Behavioural perspectives for post-pandemic environmental policy[*]

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Abstract

In this article we use the recent Covid-19 crisis to investigate what motivates individuals in their decisions to deal with two externalities, namely disease transmission, in particular social distancing, and the willingness to undertake green expenditure. As motivators we look at economic egoism (homo oeconomicus), altruism, moral norms, social norms and regulation. We develop a survey to measure these motivators, the two externalities, and also standard socio-economic control variables. Our results, based on 1,356 responses, suggest that individuals missperceive both their own motivators for dealing with the externalities as well as the drivers of other people's decision. In addition, they misevaluate the importance of social motivators for their own decisions. We discuss the repercussions of these two results for environmental policy, in particular cooperation and coordination, as well the evaluation of welfare changes.

Keywords: government policy; social norms; public goods; Covid-19, moral norms; altruism.

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1 Introduction

Individuals' actions are not solely motivated by their own material payoffs but also by moral considerations, concerns for others, and the social context they act in. This is especially important when we consider choices that negatively affect others, as is the case for disease transmission or environmental problems such as pollution (Fisman and Laupland, 2009; Boulier et al., 2007; Carlsson and Johansson-Stenman, 2012; Nyborg, 2020). The recent Covid-19 crisis provides us with a situation where individuals are faced with a potentially severe negative externality and which can thus inform us about the factors that drive individuals' decisions when confronted with such a dire situation.[1] Our aim in this article is to understand what are the factors that motivate individuals to deal with two externalities (disease transmission and environmental expenditure), whether individuals understand them correctly, and then provide potential lessons for environmental policy.To do so we ran an on-line survey at the turn of the lock-downs in May 2020 in France and Luxembourg.[2]

Both disease transmission and pollution are classical example of negative externalities. In both cases individual can make efforts that will not only benefit themselves but also others. It is costly for people to implement social distancing, but this may slow the spread of the virus and protect others.[3] Similarly, individuals may decide to take their bike instead of their car to go shopping, which reduces local and global air pollution but incurs a cost in terms of higher effort. In both cases, an egoist, or textbook homo oeconomicus, will undertake efforts to increase social distancing or reduce (local) pollution if (s)he believes that this will sufficiently reduce the own harm. In contrast, an individual that is also motivated by social aspects or by regulation may decide to undertake actions without the need to be impacted directly.

Research in several disciplines (sociology, psychology, biology, economics) has identified

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[1]The advantage of using the Covid-19 crisis is that we can ask individuals about their actual, current decisions, instead of some hypothetical impacts as is often the case for e.g. studies on climate change impacts. This should reduce various biases that could otherwise occur Murphy et al. (2005).

[2]Part of the surevy is presented in the Appendix. All the survey data are available upon request to the authors.

[3]By costly we mean that individuals need to, for example, bear the discomfort of wearing a mask, or deal with the psychological effort of keeping distance to others.

a variety of factors, beyond one's own material situation, that influence an individual's behavior in the social context. These additional motivators are notably social and moral norms as well as altruism.[4] Altruism and norms have been found to significantly determine attitudes towards environmental policies (Gowdy, 2007; Venkatachalam, 2008; Carlsson and Johansson-Stenman, 2012; Nyborg, 2003, 2020). It is clear that the design of policies should thus incorporate these motivations if it is to be more politically tractable and efficient.

In this paper we then divide motivations into four broad categories: selfishness, altruism, moral norms and social norms, and finally regulation. Our first motivator is a 'purely' selfish one reflecting an individual who is mostly concerned with him- or herself. This would correspond to the economists' standard homo oeconomicus, which we dub an individual's *egoist* motivator. The second motivator applies if individuals are driven by the concern for others (Andreoni, 1989, 1990) and we call this *altruism*. Our next motivator concerns an individual's moral imperative (Sugden, 1984; Brekke et al., 2003), where doing the right thing, or not harming others, is the defining criterion of this motivator. We call this *moral norm*. The next motivator is defined by a desire for conformity, social approval or aversion to social disapproval, or reciprocity (Elster, 1989; Sobel, 2005) and this is our *social norm* motivator. The final motivator is *regulation*, by which we want to capture an individual's desire to adhere to hierarchy or rules set by authority.

It is clear that individuals can be driven by several of these motivators at the same time. For example, the literature has identified some overlaps between these motivators (e.g. altruistic moral norms), and somewhat different categorizations and definitions have been proposed in other disciplines (e.g. Elster, 2009; Graham et al., 2013). We follow here the revealed preferences framework used in economics, which favors a categorization based on behavior rather than psychological or evolutionary explanations. In order to empirically estimate the motivations of individuals, and also to study whether individuals themselves fully understand the reasons for their decisions, we conducted a survey about the motivations to undertake social-distancing and the willingness to undertake green expenditure. We obtained 1,356 responses from France and Luxembourg, with roughly 85% of the respondents coming from France. We also added a variety of standard socio-economic control

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[4]In addition to these motivations, there are many behavioral "bias" have been identified that are less dependent on a social context such as endowment effects Knetsch (1989), disparities between willingness to accept and willingness to pay (Horowitz and McConnell, 2003; Bateman et al., 1997), or time inconsistent behavior O'Donoghue and Rabin (1999).

variables.

Our main results are the following. We find that individuals tend to view their own reasons for social distancing to be more altruistically motivated than other people's reasons for social distancing. In effect, roughly 50% of our respondents answer that others act for more egoistic reasons, or because they want to adhere to regulation. We dub this *Motivational Misperception*. We find that this yields useful insights for the design of environmental policy as this misperception goes in a particularly unhelpful direction, as it makes (especially one-shot) cooperation and coordination less efficient. We show that this misperception may lead individuals to coordinate on worse equilibria compared to the case where they correctly perceive the others' motivators.[5]

Our second result concerns the importance of norms. When we ask respondents directly as to what are their main motivators for social distancing, then they claim these to be mostly altruistic or egoistic motivators. Only less than 5% of respondents suggest that they are mainly motivated by social or moral norms. However, when we indirectly infer the motivations of individuals, then we find that egoistic or altruistic motivators only play smaller roles for individuals' actions. In contrast, norms, especially social norms, turn out to be a key motivator. A similar result has been found in Nolan et al. (2008) who show that people underestimate the impact of others on their own actions. Thus, individuals seem to be unaware, or downplay, the fact that others strongly determine the reasons for their own actions. The inability of people to correctly evaluate the drivers of their behavior is well documented in the psychology literature (Haidt, 2001), and their inability to assess the influence of others has also been found in the literature on the bystander effect (Latané and Nida, 1981). A related phenomenon is the Introspection Illusion (Pronin, 2009) according to which individuals overestimate their ability to introspect while being suspicious of the ability of others of doing so.

The article is structured as follows. In section 2 we define the motivators, discuss how they are viewed in the literature, and explain how we derive them from the questions in the survey. In section 3 we present the empirical approach and the results. In section 4 we discuss lessons for the design of environmental policy. Finally, section 5 concludes.

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[5]This result is related to the work of Kreps et al. (1982) and Andreoni and Miller (1993) on repeated prisoner dilemma games. Individuals progressively build reputation of altruism and learn about the other's type and increase cooperation.

2   Defining the motivators

We now discuss what motivates individuals' decisions or actions, both from a traditional, homo oeconomicus perspective, from an altruistic perspective, then from the perspective or hierarchy or regulatory guidance, and finally from a social context which drives social and moral norms. We provide a discussion of how we expect these motivators to influence both social distancing and the willingness to invest in green expenditure, and we furthermore explain how we measure them based on the questions in the survey.

2.1   Egoism

The standard economics textbook depicts people as being exclusively concerned with their own basket of consumption goods, such as food, housing, education and travel, but also health (Gowdy, 2007). Goods that have a social dimension, such as public goods, are only valued according to the direct utility that they have for this person which will then free ride and under provide public goods such as environmental quality (Cornes and Sandler, 1985). Such an agent will undertake social distancing by weighting the probability of getting infected with the cost of prevention without other considerations.[6]

In order to measure how egoistic an agent is we combined the questions shown in Table 1 from the questionnaire via Factor Analysis. The unique Eigenvector is above 1, which suggests that the questions fit sufficiently well together to be explained by this unique factor. We expect that egoism has a distinctively negative impact on a respondent's willingness to undertake green expenditure as we expect free rider incentives to play an important role. The case for social distancing is less clear - social distancing itself is a significant cost for an individual, but it also prevents the spread of disease on oneself.

