resource, which then will increase the share of individuals in society that adhere to the social norm. History-dependence becomes crucial, and it is difficult to predict the extent of the social norm in society based on a particular level of the common property resource, as one level of the resource can be associated with a potentially large number of different shares of the social norm in society.

The feature underlying these theoretical contributions discussed so far is that of a public good game (or common property game) with either a unique or multiple Nash equilibria, which is then coupled with replicator dynamics to study the endogenous emergence of the share of those that adhere to the social norm.

3.2 Empirical results

An increasingly important number of empirical investigations has established a role for social norms in various environmental problems. Again this section will not contain a complete list of the contributions in this field, but it will give an idea of what channels have been investigated and what general results have been found.

3.2.1 Public goods in general

The theoretical models predict that, in public good settings, self-centred individuals (our homo oeconomicus) will generally not contribute to public goods (Samuelson, 1954). Instead, they will free-ride, the reason being that they view their own contribution to the public good

as too marginal compared to their costs of contributing. However, in many public good experiments it has been shown that free-riding is not necessarily the overwhelming response of individuals, but that individuals contribute to public goods even if theory predicts that the only outcome should be the zero contribution equilibrium. Among other channels, social norms are now known to play a significant role. For example, [Fischbacher et al. \(2001\)](#) find that 50 percent of individuals are conditionally cooperative, meaning that they cooperate when others cooperate and defect when others defect ([Gaechter, 2007](#); [Axelrod & Hamilton, 1981](#)). Some research suggest that this crowding-in of voluntary contributions is due to conformism ([Bardsley & Sausgruber, 2005](#)), or social norms related to self-categorization, while others argue reciprocity plays a dominant role ([Falk & Fischbacher, 2006](#); [Falk, 2007](#)). Whether or not individuals cooperate is also not a fixed effect, i.e. depending on individuals, but on the behavior of the group in general ([Falk et al., 2013](#)).

[Carpenter \(2004\)](#) uses an experiment to show how the social norm of conformity affects free riding. The main result is that the more individuals conform to free riding, and the more individuals have this information, the more people will free ride. Thus, social dynamics, through information that adjusts beliefs, affects the dynamics of social norms. Others have used field experiments to study the impact of social norms on charitable contributions (essentially public goods). [Shang & Croson \(2009\)](#) found that increasing social information, in this case information about the contribution of others, also raised the average contribution. Hence, social information and contributions are complements, suggesting a social norm at play. The social norm may be one of expectations, as discussed in ([Bicchieri, 2016](#)).

Cooperation can, thus, occur in groups, but it is conditional cooperation. If some members of a group shirk or do not conform to the social norm, then cooperation can immediately break down. Once individuals do not cooperate any longer, then without some changes to the fundamentals, it is unlikely that they will cooperate in the future. Consequently, over time, it is more likely that conditional cooperators will not cooperate rather than cooperate, unless there is sufficient further incentive to cooperate. This further incentive comes from

punishment and communication, which is viewed as most effective in solving social dilemmas (Janssen et al., 2010). If the sanctions for not cooperating are high enough, or if individuals are allowed to change expectations through a sufficient degree of communication, then cooperation may be sustainable in the long-term.

3.2.2 Social norms in different environmental situations

Cialdini et al. (1990) studied incentives for littering, where individuals were given the option to litter in a clean environment or in an already dirty one. Based on four field experiments involving between 127 to 484 participants, they found that individuals were less likely to litter in a clean environment, leading them to argue that not all social norms are in force all of the time or in all situations.

More evidence for social norms in littering comes from Torgler et al. (2009). The authors investigate whether environmental behavior (littering in this study) is influenced by the perception of others' behavior. They use the European Value Survey covering a sample of 32,433 respondents. Their main finding is that the perception of others' littering behavior has a significant impact on one's own littering, which they argue supports a social norm of conditional cooperation.

