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Article

'I Do It for Others'! Prosocial Reasons for Complying with Anti-COVID Measures and Pro-Environmental Behaviours: The Mediating Role of the Psychological Distance of Climate Change

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Abstract: The present study examined whether prosocial reasons to comply with anti-COVID measures were related to pro-environmental behaviours (PEB), as both have in common that they were/are mostly performed to help others. We investigated two mediating psychological mechanisms: perceived interdependencies between the self and others, and reduced climate change psychological distance. Latent class analyses applied to data from an online study conducted in France, Switzerland, the UK, and Spain ($N_{tot} = 967$) revealed five different 'environmental' profiles. Path models showed that prosocial reasons for complying with anti-COVID measures were related to the most congruent profiles (the 'strongly committed', frequent PEB/strong pro-environmental intentions, and the 'strongly disengaged', infrequent PEB/low intentions) through a reduced vs. heightened psychological distance of climate change. Prosocial reasons were not related to the three other profiles. However, a reduced vs. heightened psychological distance between COVID-19 and the self was related to perceived interdependencies, which were then related to the two most incongruent profiles: the 'well-meaning' and the 'committed to private PEB'. We discuss these results to the extent that they inform on (a) the relevance of using a profile-approach, (b) the way to measure the psychological distance of different global crises, and (c) the relevance of pursuing research on perceived interdependencies as predictors of PEB.

Keywords: COVID-19; anti-COVID measures; climate change; pro-environmental behaviours; perceived interdependencies; collective self-construals; psychological distance; Construal Level Theory; latent class analysis



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1. Introduction

During the first months of 2020, the COVID-19 pandemic required humans to modify their everyday behaviours in a matter of weeks. In most countries in the world, mitigative actions were required from citizens (e.g., social distancing and self-quarantining) and lockdowns were enforced. Most individuals complied with these very strict and most often unprecedented measures (e.g., [1]), which is 'even more striking given that most individuals feel that risks associated with contracting the virus [were] greater for others than for themselves' ([2], p.194). Thus, protecting others seems to have motivated a share of the population. Why do similar motivations not lead to the actions needed to protect the future of humankind, which is threatened by climate change? Indeed, while it is now scientifically established that human activity on Earth is affecting climate and that CO₂ emissions must be drastically reduced, most economic, public, and individual actors have not (or not sufficiently) changed their behaviours yet [3,4].

Following other scholars [5,6], we assumed that the COVID-19 crisis could have affected their perceptions of climate change. In the present study, we focused on the reasons individuals complied with anti-COVID measures. We hypothesized that those who considered the welfare of the whole society beyond their own to adopt anti-COVID measures should develop strong intentions to act towards the environment (even when they are already engaged in such behaviours) because it would have both bolstered perceived interdependencies between the self and others, and reduced the psychological distance of climate change. These hypotheses were pre-registered and then tested in an online study conducted in four European countries in May and June 2020: Switzerland ($N = 316$), France ($N = 243$), Spain ($N = 204$), and the United Kingdom ($N = 204$).

1.1. Reasons for Engaging in Anti-COVID Measures

When COVID-19 spread across the world and became officially a pandemic in the early months of 2020 [7], strict rules were enforced in most countries. Individuals were, for instance, asked to stay at home, to maintain social distance (the exact distance varied across countries) if they had to meet others, to wash their hands frequently, not to travel, to wear a facemask in public, etc. Most complied, thus slowing down the diffusion of the disease. There were indeed more deaths ‘in regions that did not prioritize measures to contain the virus and protect vulnerable populations’ (see [5]). Various studies were conducted early in the pandemic to investigate the factors underlying individuals’ willingness to comply vs. to cheat regarding anti-COVID measures. Individual- (e.g., lack of trust in government [8,9] and a low capacity of anticipating the future [10]) and contextual-level variables (e.g., trust at the regional level [11] and low social capital [12]) were pinpointed as factors leading individuals not to comply with anti-COVID measures.