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[6]Most of the analytical model developed by economist to analyze the current epidemic are based on that assumption (Garibaldi et al., 2020; Eichenbaum et al., 2020; Toxvaerd, 2020; Makris, 2020). Policy interventions are then justified by infection externalities.

Table 1: Motivator: Egoism

Variable	Description
Egoism	Are you similar to this fictitious person: This person would like to be successful and that other people recognize her/his achievements.? (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person would like to be rich in order to buy expensive things? (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person would like to be rich in order to buy expensive things? (1 - not at all similar, 4 - very similar)
	How important it is in your life: wealth? (1 - not at all important; 4 very important)
	How important it is in your life: spend a good time and amuse herself/himself? (1 - not at all important; 4 very important)
Eigenvector	1.00312

2.2 Altruism

Altruism has received quite a lot of attention within the literature, where the concept has been refined, notably compared to the very broad definition in evolutionary biology.[7] Researchers in general distinguish between pure altruism, impure altruism (Andreoni, 1989, 1990) and paternalistic altruism (Archibald and Donaldson, 1976; Jones-Lee, 1991).[8] A pure altruist values the well being of other people. An impure altruist derives some private utility from the impact that he has on others. This has been largely studied in the literature on public goods, where an impure altruist would obtain utility from contributing or a disutility from not contributing, respectively labeled "warm glow" and "cold prickles" (Andreoni, 1989, 1990, 1995). A paternalistic altruist values some arguments of others' utility, such as their health (Archibald and Donaldson, 1976; Jones-Lee, 1991). For the

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[7]According to the Stanford Encyclopedia of Philosophy : "In evolutionary biology, an organism is said to behave altruistically when its behaviour benefits other organisms, at a cost to itself." (https://plato.stanford.edu/entries/altruism-biological)

[8]Note that pure altruism does not help explain substantial contributions to public goods (e.g. NGOs, climate change) in a large population, as stressed by Sugden (1984) and Johansson (1997).

sake of simplicity, and as it is very difficult to distinguish empirically between these forms of altruism, we simply group them all under the heading of altruism.

Concerning epidemics, altruism has been shown to play a role for decisions to get vaccinated (Hershey et al., 1994; Skea et al., 2008; Vietri et al., 2012; Shim et al., 2012; Böhm et al., 2019). In the context of the current pandemic, Alfaro et al. (2020) use data on movements together with the Global Preferences Survey (Falk et al., 2016) to estimate the role of altruism, patience, and negative reciprocity on social distancing. With an incentivized study Campos-Mercade et al. (2020) found evidence that pro-sociality (estimated with a donation game) predicts social distancing.[9]

In order to measure how altruistic an agent is we again relied on Factor Analysis to find the common factors driving the decisions that we believe should be altruistically motivated. The questions that we used are shown in Table 2. The unique Eigenvector is above 1, suggesting that the questions fit sufficiently well together and are thus a relevant determinant for altruism. We expect that altruism increases an individual's willingness to undertake social distancing, as altruism implies a concern for e.g. relatives or family. Here an individual has the ability to reduce the spread of the virus by increasing social distancing. While standard economic theory predicts that altruism does not overcome the free-rider problem in sufficiently large public good settings, our broader interpretation of altruism suggests that altruism may nevertheless be a potential driver of an individual's willingness to undertake green expenditure (Andreoni, 1989, 1990, 1995). As our measure of green expenditure is also not only focusing on large-scale externalities (such as climate change), we argue that we should see a positive impact from altruism on our two externalities.

2.3 Moral norms

A norm is a reference behavior in a given context and induces what one ought to do in particular circumstances. There exist several ways to classify norms, a common distinction is made between moral norms and social norms, the former being enforced via internal sanctions (guilt) and rewards (pride), while the latter via social approval and disapproval

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[9]The two questions in the Global Preference Survey (Falk et al., 2016) to measure altruism are: "Today you unexpectedly received 1,600 USD. How much of this amount would you donate to a good cause?"; "how willing are you to give to good causes without expecting anything in return?".

Table 2: Motivator: Altruism

Variable	Description
Altruism	How important it is in your life: Help people in poor, developing countries financially. (1 - not at all important; 4 very important)
	Do you agree: Do you help a stranger to pick up something (s)he dropped? (1 - never, 4- always)
	Do you agree: Do you give money to homeless people? (1 - never, 4- always)
	Do you agree: Do you give money to charities? (1 - never, 4- always)
	Do you agree: Do you help people if you see they are in need of help? (1 - never, 4- always)
Eigenvector	1.53084

(Elster, 2009, e.g).[10] We consider here that a moral norm concerns pro-social behaviors (harming/helping others). In psychology the intuitive nature of moral judgment is stressed notably in the influential moral foundation theory (Graham et al., 2013).[11] There are quite a few theoretical contributions studying the implications and determinants of moral norms, such as Sugden (1984) and Brekke et al. (2003), while Kaplow and Shavell (2007) analyze what would be an optimal moral system in a welfarist setting.

It is generally not easy to distinguish between altruism and moral norms. Our interpretation here is that altruism is a motivator that only applies to feelings towards other humans. Thus, voluntary work such as for the environment or animal rights should not be driven by altruism (first question of motivator moral norm). Furthermore, from the theoretical literature, we know that altruism is not sufficient to induce contributions in large public good games. Hence, altruism cannot be a motivator for the reduction of carbon

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[10]There is no consensus about the distinction between moral and nonmoral norms (O'Neill, 2017). The degree of internalisation of a norm is not dichotomous, and Thøgersen (2006) expand the taxonomy of personal norms at work in pro-environment behavior by their degree of internalization.

[11]As noted by Thøgersen (1996) "people tend to mentally classify environmental behaviors like recycling within the domain of morality. Intentions in this area are not based on a thorough calculation (conscious or unconscious) of the balance of costs and benefits but are a function of beliefs in what is right or wrong." (see also the review of Mazar and Zhong, 2010, on green consumerism).

Table 3: Motivator: Moral norm

Variable	Description
Moral norm	How important it is in your life: Voluntary work (in your commune, for the environment, animal rights). (1 - not at all important, 4 - very important); multiplied by (1-*others*) dummy to distinguish from social norm
	Do you agree: Do you try to reduce your flights and your travel by car to reduce your carbon emissions? (1 - never, 4- always)
	Do you agree: Do you pick up litter from the street? (1 - never, 4- always)
	Do you agree: Imagine you scratch another car while leaving your supermarket parking slot, yet nobody saw this. Would you leave a note ? (1 - never, 4- always)
	Do you agree: Imagine you find a wallet with 30 euros, and a business card with a phone number. Would you call the number to return the money? (1 - never, 4- always)
others	How important is this in your life: what others think about you (1- not at all important, 4 - very important); recoded as a dummy (category 1&2 recoded as 0; category 3&4 recoded as 1)
Eigenvector	1.33567

emissions (second question of motivator moral norm). The last three questions look also at a more moral than altruistic aspect of an individual's action. We would argue that people answer affirmatively to these questions not because they care about the other person (in fact they do not know the person), but because 'it is the right thing to do'. Hence we expect that these decisions are driven more strongly by an internal obligation than because one sincerely cares about someone else.

In order to measure how important moral norms are for our respondents we again rely on Factor Analysis to find the common factors underlying the answers to the questions that we argue are motivated by moral norms. Table 3 summarizes the questions that we combine into our motivator Moral norm.

2.4 Social norms

An individual should follow a social norm because (s)he cares about how (s)he is perceived by others and how (s)he expects others to adhere to the norm. We thus follow much of the literature and consider that a 'social norm' is a rule of behavior that is enforced through social approval and disapproval (Elster, 1989). Social norms have been shown to play a role in various kinds of pro-social behavior,[12] even though they might also be anti-social as illustrated by the recent experiment of Dimant (2019).