Several authors looked at the role of social norms for recycling. In the article by Abbott et al. (2013), the authors rely on a sample of 1,887 observations on recycling volumes and kerbside provision based on English local authority data. They study the determinants of recycling behavior and, in particular, show that a social norm for recycling exists. The authors conclude that a policy requiring mandatory recycling may not be necessary due to the social norm, and that a kerbside scheme may be helpful in increasing recycling rates as this is visible to the neighbours and thus can be more easily promoted through a social norm.

Cecere et al. (2014) use a large EU survey covering 22,000 individuals and investigate behavior related to food waste and recycling. They study a social norm based on reputation,

and find that social norms have a positive impact on recycling behavior, but that they have no impact on waste production. The reason that they forward for this is that waste production itself does not tend to be exposed to peer pressure and is not socially oriented. Thus, it is less likely to be influenced by a social norm. This result feeds back into our discussion, namely that a social norm requires visibility of the action or its result, in order for others to be able to evaluate individuals' choices.

Contrasting evidence comes from [Viscusi et al. \(2011\)](#). The authors rely upon a representative sample of 608 households' recycling behavior for plastic bottles from a 2009 US survey. They find that both private values (such as one's own environmental attitude) and government regulation have a significant impact on recycling behavior, while social norms pertaining to the belief of others' recycling behavior have no statistical effect. This suggests that public policies can crowd out social norms, something that we will get back to in the next section.

Some studies looked at energy conservation. For example, [Goldstein et al. \(2008\)](#) study 1,058 potential situations of towel reuse in a hotel, where guest were provided with signs that either said 'the majority of guests reuse their towels', or with 'the majority of guests in this room reuse their towels'. These social norms based messages yielded a significantly higher rate of towel reuse than environmental protection messages. In a second experiment, the authors investigated the importance of social identity in a social norm based on a sample of 1,595 potential situations of towel reuse in a hotel. Their results showed clearly that towel reuse increased if the social norm is tied with social identity.

In a large randomized natural field experiment covering 80,000 households in Canada, [Allcott \(2011\)](#) provided energy use reports to some households which contained information on energy conservation measures as well as social comparisons between households' energy use and their neighbours' energy use. The author finds that social comparisons provide an additional incentive for households to conserve energy, but that the impact on the incentives vanishes over time. The author also provides some evidence for what he calls the boomerang

effect, which may happen if someone is doing more than a social norm would prescribe, and therefore, upon receiving this information, the individual may reduce the effort. [Andor et al. \(2020\)](#) test the external validity of [Allcott \(2011\)](#) using data from a randomized controlled trial among 11,630 households in Germany. They find, while there is an effect from the social norm-based energy report cards, this effect is much smaller than the one from Canada. They argue that this is due to already lower electricity usage in Germany, which provides fewer possibilities to conserve energy.

In a survey of 810 Californians, [Nolan et al. \(2008\)](#) found that normative social influence is very important when it comes to energy conservation. The authors also noticed that those surveyed did not believe themselves to be strongly influenced by social norms, in contrast to what the empirical results showed. Thus, it seems that individuals are subjectively influenced by social norms, but do not really perceive this to be the actual reason for their choices.

[Barth et al. \(2016\)](#) studied electric vehicle adoption in Germany and found that both experts and non-experts view factors related to costs as being more important than social norms. Instead, when they indirectly estimated the most important drivers of electric vehicle adoption, they found that social norms play the biggest role. This is consistent with the finding in [Nolan et al. \(2008\)](#), which also shows that there is a certain bias in the beliefs of individuals.

[Yeomans & Herberich \(2014\)](#) surveyed drivers at petrol stations in Chicago in an experiment on tire pressure in order to study the importance of awareness, cost and social norms. The social norm used was a negative one, which basically informed drivers that most other drivers in the area are not inflating their tyres sufficiently. This negative social norm is known to undermine the belief that a certain action, motivated by the social norm, is socially desirable ([Cialdini et al., 2006](#)), a result that was also confirmed in [Allcott \(2011\)](#).