Several explanations regarding why people complied with the measures have been put forward. An online study conducted in North America and Europe showed that individuals cited protecting others (86%) and themselves (84%) as motivations [13]. A sense of responsibility to protect their community was also frequently cited (84%). A study conducted in 23 countries further found that individualizing moral foundations (fairness and care, ‘that primarily refer to the importance of protecting other individuals’, p. 4; see [14]) indirectly predicted compliance with anti-COVID measures through heightened trust in science [9]. One might wonder whether protecting others from COVID-19 impacted individuals’ willingness to engage in pro-environmental behaviours (PEB), defined as ‘the commission of acts that benefit the natural environment (e.g., recycling) and the omission of acts that harm it (e.g., avoid air travel)’ ([15], p. 92). As developed in the next two sections, we created the hypothesis that people who complied with anti-COVID measures for prosocial reasons reported stronger interdependencies between humans, and perceived climate change as closer—which were both expected to relate to a higher commitment to PEB.

1.2. Perceived Interdependencies

Self-construals—that is, the way individuals define themselves [16]—range from independent (from others) to interdependent [17]. ‘Others’ can be close ones (relational self) or more collective entities (collective self [18]). While some types of self-construals are more frequently found and expressed in some cultures (e.g., independent self-construals in individualist countries), interindividual differences exist. While partly stable within individuals, self-construals are also known to be partly malleable. Priming experiments were shown to provoke shifts in self-construals, which further impacted participants’ values and judgements [19]. During the first months of the COVID-19 crisis, a strong emphasis was placed on interdependencies between countries and humans: the virus was able to spread quickly from one continent to another, from one individual to another [20]. In a theoretical article, Bouman and colleagues [2] made the hypothesis that ‘public responses to COVID-19 were partly promoted by strong personal norms: feeling morally compelled and responsible to act’ (p. 194). Personal norms are indeed defined as a personal sense

of obligation to engage in some behaviours, for instance to contribute to mitigate climate change [21]. Building on this assumption, in the present study, we hypothesized that complying with anti-COVID measures for prosocial reasons would be related to a stronger collective self-construal (H1), thereby reflecting perceptions of interdependencies.

By combining two major global crises, we also believed that this heightened sense of perceived interdependencies would impact individuals' willingness to address another major scale threat—climate change. Climate change is a global and complex challenge for humankind, with the consequences of behaviours in some places being more apparent in other places, and in the decades to come. Thus, actions to mitigate climate change are often seen as primarily taken for 'others' (that is, future generations, other places, and/or other species [22]). This may explain why perceiving oneself as a citizen of the world or feeling connected with the whole humanity has been repeatedly shown to be associated with pro-environmental attitudes and behaviours (for a review, see [23]). Similarly, having self-transcendent values—that emphasize 'concern for the welfare and interests of others (universalism, benevolence' [24], p. 8)—relate to individuals' willingness to engage in PEB (e.g., [25,26]). For these reasons, we expect heightened perceived interdependencies between the self and others to be related to more frequent PEB (H2).

1.3. Psychological Distance

In addition to perceived interdependencies, we considered a second factor that may have been impacted by engaging in anti-COVID measures for prosocial reasons: a reduced psychological distance of climate change. Lieberman and colleagues [27] describe psychological distance as an inevitable consequence of human perception of life. Every event, concept, or emotion fits into a construal that is held in relationship to the self. The main idea, central to Construal Level Theory (CLT [28]), is that abstraction level (as opposed to concreteness) is directly linked to the proximity of a construal. Over the years, many studies have been conducted in order to create a classification of the different psychological distance types, which can be boiled down to four types: spatial, temporal, hypothetical, and social. Indeed, an object can be perceived as distant in space (e.g., in another country), distant in time (e.g., in the distant future), as uncertain, and as not impacting people one knows.