What specifically distinguishes social norms from egoism or altruism is their social dimension and their dynamics. These norms can spread or vanish, and often exhibit reinforcing mechanisms where the more people adhere to a norm the more likely is its adoption for an individual. Such mechanism can yield multiplicity of equilibria (Young, 2006, 2014; Planas, 2018), an issue that we will return to later in section 4. Concerning public goods, Rege (2004) stresses that a subsidy can help unlock society from a zero-contributor situation and push it toward a full contribution equilibrium (see also Lin and Yang, 2006; Nyborg et al., 2006).[13] In her recent article, Nyborg (2020) reviews some of the literature on social norms, drawing a parallel with (direct and indirect) network effects. Cialdini (2003) analyze how a public campaign should leverage social norms. There seems to be some growing consensus that social norms play a highly significant role in individual's decisions (even though they might not know about it). Allcott and Kessler (2019) show that people reduce their energy consumption when they can compare their energy consumption to a peer group. They estimate the willingness to pay to participate in the program in order to find out the cost associated with the social nudge and conclude that this willingness to

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[12]Social norms concern a wide range of behaviors (from tipping to vengeance). To contribute to a public good is a special case of a 'pro-social' social norm. Social norms have been shown to play a role for littering (Cialdini et al., 1990; Torgler et al., 2009), energy consumption (Allcott, 2011), recycling (Hage et al., 2009; Viscusi et al., 2011), smoking (Nyborg and Rege, 2003b), fuel economy (Yeomans and Herberich, 2014), tax evasion (Frey and Torgler, 2007), blood donation (Bruhin et al., 2020) or vaccination (Hershey et al., 1994). Farrow et al. (2017) provide an overview of the theoretical approaches and the empirical evidence related to pro-environmental behaviors.

[13] The models of Rege (2004); Nyborg et al. (2006); Lin and Yang (2006) does not explain why there is a social norm to contribute but model its dynamics. Others, within the immense literature on the evolutionary roots of human altruism and pro-social behavior, have tried to model the emergence of social norms as evolutionary stable, fitness enhancing strategies (e.g. Bicchieri et al., 2004; Bowles and Gintis, 2009).

pay is very high.

Several important results on social norms will be central for our empirical investigation. Firstly, social influence is often under-reported, as people do not consciously assess its influence (Cialdini, 2005; Schultz et al., 2007; Nolan et al., 2008).[14] While people care, more or less consciously, about their social status and want to be perceived as pro social, they, paradoxically, believe themselves not to be motivated by status or influenced by peers. Furthermore, the current consensus in the psychology literature holds that people do not know their true motivation, and entertain a biased perception of themselves and engage in self-deception (e.g. Kurzban, 2012).[15] As an example for this phenomenon, and related to environmental policy, Johansson-Stenman and Martinsson (2006) analyze the concern for self image and status, and analyze a survey about self-declared motivations to buy a new car. The result is that people declare that they are less concerned about status than others, and also claim to be more environmentally concerned than others. Thus, individuals have an overly positive self-imagine.

Table 4 summarizes the questions that we combine via Factor Analysis to obtain the motivator Social norm.

2.5   Regulation

Our final motivator is of hierarchical nature and it refers to how individuals adhere to hierarchy or regulation. This is certainly relevant when one deals with issues such as social distancing or if individuals have a preference for regulatory interventions when it comes to dealing with public goods or externalities such as pollution or climate change. There are some authors (Langevoort, 2002) who argue that there is an inherent conflict between regulation and social motivators. An implication is that sometimes social motivators work better than regulation, while at other times adherence to regulation is a more important motivator.

In Table 5 we summarize the questions which we combine via Factor Analysis to find the common motivator regulation. It should capture an individual's underlying willingness

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[14]The tendancy to downplay the influence of others has been notably documented in the vast literature on the bystander effect (Latané and Nida, 1981).

[15] Bénabou and Tirole (2002) develop a model of rational self-deception.

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Table 4: Motivator: Social norm

Variable	Description
Social norm	Are you similar to this fictitious person: This person believes that if most people do something then it must be the correct thing to do. (1 - not at all similar, 4 - very similar)
	Do you agree: A very close friend offers you a hat for your birthday, yet you don't wear hats. Would you start wearing one ? (1 - never, 4- always)
	Do you agree: Imagine you arrive at a dinner wearing a t-shirt while all your friends are dressed up (skirt, shirt). Would you feel embarassed? (1 - never, 4- always)
	Are you similar to this fictitious person: This person wants to always do the right thing to minimize conflict with others. (1 - not at all similar, 4 - very similar)
	How important it is in your life: Voluntary work (in your commune, for the environment, animal rights). (1 - not at all important, 4 - very important); multiplied by *others* dummy
	This person takes care of family and relatives despite high personal costs. (1 - not at all important; 4 very important); multiplied by *others* dummy to distinguish from moral norm
others	How important is this in your life: what others think about you (1- not at all important, 4 - very important); recoded as a dummy (category 1&2 recoded as 0; category 3&4 recoded as 1)
Eigenvector	1.56974

to adhere to regulation, and driving forces include risk aversion, the acceptance of hierarchy, conformity and rules such as those derived from tradition. We argue that someone who feels regulation is important should be more willing to contribute to reductions in the externality if there is a top-down regulatory intervention. For the case of social distancing, one can make a clear case that regulation played a significant role in people's social distancing. This is the main reason for which we introduce this motivator. When it comes to determining an individual's willingness to undertake prevention expenditure, we expect to measure something else entirely. If there is regulation in place, then there would not be a need for a financial investment in green expenditure. As such, we should expect a negative relationship between our motivator regulation and the willingness to undertake green investment. Furthermore, someone who feels like a regulation would be better suited to solve an externality, because, for example, of a free rider problem, then the data should suggest that for this person the relationship between the motivator regulation and the willingness to undertake green expenditure should be negative. Finally, there is some evidence that regulation crows out individual contributions (Nyborg and Rege, 2003a), which again suggests that there should be a negative relationship between regulation and green expenditure.

3   Empirical analysis

In order to understand how important the different motivators are for an individual's willingness to undertake or support preventive actions, we decided to develop a questionnaire. This questionnaire was (mostly) circulated via an advertisement in Facebook in both France and Luxembourg. We obtained 1,356 complete responses. While we cannot claim representativeness, we nevertheless have answers from respondents with large differences in backgrounds as our Facebook advertisement was run all over France and Luxembourg with the widest possible target group. The whole questionnaire is available in our online appendix.

As we want to compare the motivators that determine social distancing and those that determine the willingness to undertake green expenditure, we rely on two measures. One measure comes from the current Covid-19 pandemic and is an individual's willingness to undertake social distancing (*mask*). We use the question whether an individual would be

Table 5: Motivator: Regulation

Variable	Description
Regulation	Are you similar to this fictitious person: This person is careful to follow laws and regulations, even if they don't always make much sense. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: It is not important for this person to be creative and do things in his/her own way. (1 - not at all similar, 4 - very similar)
	Do you agree: Imagine you were a soldier and disagreed with the commanding officer's orders, would you obey anyway because it is your duty? (1 - never, 4- always)
	Are you similar to this fictitious person: This person tries to avoid everything dangerous and prefers a safe environment. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person loves risk and adventure and wants to live an exciting life. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person respects the traditions that she/he learnt from society. (1 - not at all similar, 4 - very similar)
Eigenvector	1.344

prepared to wear a mask in crowded places even if the government was not enforcing this anymore but would only suggest individuals to wear masks. For social distancing, some behaviors are observable (wearing a mask, physical distance), others are not (washing hands and masks, checking temperature, reduced frequencies of shopping). We expect that observable actions, that furthermore induce a larger disutility for individuals, are more likely to be reported correctly, and thus we will focus on mask wearing in our investigation. The other variable (*green*) is a measure of an individual's willingness to undertake green preventive expenditure. We derive this measure via Factor Analysis from several variables that ask whether a respondent would be happy to face higher prices, or higher taxes, in order to improve the environment, or whether an individual would support a green stimulus in the aftermath of the Covid-19 crisis. We redefine both willingnesses to undertake or support preventive actions as a dichotomous variable in order to easily compare the motivators, where both variables take a 1 if an individual prefers to undertake the action, while it takes a 0 if an individual prefers to not undertake the action.[16]