A variety of articles looked at green consumption or green production, and they all bear a similar message. Social norms work, and they tend to increase voluntary contributions. For example, [Huber et al. \(2018\)](#) study the role of social norms for voluntary carbon offsetting

in a representative sample of 1,919 car owners in Switzerland. Information on the social norm was provided in two ways, one via information on attitudes and behavior of other car owners, and the other via information on government policy for carbon offsetting, which the authors suggest carries an institutional signal of social desirability. They find that, while the information provided using the attitudes and behavior of other car owners had no effect, the combination of the information regarding government policy and other car owners' attitudes increased voluntary offsetting significantly. They argue that this is because few individuals offset, and thus the social pressure of offsetting is still very low.

[Litvine & Wüstenhagen \(2011\)](#) used a behavioural intervention survey with 1,163 Swiss consumers of electricity. They found that social norms which address the intention to purchase green electricity have little to no effect on the purchase of green electricity, unless information about these social norms was coupled with advertising or information campaigns. This is in line with the discussion in [Biel & Thøgersen \(2007\)](#), who discuss that social norms often need to be activated, which requires some impact on beliefs or expectations via e.g. advertising campaigns. However, this should only be the case if the social norm is unknown or protrudes little through society.

[Alpizar et al. \(2008\)](#), using evidence from voluntary contributions to a National Park in Costa Rica, find that individuals tend to contribute more to a public good if their contribution is not anonymous. This suggests that a social norm related to status or self-categorization may be at play. In addition, it could also be the case that social norms based on a punishment mechanism are relevant here, especially since the visibility of the action is a key criterion.

[Chen et al. \(2009\)](#) studied the role of social norms for nature conservation in China's Wolong Nature Reserve with more than 4,500 farmers. They found that social norms at the neighborhood level increased re-enrollment in conservation programs. This could be either due to a social norm of self-categorization, but it could also be due to potential punishment from others if one does not contribute to conservation, or it could be the result

of a coordination equilibrium.

Quite a few of the empirical studies presented in this section are lab experiments. It is important to accept that the results of lab experiments may not be externally valid ([Levitt & List, 2007](#)), and thus one has to be careful with interpreting too much into these. Nevertheless, the empirical results confirm the theoretical predictions, which at least gives some degree of assurance that the results from lab experiments may not be too far off from what we would expect to find in reality.

4 The role of policy making to guide social norms

Environmental problems tend to be collective action problems, implying that they impact a social group. Thus, social interactions often become relevant when dealing with environmental problems, and hence social norms can play a significant part both in contributing to collective action problems, but also in helping to reduce them ([Kinzig et al., 2013](#)). Collective action problems almost always arise due to some kind of market failure ([Mancur, 1965](#)), and as a result we observe externalities that lead to sub-optimal outcomes. When the standard market mechanism does not work effectively, then we are leaving the first-best and society tends to develop mechanisms to deal with the resulting misallocation or inefficiency. One way is through formal institutions such as government interventions, another one is through informal ones such as social norms ([Ostrom, 1990](#)).

The discussion in the previous sections has shown that social norms may be Pareto-improving. However, they are unlikely to yield a Pareto-optimal outcome as they are shared and enforced within a group. Thus, we cannot expect the resulting outcome to be socially efficient, for there is little reason to believe that a particular social group has the objective of welfare maximization of everyone. Sometimes they also move society in the wrong direction, leading to Pareto-inferior equilibria. This is especially the case when social norms develop more arbitrarily, or when social norms are more strongly related to issues such as status or

self-categorization. [P. Dasgupta \(2021\)](#) argues that "social norms of behaviour are able to sustain a mutually beneficial state of affairs if people care sufficiently about the future benefits of cooperation; but there are social norms that sustain states of affair where one group exploits another group." In the worst case, social norms can even introduce or exacerbate market failures. Hence, there is an important role for government policy, even in the case when social norms have been developed to deal with existing externalities, simply because they tend to be inefficient at fully internalizing externalities.