Climate change is generally seen as psychologically distant, although interindividual differences do exist (for reviews, see [29–32]). In addition, the average psychological distance of climate change may have been increased during the COVID-19 crisis (see [33,34]). For instance, Botzen and colleagues [35] argued that because of the 'finite pool of worry' [36]—a theory used to explain decreases of concern for climate change after major events—COVID-19 may have been seen as a more pressing matter (see, however, [37]). For this reason, in the present research, we made no assumption regarding the general psychological distance of climate change during Spring 2020 compared to prior levels. Instead, we focused on the relationship between individuals' propensity to engage in anti-COVID measures for prosocial reasons and interindividual differences in perceptions of climate change. Individuals' personal psychological distance of climate change is known to be affected by real events or depictions of possible events, although some variability in these effects have been reported [29–32]. For this reason, we expected complying with anti-COVID measures for prosocial reasons to be related to a reduced psychological distance of climate change (H3), which, in a turn, was hypothesized to relate to stronger PEB (H4).

1.4. Hypotheses

As developed in the previous sections, the goal of the present study was to examine to what extent engaging in anti-COVID measures for prosocial reasons in the first months of the pandemic was related to PEB. Two mediating processes were considered: increased perceived interdependencies between the self and others, and a reduced psychological distance of climate change. Regarding the latter, COVID-19 went, in a few months, from an issue in a distant country that may hypothetically have impacted the countries under

investigation to something concrete, happening where our participants lived (i.e., in European countries) and impacting them or people they knew. For these reasons, we focused on the hypothetical and social dimensions of psychological distance. In addition, while the present study did not focus on the psychological distance of COVID-19, we also explored the role it could have played in explaining the mediating processes we investigated in the between study.

Instead of considering PEB, or the intentions to perform them, as variables to be explained, we relied on a person-centred approach (regarding their use in psychological research, see [38]). By doing so, instead of considering self-reported behaviours and intentions to perform PEB in the future as separate constructs, both were mixed to catch more subtle ways to describe one's relationship with one's actions taken for the environment. Latent profiles have increasingly been used in research on pro-environmental attitudes and behaviours [39]. While the number of profiles revealed vary as a function of the concepts and context considered, in the great majority of cases, more than two profiles were found [39], highlighting the complexity of the psychological reactions to climate change. We, thus, expected to see at least four profiles to emerge: in addition to two congruent profiles (i.e., 'the committed': frequent PEB/strong intentions, and 'the disengaged': infrequent PEB/weak intentions), more incongruent patterns were also likely to emerge (e.g., 'the well-meaning': infrequent PEB, but strong intentions to 'perform better'). The two most likely profiles (as PEB are generally expected from individuals) were preregistered as dependent variables, i.e., the 'committed' and 'the well-meaning' (see Section 2.1). In addition to these two pre-registered profiles, other relevant profiles could be chosen as dependent variables, depending on our analyses (see Figure 1). For instance, it could be relevant to examine whether pro-social reasons for complying with anti-COVID measures were negatively related to more 'disengaged' profiles.