As a first step towards understanding what drives the motivations[17] of individuals for social distancing, we simply asked respondents directly as to what they believe are their main motivations and what they believe are the main motivations of others for social distancing (see Table 10). The possible answers were the following categories: avoid being sick because of possible personal health consequences (*own impact*); avoid being sick for helping to reduce the spread of Covid-19 to family members, relatives or friends (*impact relatives*); avoid being sick for helping to reduce the spread of Covid-19 to society in general (*impact society*); because it is government regulation (*regulation*); Do as other people do / It feels right / Because other people will appreciate this (*norms*). We recoded these motivators as dichotomous variables where the variables take a 1 if an individual chose this motivator as his/her main motivator (similarly for the motivation of others). The motivators *impact society* and *impact relatives* are what we view as more altruistic motivators, while the *own impact* is a more egoistic motivator. Someone who tends to

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[16]The regression results continue to hold if we use the original categorical variable or the original factor variable.

[17]Due to convergence issues we were unfortunately unable to undertake factor and correlation analysis across all the attitudinal questions, which could have helped us to establish the degree to which these questions are measuring distinct concepts. It is, however, important to see that we do not have the underlying assumption that the groups of questions elicit measures that are orthogonal. Someone who scores highly on a social norm motivator may also score highly on a moral norm motivator.

adhere to regulation, and thus independently of his or her preferences, would score a one in the *regulation* motivator. With the *norms* motivators we intend to capture the social dimensions, social norms and moral norms. Getting a bit ahead of our results, these three motivators figured so little in the respondents' answers that we decided to collect them together in the *norms* category.
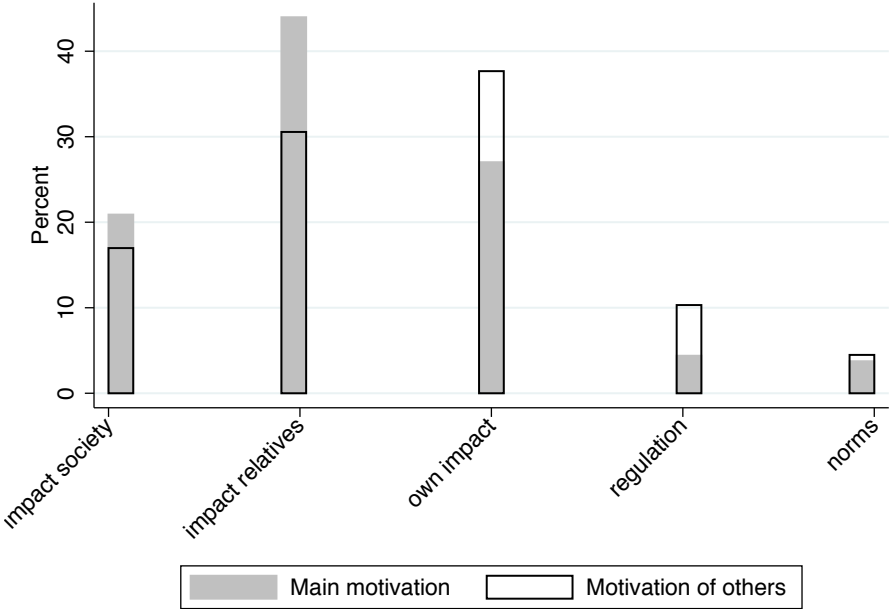

Figure 1: Own motivation vs. perceived motivation of others for social distancing

Figure 1 gives our first results. It shows the percentage of respondents categorized according to what they believe is their own main motivation for social distancing. We see that respondents consider that the main motivations for their own social distancing is the potential impact that they would have on their relatives (impact relatives) as well as on society in general (impact society). One could argue that these are altruistic reasons for social distancing. The egoistic reason for social distancing (own impact) is the second most important motivator for social distancing. Only less than 10% of the respondents view the fact that it is government regulation as their main motivator for social distancing. Most importantly, the *norms* together make up less than 5% of the respondents' main motivator for social distancing. These last three motivators that we collected together in the category *norms* are motivators that have a substantial social and moral dimension. For example, in the literature on social norms, individuals are assumed to adhere to a social norm because

of conformity or because of social stigmatizing. What we find here, however, is that our respondents do not feel that these play a relevant role for their own behavior. From this we can, therefore, conclude that respondents believe that they mostly undertake social distancing to prevent harm or because it is regulation, but they do not believe they do this because they follow a norm.

A somewhat different picture emerges when respondents are asked about the main motivation of others for social distancing. Here we observe that respondents, on average, believe egoistic motivations (*own impact*) to be the the main motivation of others for social distancing. Respondents believe that others undertake social distancing to a lesser degree to reduce the impact on relatives (*impact relatives*), or because they want to reduce the impact on society (*impact society*). Thus our preliminary results suggest two conclusions. One, individuals view others as less altruistic compared to themselves, and, two, they believe that social or moral norms do not play a role in their choices.

Nevertheless, there is clearly plenty of research suggesting that norms, and especially social norms, are important mechanisms when it comes to interactions between individuals, groups or societies Nyborg (2020). Hence, in order to understand whether norms are motivators and individuals simply do not know their true, underlying reasons for their decisions, or whether norms are negligible, we derived indirect measures of individuals' preferences, which are the motivators that we introduced in section 2: *Egoism*, *Altruism*, *Moral norms*, *Social norms* and *Regulation*. These motivators are derived as an *indirect* measure and they are thus a proxy for an individual's motivation along the different dimension of egoism, altruism, social and moral norms as well as regulation. As an example, an individual who is identified as someone who is strongly characterized by a social norm would score a 1 on the social norm measure, and a 0 otherwise. We allow individuals to be characterized by several motivators as there is no reason to believe that an individual is only motivated by a social norm and, for example, not also by regulation.

Figure 2 then shows the average willingness to wear masks split up according to the different motivators of individuals. The vertical thin lines are the 95% confidence intervals for the mean responses. If we take the example of the indirectly measured motivator *Social norm*, then we see that of those individuals who do not score highly on our social norm measure, thus those that we argue are not motivated by social norms, on average 80% would wear a mask. Of those individuals who score highly on our social norm measure,
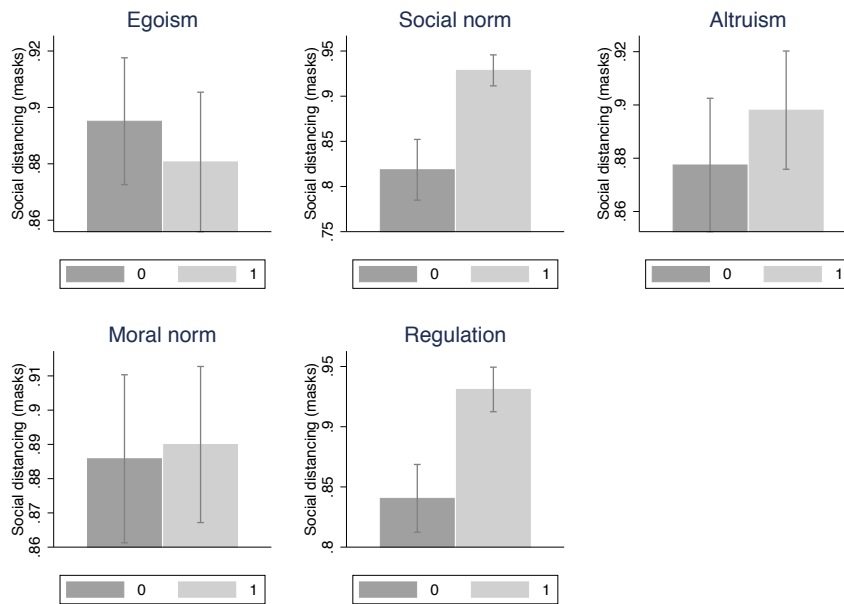
Figure 2: Indirect motivators of social distancing

hence those who tend to be motivated by social norms, around 93% tend to wear a mask. The confidence intervals show that, on average, there is a highly statistically significant difference between the proportion of individuals who wear a mask motivated by social norm reasons, and those who are not motivated by social norms. The only other motivator that shows up as highly statistically significant is regulation, implying that those individuals who tend to adhere to regulations are also those that are more likely to wear a mask. All the other motivators, Egoism, Altruism and Moral norms, also tend to be motivators that induce individuals to wear masks more often, but it seems that they do not motivate individuals enough in order to show up as statistically important. In other words, we do not find that someone, who for example is more altruistic than someone else, would be more likely to wear a mask.