The objective of government policy should be to achieve the socially-optimal outcome, taking into account the collective action problem and the role of the social norm. Policy then needs to address two intertwined problems, the externality from the collective action problem related to the environment, but also the externality from the social norm. [Bowles & Hwang \(2008\)](#), [Ulph & Ulph \(2021\)](#) and [Meunier & Schumacher \(2020\)](#) develop theoretical models to study how to design optimal policy when faced with a public and a social norm. Social norms should be placed into the category of collective action problems, too, after all social norms arise from social interactions, with some groups adhering to the social norm while others do not find it optimal. As quite a few social norms arise from a Nash game, or a coordination game, with some individuals contributing to the norm while others do not, then, from a policy perspective, social norms could also be viewed as a public good. In that case, they ought to be subject to a similar analysis as public goods, the main difference being that free-riding in the case of social norms is costly as it will be punished.

Several problems arise then for a policy maker. The first issue for a successful policy intervention is to understand how the collective action problem and the social norm work together. Is there an existing social norm that can potentially be exploited by the policy maker when it comes to the collective action problem? Could the policy maker create a new social norm?¹⁵ Or is there a social norm that is exacerbating the collective action problem? In the case of a pre-existing social norm, such as the norm of not littering in

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public places, it is clear that this norm is helpful in order to reduce e.g. the spread of microplastics. In this case it is often optimal for the government to exclusively rely on the social norm itself, as littering is a decentralized action that is difficult to observe by the policy maker and thus hardly punishable by law. When it comes to meat consumption, where the production of meat adds a significant amount of carbon emissions, then there is a social norm of vegetarianism which helps society get closer to a meatless consumption. However, it may require many years for the whole of society to become vegetarian, and thus a policy maker may want to supplement interventions into the social norm with other policy tools such as more market-based ones.¹⁶ In the case of status seeking, where individuals seek approval from higher social classes by, for example, relying on an expensive lifestyle, it is clear that this social norm is detrimental for the environment. As a result, the policy maker would want to find a way to minimize the social impact of this norm of status seeking and, in addition, focus on ways to solve the original collective action problem without the social norm. In all of these cases it is necessary to acknowledge that there are additional costs from the policy interventions, and these costs can have important repercussions. [Meunier & Schumacher \(2020\)](#) show that, even if complete adherence to a social norm maximizes social welfare, the costs of any policy intervention may imply that it is not optimal to push society towards it.

A major problem with any policy intervention related to social norms is that these can have unintended consequences ([Ostrom, 1990, 2000](#)). [Frey \(1994\)](#) discusses several experiments and field studies showing that public policy, through e.g. rules, can crowd out social norms. Thus, a policy that may originally have been intended to crowd in private action through a social norm may, under certain conditions, have the opposite effect. A particularly problematic example comes from studies on energy conservation ([Allcott & Rogers, 2014](#)). A policy that introduces an information campaign to motivate individuals to reduce their energy consumption needs to be crafted carefully. If an information campaign that rests on

¹⁶For an application to meat consumption and vegetarianism see [Hestermann et al. \(2020\)](#).

e.g. introducing a benchmark which says “your neighbours are consuming on average an amount X”, and your energy consumption is above that level, then you may be inclined to reduce your consumption level. However, if your consumption level is below this benchmark, then this kind of message may lead to a boomerang effect as you may believe that it is fine for you to stop saving so much energy. A similar point has been raised in [Cialdini \(2003\)](#), who suggests that the statement “many people are doing something undesirable” also makes others believe that if many are doing it, then it is maybe acceptable to do the same.

Thus, it is important to rely upon messages that combine empirical expectations and normative ones. Another unintended consequence arises when policies erode social norms. A well-known example comes from a day-care centre in Israel, where parents often came late to pick up their kids. When the day-care centre introduced fines for latecomers, then parents came even later. The fine eroded the social norm, as parents did not feel any longer the social pressure that came with coming late, because they could now pay for coming late ([Gneezy & Rustichini, 2000](#)).