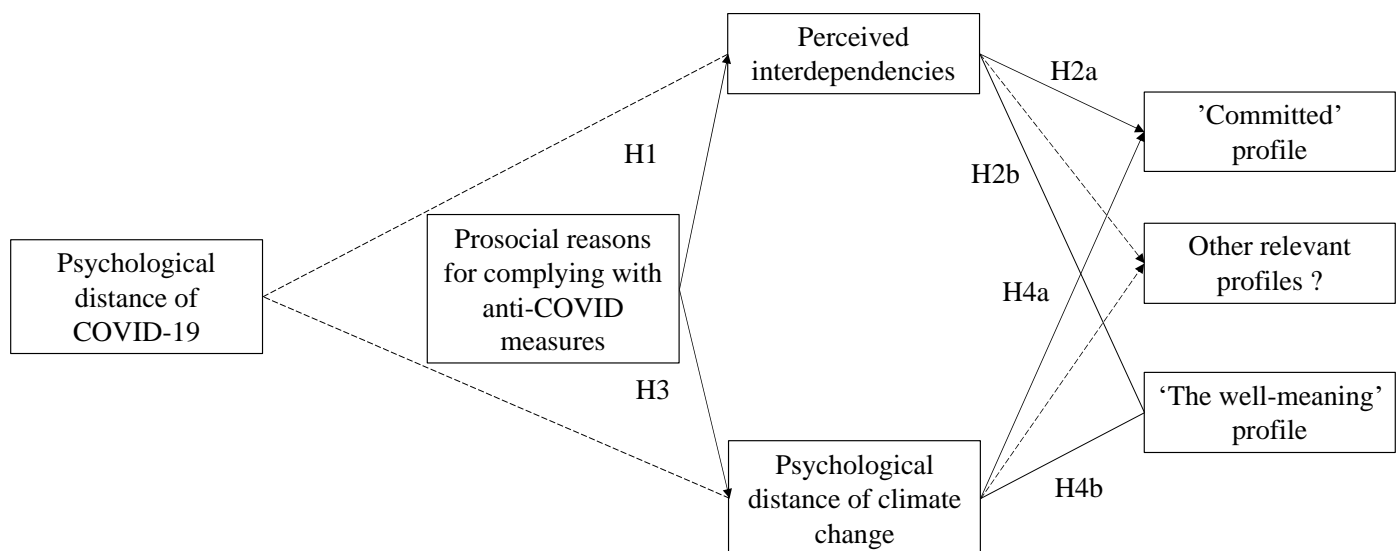


Figure 1. Summary of hypotheses.

2. Materials and Methods

2.1. Procedure and Participants

Data were collected in different national settings (Switzerland, France, Spain, and UK) to avoid the impact of locally situated discourses linking responses to both climate change and COVID-19, but we had no specific hypotheses regarding cross-country differences. In these four countries, partial or full lockdowns were in force from around mid-March 2020, and citizens had to follow various mitigative behaviours.

Our expectations were pre-registered (aspredicted#40438) before launching the data collection. The project also received ethic approval from the Faculty of Social and Political

sciences from the University of Lausanne. From 11 May to the 6 June 2020, participants were recruited by snowball sampling (post on social media, etc.), paid ads on social media (in France, Spain, and the UK), and for credit completion (during a methodology course, in Switzerland). Participants were told that the survey was anonymous, that they did not have to answer to all questions, and that they could drop out at any time.

Power analyses for indirect paths [40] indicated that the minimum sample size per country should be 203. Altogether, 1700 people started filling in the online questionnaire, 1020 of which completed it. Among them, 15 did not indicate where they lived and five lived in countries other than those under investigation (three participants in the US, one in Cyprus, and one in Germany). Among the 1000 remaining, 33 participants took the 'wrong' survey (e.g., Swiss residents filling in the French survey). As the anti-COVID measures differed across countries, these participants were removed from the database, leaving a final sample size of 967 (Switzerland, $N = 316$; France, $N = 243$; Spain, $N = 204$ and UK, $N = 204$). Detailed information about each country sample is given in Table 1.

Table 1. Sample characteristics, in general and by country.

	General	Switzerland	France	Spain	UK
	M SD/%	M SD/%	M SD/%	M SD/%	M SD/%
Male participants %	26.16%	20.57	27.98%	31.37%	27.45%
Age	45.29 (16.48)	36.12 (14.08)	49.81 (13.30)	44.99 (16.86)	54.42 (15.83)
Occupation					
Employed	59.21%	61.81%	68.37%	53.16%	49.48%
Studying	15.26%	29.82%	5.10%	9.49%	8.85%
Access to outside	86.14%	85.76%	84.44%	80.00%	94.47%

Sample characteristics are provided in Table 1. In all countries, the samples were predominantly female. Participants were on average younger in Switzerland, followed by Spain, France, and the UK. This may be partly explained by the greater proportion of students in the Swiss sample (which was below 10% in the other three countries). The proportion of participants presumed to have access to outside (i.e., they lived in a house or in a flat with a balcony) was high across the four countries.