The results in Figure 2 paint a different picture than what we saw above in Figure 1. When we asked respondents directly about their motivations, or the motivations of others, then social norms did not play an important role. However, using our indirect measures, we find that both social norms and regulation are statistically significant predictors of respondents' social distancing. Based on these indirect measures, this leads us to the conclusion that social norms are important and individuals are simply not well-aware of

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their true, underlying reasons for their decisions.

One question is whether the motivators that we obtained for Covid-19 also play a similar role for an individual's willingness to undertake green expenditure in general. Here the
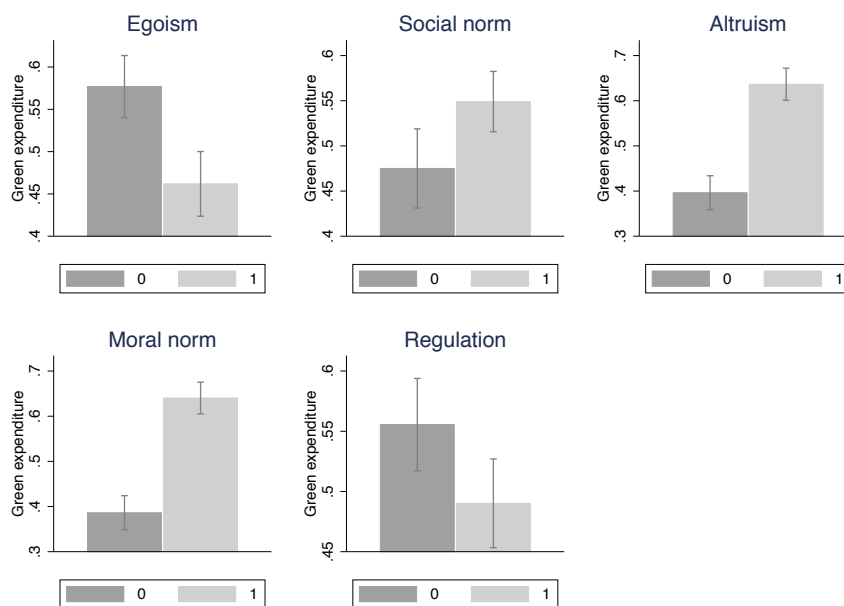

Figure 3: Indirect motivators of green expenditure

results paint a different picture. Firstly, *social norms*, *altruism* and *moral norms* all play an important role for an individual's willingness to undertake green expenditure. In contrast, *egoism* affects an individual's willingness for green expenditure negatively. While in the case of *regulation* we see a reduction in the willingness to undertake green expenditure for those who adhere to regulations, this result is not strongly statistically significant. This result is different from the one that we obtained for social distancing. The reason is the following. The green expenditure variable is derived from a combination of questions of either country-wide or global environmental problems. Thus, someone who is more egoistic is unlikely to be willing to undertake green expenditure simply because that person would prefer to free-ride on the effort of others. Also, our survey was run in Europe, a region that is expected to suffer little from climate change.

To reinforce the graphical analysis above, we ran regressions in order to understand whether these results continue to hold if we take further controls into account. The list of

additional controls is in Table 11 and they include the typical socio-economic controls such as gender, age, income, schooling, place of living, work environment, and the number of children. In addition, we have specific control variables that are important determinants of mask wearing, namely whether individuals believe masks are effective, whether they view them as uncomfortable, whether they believe Covid-19 may harm certain groups (themselves, relatives, the country, the world), and whether individuals perceive themselves to be part of the Covid-19 risk group. Table 14 presents the main regression results of our probit regressions, and Table 6 presents the marginal effects of our motivators. We run four different models. In models (1) and (2) we regress our dichotomous measure for social distancing, namely whether individuals would wear masks in crowded places despite the government only suggesting their use and not enforcing them, on our main motivators. In regression (2) we add additional controls, namely whether respondents view masks as uncomfortable and whether they view them as an effective means of reducing the spread of the virus, and whether they believe they belong to the risk group or whether they believe that the Covid-19 virus may do harm to others. We find that the main motivators that have an effect that is statistically significantly different from zero are *social norms* and *regulation*. Both increase the willingness of individuals to wear masks as a means of social distancing. In regressions (3) we regress a respondent's willingness to undertake green expenditure on the same motivators, and in regression (4) we add socio-economic controls as well as subjective measures of environmental quality (*Climate change*, *Local env. qual.*). Our econometric results confirm that, despite adding the additional controls, the results presented in Figures 2 and 3 continue to hold.[18]

Robustness exercises: We ran a biprobit model to see whether we can improve the regression results by allowing cross-regression correlation in the errors. However, the correlation of the errors was sufficiently low to exclude the possibility of any gains from a joint modelling. This is also confirmed by the observation that the coefficients were all very similar in the individual probit models as well as in the biprobit model. We also tested model misspecification based on the Hosmer-Lemeshow test (HL test) and the Langrange Multiplier test (LM test). While the models without controls suggest the absense of model misspecification, this no longer holds for the models with the controls. However, as the coefficients of the motivators are very similar with and without controls, we feel that we

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[18]The coefficient of *regulation* in model (4) loses significance when adding the further controls but the sign is still the same.

Table 6: Marginal Effects (Average Probabilities) of Main Regression Results

Model	(1)	(2)	(3)	(4)
Dep. var.	Masks	Masks	Green	Green
	without controls	*with controls*	*without controls*	*with controls*
	Coef./S.e.	Coef./S.e.	Coef./S.e.	Coef./S.e.
Egoism	-.023	-.012	-.068*	-.113***
	(.0249)	(.0160)	(.0402)	(.0358)
Social norm	.026***	.024***	.068***	.033***
	(.0043)	(.0073)	(.0076)	(.0088)
Altruism	.020***	.009	.096***	.071***
	(.0073)	(.0092)	(.0263)	(.0137)
Moral norm	.005	.009	.174***	.156***
	(.0132)	(.0090)	(.0144)	(.0089)
Regulation	.076***	.059***	-.055***	-.012
	(.0013)	(.0019)	(.0025)	(.0104)

Remark: Robust standard errors in parentheses. * p<0.1 , ** p<0.05 , *** p<0.01.

can safely ignore the fact that the models with the controls may be somehow misspecified.

4 Implications for environmental policy

Our empirical results above suggest two broad lessons. Lesson one is that individuals, on average, pretend that others act less altruistic than themselves, and undertake preventive behavior because they want to minimize the impact on themselves or simply because they adhere to the regulation. Of course, this is not possible - if respondents mostly claim that they themselves act for more altruistic reasons, but believe that everyone else acts for more egoistic reasons, then the numbers cannot add up. Conclusively, the respondents either misevaluate their own reasons for social distancing, or they misevaluate the reasons that others have. Either way, this result suggests individuals may not be fully aware of the actual reasons that are driving their or others' behavior, and want to be perceived

as more altruistic than others.[19] We call this *Motivational Misperception.* In the analysis above, we found that Motivational Misperception arises in the form where individuals view themselves as being more altruistically motivated than the rest of society, which they in turn believe to be more egoistically motivated.