[Nyborg et al. \(2006\)](#) notes that it is possible to use market-based policies such as taxes or subsidies to permanently increase e.g. green consumption, unless the tax is viewed as taking responsibility away from the consumer, which may erode social norms. This is also suggested by [Cardenas et al. \(2000\)](#), who argue that, while individuals trade-off personal and group interests, they tend to place more emphasis on personal interests when faced with regulations, as the regulation is already taking care of the interests of the group. An additional problem arises in environmental problems, where often the polluter-pays principle is applied. However, paying to pollute transfers also the right to pollute ([Frey, 1993](#)), which then may erode the social norm of the producer who may have had at least some ambition to limit pollution. After all, if you pay to pollute, and you pay the optimal price, then why furthermore constrain yourself by a social norm? Hence, any policy that calculates the optimal price of pollution also needs to consider the secondary impact on the social norm, which may erode at least some of the benefit of the price policy. For example, when it comes

to the optimal price on carbon, or, in fact, any environmental tax, few studies take into account how the policy's impact on the social norm should, in turn, affect the policy.

After having figured out how the social norm interacts with the collective action problem, then the second problem that policy makers need to work out is what tools to use. Government interventions to guide social norms can come in a variety of ways, and are generally classified into soft and hard interventions (S. Banerjee et al., 2021). Soft interventions are typically educational measures, advertising campaigns or nudges (liberal paternalism), while hard interventions are focused directly on the markets, such as regulations, or financial incentives such as taxes and subsidies. Common problems that have been associated with hard policy interventions are crowding out of social norms, while their advantages are a clearer and more precise impact on the market as a whole. For example, if a government forbids smoking in public places, then the effect will be immediate, while a soft intervention such as an advertising campaign with messages on cigarette boxes may only have a limited impact. In contrast, soft policy tends to be more easily accepted by the public¹⁷ and also more cost-effective (Sunstein, 2016; Benartzi et al., 2017), while hard interventions restrict choices, which in general receives less public support (Kantenbacher et al., 2018; S. Banerjee et al., 2021). While soft interventions can lead to long-term behavioral changes, the impact of hard interventions usually only lasts as long as the intervention is in place.

The next problem is that policy makers need to find a way to make social norms pro-trude through the whole society in a cost-effective way. Which policy intervention may be cheaper? What are potential side effects? A policy maker ought to consider the short versus long-term consequences of the policy intervention, distributional consequences, effectiveness and costs. There is no general consensus on the circumstances under which each of these consequences is more important, so that each policy intervention requires an in-depth study of the problem, combining not only cost-benefit analyses from a financial side, but also from

¹⁷This is, however, not universally the case. For example, there was strong public support for Covid-19 lockdowns, and if the public is sufficiently well informed about, for example, harmful products, then they also fully support hard interventions (S. Banerjee et al., 2021).

a social perspective. If a policy maker could, for example, outright forbid the use of plastics, then it would solve the problem of additional microplastics. However, the social costs of this ban would be tremendous. Clearly, the development of a social norm that helps reduce the use of plastics would be a useful policy, coupled with market-based instruments such as taxes on plastics and subsidies on compostable alternatives. There are, however, very few studies that take this holistic approach, and even fewer that investigate how any policy would optimally direct a social norm in conjunction with market-based instruments.

An important point to consider here is that if the social norm is supposed to play a significant role to guide behavior towards the first best, then the diffusion of the social norm is crucial. However, social norms sometimes change in difficult and unforeseeable ways ([Ehrlich & Levin, 2005](#)). This makes it hard to predict the exact way in which a policy may help the diffusion of a social norm. A particularly useful feature of social norms is that their diffusion may be subject to tipping ([Nyborg, 2003](#)). Tipping is a feature that arises when a social norm has reached a sufficiently high level of protrusion through society. When sufficiently many individuals follow a social norm, then the likelihood of being punished for not adhering to it is large, and thus the expected cost of not following the norm is high. This induces more and more individuals to adhere to the norm. On the other hand, if very few individuals adhere to the norm, then the probability of being punished is also small, leading to low expected costs of not adhering to the norm, and thus fewer and fewer individuals will follow that norm.

The costs of public funds that are needed to address an environmental problem while still taking care of the social norm itself can introduce additional dynamics which are difficult to predict ([Meunier & Schumacher, 2020](#)). We have, in fact, very little knowledge of how the costs of public policy impact the optimal level of a social norm, and some early work on this suggests that the impact is not trivial ([Meunier & Schumacher, 2020](#)).