The second lesson that we can take away from this is that, when one asks individuals directly, then these individuals do not perceive norms as their main motivator for action. Furthermore, norms also do not figure highly in what respondents believe are the main motivators of others. This has some implications for the literature on social and moral norms, it implies that either social norms may be far less important than researchers tend to think they are; or that individuals fail to *consciously* perceive the influence of norms on their decisions. Our regression results seem to confirm the second possibility: individuals are not fully aware of the underlying social reasons for their choices and, therefore, norms matter. We dub this *Social Context Misperception.* This bias arises because individuals view themselves as being motivated by reasons other than those that arise from social interactions.

We are not the first to observe the existence of the Social Context Misperception. The psychology literature has already studied this phenomenon. For example, Nolan et al. (2008) show that people underestimate the impact of others on their own actions. Cialdini (2005) has nicely summarized this: "What's surprising, given the ubiquity and strength of the evidence, is how little note people take of this potent form of influence at three crucial and often-encountered decision points: when, as observers, they decide how to interpret the causes of their own actions; when, as tacticians, they decide how to influence the actions of others; and when, as experts, they decide whether to seek the input of others." One of the main results in that literature is that individuals tend to severely underestimate the influence of the social context on their actions. Our empirical results above have shown exactly this - both the Motivational Misperception and the Social Context Misperception are statistically important. Clearly, this suggests that this phenomenon is not only applying to Covid-19, but that it is a result that deserves much more attention in the economics

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[19]We ask "What do you think are the motivations of others for social distancing?', we didn't ask "What do you think other people will report as their main motivation for social distancing?." which would have helped clarify whether the likely misevaluation of their motivations comes from misreporting or misperception. The phenomenon known as "introspection illusion" (Pronin et al., 2007) suggest people tend to think they are better at introspecting than others.

literature than it has received up to now.

While much has been said about the implications of social norms on public policy (Nyborg, 2020; Meunier and Schumacher, 2020), and whether policies crowd-out morally motivated actions (Nyborg and Rege, 2003a; Bowles and Hwang, 2008) we are not aware of analyzes of the impact of Motivational Misperception and Social Context Bias. Two lines of inquiry come to mind: the impact of motivational misperception on strategic interactions, and the issue of welfare evaluation of policies based on social norms.

4.1 Motivational Misperception and strategic interaction

Misperception of others' motivation is likely to play an important role in strategic interactions. If social norms or altruism do transform a prisoner dilemma situation into a coordination game, *Motivational Misperception* and the *Social Context Misperception* may prevent agents from coordinating on the good equilibrium. Let us illustrate this point with a simple game, and consider a prisoner dilemma with the following payoffs:

Table 7: The prisoner dilemma

Alice

		Low	High
Bob	Low	$\{0; 0\}$	$\{b_1; b_1 - c\}$
	High	$\{b_1 - c; b_1\}$	$\{b_1 + b_2 - c; b_1 + b_2 - c\}$

There are two players, Alice and Bob, each can decide to make an effort (e.g. emissions reduction, mask wearing). The cost of the effort is c, and if only one player makes an effort this generates a benefit b_1 for both players, while if both players make an effort the benefits are $b_1 + b_2$, b_2 being the additional benefit created by the second player's effort.

Let us assume that

$$b_i < c < 2b_i \text{ for } i = 1, 2$$

so that the unique Nash equilibrium is {Low, Low} whereas {High, High} maximizes total payoffs..

Consider now moral players that value the benefit of their action for the other player.[20] If Alice makes an effort while Bob does not she gets $(1 + a)b_1$ in which a is the moral factor. If Bob decides to make an effort while Alice is already making an effort he gets $b_1 + (1 + a)b_2 - c$. The new moral game becomes:[21]

Table 8: The moral game

Moral Alice

		Low	High
Moral Bob	Low	$\{0; 0\}$	$\{b_1; (1 + a)b_1 - c\}$
	High	$\{(1 + a)b_1 - c; b_1\}$	$\{b_1 + (1 + a)b_2 - c; b_1 + (1 + a)b_2 - c\}$

And if the parameters satisfy :

$$(1 + a)b_2 > c > (1 + a)b_1$$

it is a coordination game with two Nash equilibria, and players only need to coordinate on the right equilibrium.

However, if players misperceived the moral nature of the other player they might be unable to recognize the coordination game and fail to reach the optimal allocation. For instance, considering the point of view of an altruistic Bob, believing he faces a selfish Alice,

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[20]In this example it does not matter whether it is a purely behavioral effect or a true hedonic pleasure, even though we favor the behavioral interpretation.

[21]We do not consider purely altruistic players which explains that the payoffs are not $(1+a)(b_1+b_2)-c$ in the {High, High} situation but $b_1 + (1 + a)b_2 - c$.

he will consider that playing Low is a dominant strategy for Alice and will expect her to do so, and if $(1+a)b_1 < c$ it will then be optimal for Bob to play Low. Misperception will then be self-fulfilling. In our illustrative example it requires that $b_1 < b_2$ and $c/b_2 < a < c/b_1$: actions exhibits strategic complementarity and the moral factor takes intermediary values.

This illustrative example suggests the need of further investigation of the impacts of *Motivational Misperception* and the *Social Context Misperception* in strategic contexts and their policy consequences. For instance, if climate negotiators are subject to these biases, the game above can illustrate climate negotiation and explain sub-optimal Nationally Determined Contributions to climate policy.[22] For instance, we wonder if a similar phenomenon is at stake in the "Prisoner dilemma trap" of Barrett and Dannenberg (2199), in which players rarely choose to play a coordination game rather than a prisoner dilemma even though they will benefit from doing so. Interestingly, in that case the issue seems reversed with people expecting themselves and others to be more cooperative than they actually are.

4.2   Policy evaluation

If people misperceive their true motivations and the influence of their peers, it might be difficult to evaluate the benefits and cost associated with policies, and social nudging in particular. Besides the theoretical debate in behavioral welfare economics about the "right" welfare function and the distinction between "choice utility" and "experience utility" (Bernheim, 2009),[23] misperception will also limit the ability of researchers to elicit the willingness to be exposed to social nudging (Allcott and Kessler, 2019).

The classical issue of evaluation a behavioral policy is the following. Let us denote the choice utility function as $U(C, P, E)$, in which P is a policy intervention, C consumption, and E environmental quality which depends on C (or health or any impact of C on utility

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[22]We fully acknowledge that our sample is not representative, and that our results might not apply to climate negotiators.

[23]A related issue concerns the misperception of risk, as studied in Salanié and Treich (2009) who distinguish two policy makers, a "paternalistic" and a "populist" one, and who differ in whether they maximize welfare with the objective or biased evaluations of risk (see also Johansson-Stenman, 2008). Evaluation of nutrition policies that are partly justified by behavioral and informational biases, as done by Irz et al. (2015, 2016), raise similar difficulties (Meunier, 2019).

not well internalized by people). In the benchmark situation without a policy, ie $P = 0$, the individual chooses $C(0)$ by maximizing his utility U but ignoring the impact of C on E (ie $\partial E/\partial C = 0$) and gets $U(C(0), 0, E(C(0)))$. We know that this is not optimal. A policy intervention P will change C to $C(P)$ that maximizes $U(C(P), P, E)$, but again ignoring the impact of C on E. The agent might experience utility $U(C(P), 0, E(C(P)))$ and not $U(C(P), P, E(C(P)))$ (he does not value the behavioral manipulation of the policy), and therefore it is not clear which function to use to evaluate the policy. Indeed, if both $U(C(P), P, E(P)) > U(C(0), 0, E(0))$ and $U(C'(P), 0, E(P)) > U(C(0), 0, E(0))$ then we would know that this corresponds to a pareto improvement for *any* preference that the individual would have. While this approach cannot rank all policies, it at least allows us to rank some of them.

A further problem arises if we now introduce the misperception of the policy impact and we were to ask people their willingness to be exposed to the policy. Then even though people value the $\{C(P), E(P)\}$ allocation more than the $\{C(0), E(0)\}$ one, and acknowledge the direct influence of the policy on their experience utility. The reason is that they still misperceive its impact on the choice as they compare $U(C(P), P, E(P))$ with $E(C(P,), 0, E(P))$ instead of $U(E(C(0), 0, E(0))$, which will likely bias the evaluation.

As a final point, there is an additional difficulty for environmental policy that we want to draw attention to. Clearly, if individuals misperceive the importance of norms for their own actions, then this introduces significant difficulties for policy interventions, as discussed above. However, an additional aspect is that norms themselves are unlikely to lead to an efficient outcome (Meunier and Schumacher, 2020), and thus there is room for policy intervention despite the relevance of norms, and even despite norms going 'in the good direction'.

5   Conclusions

Social distancing shares similarities with pro-environmental behaviors as in both cases these behaviors are associated with positive externalities. The analysis of the drivers underlying an individual's adoption of social distancing are then likely to offer insights into the drivers underlying pro-environmental actions. In both cases, the motivations of people is likely to be not solely determined by their own health and material conditions. In order to analyze

the drivers of social distancing during the Covid-19 pandemic, as well as the motivators underlying the willingness to invest in green expenditure, we conducted a survey in France and Luxembourg. We asked questions about the intensity of social distancing together with questions about own motivations and an evaluation of the potential motivators of others to evaluate personality traits ('motivators') and attitude toward social distancing and the environment. Could with a standard set of questions that capture socio-economic characteristics we obtained responses from 1,356 people.

Our main finding is that individuals misperceive not only their own motivators for social distancing, but also other people's motivators for social distancing. More than half of the respondents view themselves as being more altruistic than others, and believe that others tend to be mostly motivated by self-concern or because they simply want to adhere to regulation. In addition, only five percent of the respondents acknowledge that their choices underlying social distancing are influence by norms (both moral and social) even though our regression analysis suggests that norms tend to be among the statistically most important motivators. This last result holds for both social distancing as well as the willingness to invest in environmental expenditure.

We label these two phenomena *Motivational Misperception*, which arises if individuals view themselves as being more altruistic than others, and *Social Context Misperception*, which applies if individuals neglect, or underestimate, the importance of norms for their decisions. We show that these insights are coherent with results in the psychology literature, such as Nolan et al. (2008), Haidt (2001), Latané and Nida (1981) or Pronin (2009). We argue that these misperceptions have critical implications for environmental policy, in particular for strategic issues such as cooperation or coordination, but also for welfare evaluations of policy changes. First, Motivational Misperception may limit the ability of people to cooperate because they are unaware of the norm motivator influencing the decisions of their counterpart. We show that this may lead to the selection of pareto inferior equilibria. This naturally has repercussions for noncooperative games such as the setting of Nationally Determined Contributions. If all policy makers believe that the other countries contributions will be set based on a self-centered, egoistic motivation, and that altruism or norms don't play a role for the others, then it is very likely that countries will coordinate on an equilibrium that falls significantly short of the mitigation action that is needed to minimize warming to 1.5 degrees. Furthermore, if policy makers themselves are

unaware that they are susceptible to social norms, then they may be more likely to build policies using instruments that are more hierarchical and thus regulatory heavy, instead of focus on the development of norms that induce individuals to coordinate on the good equilibrium themselves. However, as we have seen, regulation or hierarchy may in fact lead to an individually lower willingness to invest in green expenditure.

In addition, the evaluation of social nudging programs might be complicated if people are unable to assess the true influence of such programs on their behavior. A question obviously arises to what happens to efficiency if the utility function that individuals use is different from the one they believe that they are using. As the two misperceptions that we find seem to play an important role, it could be that this requires policy interventions. However, it is not a simple task to figure out which utility function should be chosen for this policy intervention - the utility function that individuals think they are using, or the utility function that they are actually using? This, naturally, has significant repercussions for the acceptance of policy interventions, but also for the effect and effectiveness.

A clear caveat of our analysis is that the survey was not fully representative. However, results in the psychological literature are closely in line with what we found here (Nolan et al., 2008; Haidt, 2001; Latané and Nida, 1981; Pronin, 2009), suggesting that the misperceptions that we identified apply in more general environments, too. We believe, thus, that our findings should deserve a further analysis along several lines. For example, numerous issues associated with moral and social norms have received attention in the literature, notably about coordination in the presence of social norms, as well as the risk of crowding-out of policies. The influence of behavioral biases on taxation and nudging policy have also received attention recently (see Farhi and Gabaix, 2020; Carlsson and Johansson-Stenman, 2019, and reference there in). However, we are not aware of research that consider the impact of our two perception biases, namely *Motivational Misperception* and *Social Context Misperception*, both of which are related to the difficulties that people have to assess the drivers of their actions and the drivers of other people's actions. While this phenomenon has been studied in the literature in psychology, we notice a gap in the economics literature. Our suggestion would be to carefully study how these misperceptions affect the spreading of norms through society, as well as implications for equilibrium coordination and cooperation.

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Table 9: Variable description: indirect measures of motivators

Variable	Description
Egoism	Are you similar to this fictitious person: This person would like to be successful and that other people recognize her/his achievements.? (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person would like to be rich in order to buy expensive things? (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person would like to be rich in order to buy expensive things? (1 - not at all similar, 4 - very similar)
	How important it is in your life: wealth? (1 - not at all important; 4 very important)
Regulation	Are you similar to this fictitious person: This person tries to avoid everything dangerous and prefers a safe environment. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person loves risk and adventure and wants to live an exciting life. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person respects the traditions that she/he learnt from society. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: This person is careful to follow laws and regulations, even if they don't always make much sense. (1 - not at all similar, 4 - very similar)
	Are you similar to this fictitious person: It is important for this person to be creative and do things in his/her own way. (1 - not at all similar, 4 - very similar)
	Do you agree: Imagine you were a soldier and disagreed with the commanding officer's orders, would you obey anyway because it is your duty? (1 - never, 4- always)
Social norm	Are you similar to this fictitious person: This person believes that if most people do something then it must be the correct thing to do. (1 - not at all similar, 4 - very similar)
	Do you agree: A very close friend offers you a hat for your birthday, yet you don't wear hats. Would you start wearing one ? (1 - never, 4- always)
	Do you agree: Imagine you arrive at a dinner wearing a t-shirt while all your friends are dressed up (skirt, shirt). Would you feel embarassed? (1 - never, 4- always)
	Are you similar to this fictitious person: This person wants to always do the right thing to minimize conflict with others. (1 - not at all similar, 4 - very similar)
	How important it is in your life: Voluntary work (in your commune, for the environment, animal rights). (1 - not at all important, 4 - very important); multiplied by *others* dummy
	This person takes care of family and relatives despite high personal costs. (1 - not at all important; 4 very important); multiplied by *others* dummy
Altruism	How important it is in your life: Help people in poor, developing countries financially. (1 - not at all important; 4 very important)
	Do you agree: Do you help a stranger to pick up something (s)he dropped? (1 - never, 4- always)
	Do you agree: Do you give money to homeless people? (1 - never, 4- always)
	Do you agree: Do you give money to charities? (1 - never, 4- always)
	Do you agree: Do you help people if you see they are in need of help? (1 - never, 4- always)
Moral norm	How important it is in your life: Voluntary work (in your commune, for the environment, animal rights). (1 - not at all important, 4 - very important); multiplied by (1-*others*) dummy
	Do you agree: Do you try to reduce your flights and your travel by car to reduce your carbon emissions? (1 - never, 4- always)
	Do you agree:Do you pick up litter from the street? (1 - never, 4- always)
	Do you agree: Imagine you scratch another car while leaving your supermarket parking slot, yet nobody saw this. Would you leave a note ? (1 - never, 4- always)
	Do you agree:Imagine you find a wallet with 30 euros, and a business card with a phone number. Would you call the number to return the money? (1 - never, 4- always)
others	How important is this in your life: what others think about you (1- not at all important, 4 - very important); recoded as a dummy (category 1&2 recoded as 0; category 3&4 recoded as 1)