An additional problem that has seen far too little research is that we generally do not know the welfare costs of social disapproval, both for those who get punished if they do

not adhere to a social norm, but also for those who punish others. It is often difficult to place a monetary value on punishing, and sometimes individuals go to extremes when they punish someone who did not adhere to a social norm. These kinds of punishment can range from simply foregoing all monetary benefits in Ultimatum Games ([Henrich et al., 2004](#)), to honour killings prevalent in South Asian communities. Already the fact that individuals often find it optimal to adhere to social norms implies that there are sometimes substantial costs associated with these, costs that even outweigh the benefits of not adhering to the norm. Here it is clear that research needs to put in much more effort to understand how to monetize the effects from social norms.

5 Conclusions

In this article I explained social norms from the point of view of an economist, how they emerge and why they emerge, and how they protrude through society. The key is to understand that social norms play a fundamental role for the construct of our society, and emerge for a variety of reasons. They can emerge because there is an inherent lack in society to deal with a particular social problem, or they can simply emerge by chance without a particular underlying reason. This makes it sometimes difficult to understand the role that particular social norms play in society, and it also makes their impact difficult to assess. There are so many social norms out there, and sometimes it may feel as if most decisions that are taken are somehow subject to a specific norm, if not to multiple norms. This is a particular challenge for policy making, as it is not always entirely clear how individuals trade off various norms. When is which norm most important? There is very little research that has, so far, gone into the trade-off of norms. One reason is that it is an inherently difficult task. The temporal study of social norms already requires researchers to look at several equilibria, and the intertemporal analysis adds another layer of problems. If one now adds one or two or more social norms, that may either complement or supplement the first norm, then this

quickly gets out of hand. So a challenge for researchers is to figure out what is the most important norm for a particular problem, apply Occam's razor as far as useful, and then try to understand what are secondary or tertiary norms that may play an additional role.

When it comes to the particular role of social norms for environmental problems, then researchers can fortunately rely upon the whole literature of social norms and public goods for guidance, as most environmental problems belong to the category of collective action problems. Yet there are exceptions, especially if one wants to take the dynamic dimension of environmental problems such as climate change into account. Most collective action problems have been studied in a static setting, which gives an idea about the basic trade-offs, but certainly misses the intertemporal interaction between social norms, policy and the environment. [Schumacher \(2009\)](#) has given some preliminary analysis of how complicated the intertemporal interaction between norms and the environment can be. In terms of future research, we certainly need much more emphasis on trying to understand the dynamic interplay between the two. When are both endogenously determined and dependent on each others? Are there situations where social norms unidirectionally impact the environment? Is maybe one of the two predetermined? When do social norms emerge in order to deal with an externality? There is still a substantial lack in our understanding, although [Ostrom \(2000\)](#) has done a particularly good job at identifying some of the prerequisites.

When it comes to policy interventions to deal with collective action problems, then we need to remember that social norms themselves are very close to public goods and thus should be treated accordingly. Governments may want to design a good policy to deal with collective action problems such as climate change, microplastic pollution or the conservation of nature, but in order to do so they absolutely must take into account the social interactions that are relevant for those collective action problems. Politicians have to ask themselves the following questions: Have we identified all the social norms (or also other norms) that are relevant for this particular collective action problem? How do the social norms interact with the collective action problem that we would like to solve? What tools are at my disposal

in order to bring society as close as possible to the first best? While it is true that public policy may crowd out private action that otherwise would have been undertaken due to social norms, this is not a problem per se as long as this additional effect is taken into account. Some evidence suggests that public policy, if it is directed towards social norms, may have a long-term effect on individual's choices, while any kind of market-based intervention, be it regulation or price intervention, only lasts as long as the policy is in place (Kinzig et al., 2013). Schumacher (2009) suggests that, for this particular reason, it may be important to implement laws when public support through e.g. social norms is the strongest. The whole question then becomes whether we want to have a society that is doing the right thing because it is restricted by laws, or whether we want one that is doing the right thing because each individual in society feels obliged to do the right thing due to the pressure exerted by social norms. It seems unlikely that a consequentialist approach such as Utilitarianism used by economists can provide an answer here.

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