Table 10: Variable description

Variable	Description: direct measures of motivators
SD	Imagine the government would not enforce a lockdown anymore, but would instead only strongly suggest to continue social distancing and wearing masks until the pandemia is over. Would you wear a mask in crowded public spaces? (1- would not at all, 4 - would do as much as possible)
green	Would you be happy if petrol prices are doubled to reduce climate change? (1 - not at all happy, 4 - very happy)
	Would you be happy with a 10% raise in national taxes to help finance the green transition in your country?? (1 - not at all happy, 4 - very happy)
	In the aftermath of the Covid-19 crisis should the stimuli go to the economy or the environment? (1- economy, 100 - environment)
motivators	What are your personal motivations for social distancing? (categories: avoid being sick because of possible personal health consequences - *own impact*; avoid being sick for helping to reduce the spread of Covid-19 to family members, relatives or friends - *impact relatives*; avoid being sick for helping to reduce the spread of Covid-19 to society in general - *impact society*; because it is government regulation - *regulation*; Do as other people do / It feels right / Because other people will appreciate this - *other*); recoded as dummy variables where the category names are in italics and the variables take a 1 if an individual chose this motivator as his/her main motivator
motivators others	What do you think is the most important motivation of others for social distancing? (categories: avoid being sick because of possible personal health consequences - *own impact*; avoid being sick for helping to reduce the spread of Covid-19 to family members, relatives or friends - *impact relatives*; avoid being sick for helping to reduce the spread of Covid-19 to society in general - *impact society*; because it is government regulation - *regulation*; Do as other people do / It feels right / Because other people will appreciate this - *other*); recoded as dummy variables where the category names are in italics and the variables take a 1 if an individual chose this motivator as the main motivator of others

Table 11: Variable description: Socio-economic controls

Variable	Description
age	corresponds to actual age of respondent
children	How many children do you have?
gender	0 = male, 1 = female
country	Which country do you live in currently? (France, Luxembourg)
climate change	Please state how concerned you are about climate change? (1 - not at all concerned, 4 - very concerned)
local environ.	Please state how concerned you are about local environmental quality? (1 - not at all concerned, 4 - very concerned)
income	In which income group was your monthly net salary in 2019? (categories: no income; 0-500 euros; 500-1000 euros; 1000-1500 euros; 1500-2000 euros; 2000-2500 euros; 2500-3000 euros; 3000-4000 euros; 4000-6000 euros; over 6000 euros); recoded as dummies for each category.
house	Would you say you live in a...? (categories: a house with a garden, a house without a real garden, a small apartment, a comfortably sized apartment); recoded as dummies for each category)
house2	Would you say you live more in a? (categories: an area with lot's of nature around and few people, an area with nature around but many people, an area without much nature and many people); recoded as dummies for each category)
schooling	What is the highest degree or level of schooling that you have completed? (Less than a high school diploma, High school diploma or equivalent, Bachelor degree, Master degree or MBA, PhD or Professor); recoded as dummies for each category)
health	How would you rate your health during the past year? (1 - very poor; 5 - very good)
risk-group	Would you say you belong to a Covid-19 risk group? (0 - no, 1 - yes)
household	How many people are living in your home? (including yourself)
work	During the lockdown, did you work from home or did you have to work on site (e.g. in the office)? (work from home, on site (e.g. in the office), traveling by public transport, on site (e.g. in the office), traveling by own means of transport, furloughed, unemployed, retired, not in employment); recoded as dummies for each category)

Table 12: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
green	1356	.521	.5	0	1
mask	1356	.886	.317	0	1
Egoism	1356	2.802	.581	1.196	4.786
Social norm	1356	2.198	1.262	.176	4.345
Altruism	1356	3.106	.656	1.418	4.882
Moral norm	1356	3.515	.687	1.179	5.202
Regulation	1356	2.666	.579	1.274	4.629
climate change	1356	.814	.389	0	1
local env. qual.	1356	.847	.36	0	1
children	1356	1.159	1.285	0	6
mask discomfort	1356	.257	.437	0	1
effective	1356	.914	.28	0	1
gender	1356	.737	.441	0	1
age	1356	44.423	16.03	17	89
income	1356	4.379	2.41	1	9
virus (colleagues)	1356	1.628	.806	1	3
Contact (live alone)	1356	.163	.369	0	1
Contact (a lot less)	1356	.022	.147	0	1
Contact (somewhat less)	1356	.101	.301	0	1
Contact (same)	1356	.605	.489	0	1
Contact (more)	1356	.08	.272	0	1
Contact (much more)	1356	.029	.167	0	1
area (much nature, many people)	1356	.331	.471	0	1
area (much nature, few people)	1356	.317	.466	0	1
area (little nature, many people)	1356	.352	.478	0	1
house (small apartment)	1356	.224	.417	0	1
house (big apartment)	1356	.254	.435	0	1
house (house, garden)	1356	.473	.499	0	1
house (house, no garden)	1356	.049	.215	0	1
schooling (A-level)	1356	.222	.416	0	1
schooling (bachelor)	1356	.268	.443	0	1
schooling (master)	1356	.296	.457	0	1
schooling (PhD)	1356	.107	.309	0	1
schooling (less than A-level)	1356	.106	.308	0	1
work (furloughed)	1356	.071	.257	0	1
work (work from home)	1356	.436	.496	0	1
work (not employed)	1356	.112	.316	0	1
work (unemployed)	1356	.086	.28	0	1
work (retired)	1356	.156	.363	0	1
work (on site, private transport)	1356	.128	.335	0	1
work (on site, public transport)	1356	.011	.105	0	1
Harm (relatives)	1356	.501	.5	0	1
Harm (world)	1356	.585	.493	0	1
Harm (country)	1356	.597	.491	0	1
France	1356	.852	.355	0	1
Luxembourg	1356	.148	.355	0	1

Table 13: Cross-correlation table

Variables	Egoism	Social norm	Altruism	Moral norm	Regulation
Social norm	0.1606				
Altruism	-0.1267	0.1601			
Moral norm	-0.3015	-0.2200	0.4346		
Regulation	0.1573	0.2644	-0.0854	-0.2087	

Table 14: Main regression results

Model	(1)	(2)	(3)	(4)
Dep. var.	Masks *without controls*	Masks *with controls*	Green *without controls*	Green *with controls*
	Coef./S.e.	Coef./S.e.	Coef./S.e.	Coef./S.e.
Egoism	-.126	-.081	-.195*	-.370***
	(.1291)	(.1074)	(.1160)	(.1207)
Social norm	.141***	.162***	.195***	.110***
	(.0328)	(.0481)	(.0231)	(.0298)
Altruism	.112***	.057	.273***	.234***
	(.0330)	(.0617)	(.0728)	(.0428)
Moral norm	.029	.059	.497***	.513***
	(.0744)	(.0604)	(.0451)	(.0338)
Regulation	.419***	.395***	-.156***	-.041
	(.0196)	(.0115)	(.0059)	(.0347)
Mask discomfort		-.564***		
		(.0799)		
Effective		.850***		
		(.2256)		
Harm (relatives)		.296***		
		(.0401)		
Harm (world)		.508***		
		(.1450)		
Harm (country)		-.029		
		(.0268)		
Risk group		.181***		
		(.0189)		
Climate change				.853***
				(.0546)
Local env. qual.				.300***
				(.0536)
Constant	-.249	-1.162	-2.004***	-1.455***
	(.5861)	(.9510)	(.2882)	(.5010)
+ additional socio-economic controls				
Constant	-.607	-1.465	-1.739***	-1.458***
	(.5460)	(.9049)	(.1584)	(.3484)
Pseudo R^2	.057	.231	.110	.224
Obs.	1356	1356	1356	1356
log likelihood	-452.4	-369.0	-835.2	-728.0
HL test (chi2)	5.552	9.127	6.818	22.507
HL test (p-val)	.697	.332	.556	.004
LM test (chi2)	.946	284.858	.007	42.484
LM test (p-val)	.331	.000	.933	.000

Remark: Robust standard errors in parentheses. * p<0.1 , ** p<0.05 , *** p<0.01.