2.2. Measures

The online questionnaire consisted of 116 items (the UK version of the questionnaire is available in Supplementary Material S1). Several online meetings were organized between the co-authors in April 2020 to select the items. When possible, existing items and translations were used. Scales were presented in the following order: Participant-related information (socio-demographics (see above), political orientation, human values, general social desirability, COVID-19-related items (psychological distance of COVID-19, self-rated health, presence of COVID-19 symptoms among participants and their friends and family, perception of the COVID-19 crisis, subjective knowledge of the COVID-19, COVID-19 information research, anti-COVID measures: frequency of adoption, reasons for adoption and reasons for non-adoption), perceived interdependencies between the self and other, and environmental-related items (environmental social desirability, psychological distance of climate change, behavioural intentions and self-reported behaviours, and self-rated impact of COVID-19 crisis on environmental concern). In the following, only the items used in the analyses are described, but all items along with their frequencies or means and standard deviations by country can be found in Supplementary Material S2. Means and standard deviations, in total and per country, of the scores or items used in the analyses are presented in Table 2.

Table 2. Means and standard deviations, or percentage of ‘yes’ answers, of the variables used in the analyses, in general and per country.

	General	Switzerland	France	Spain	UK
	M SD/%	M SD/%	M SD/%	M SD/%	M SD/%
Reasons to comply with anti-COVID measures					
Prosocial	5.20 (1.00)	5.25 (0.80)	5.08 (1.14)	5.23 (1.04)	5.27 (1.05)
Personal	4.85 (1.36)	4.79 (1.29)	4.82 (1.44)	4.79 (1.36)	5.03 (1.37)
Perceived interdependencies					
Other-related self	4.34 (0.79)	4.47 (0.72)	4.15 (0.85)	4.35 (0.76)	4.37 (0.84)
PD: climate change	4.70 (1.00)	4.66 (0.86)	4.59 (1.18)	4.85 (0.89)	4.73 (1.04)
PD: COVID-19					
Personal	4.33 (1.16)	4.11 (1.07)	4.22 (1.27)	4.44 (1.14)	4.70 (1.08)
General	5.27 (1.06)	5.24 (0.99)	5.09 (1.15)	5.30 (1.06)	5.50 (1.01)
Symptoms (% yes)					
Personal	12.88%	10.79%	10.74%	17.16%	14.36%
Close others	50.41%	55.87%	41.15%	52.94%	50.49%
COVID worry	4.07 (1.30)	3.96 (1.19)	4.05 (1.42)	4.58 (1.21)	3.74 (1.29)
Human values					
Conservation	4.45 (1.07)	4.48 (0.91)	4.36 (1.19)	4.52 (1.12)	4.47 (1.11)
Universalism	5.49 (0.69)	5.52 (0.59)	5.40 (0.84)	5.62 (0.52)	5.45 (0.77)
Benevolence	5.59 (0.69)	5.62 (0.61)	5.48 (0.82)	5.69 (0.59)	5.58 (0.71)
Social desirability					
General	3.90 (0.81)	3.85 (0.74)	4.15 (0.87)	3.86 (0.74)	3.75 (0.84)
Environmental	4.51 (0.94)	4.45 (0.91)	4.61 (0.93)	4.54 (1.03)	4.47 (0.91)
Self-rated impact of COVID crisis on concern for climate change					
	4.24 (1.30)	4.17 (1.13)	4.34 (1.50)	4.55 (1.24)	3.92 (1.25)
Self-reported PEB ¹					
Educating oneself	53.12%	53.35%	57.02%	56.72%	44.61%
Signing petition	47.64%	47.92%	48.33%	50.25%	43.84%
Talking	49.95%	51.12%	51.24%	54.77%	41.87%
Lowering heating	68.30%	53.50%	79.34%	79.31%	67.00%
Pro-environmental intentions ²					
Only local products	4.56 (1.63)	5.07 (1.24)	5.02 (1.50)	4.34 (1.66)	3.46 (1.71)
Giving up plane	3.87 (1.89)	4.02 (1.74)	4.36 (1.90)	3.48 (1.90)	3.45 (1.92)
Volunteering	3.48 (1.81)	3.37 (1.71)	3.31 (1.89)	3.84 (1.79)	3.50 (1.82)
Ecological bank	4.05 (1.75)	4.16 (1.66)	4.00 (1.80)	4.10 (1.76)	3.89 (1.80)
No wrapped plastic	4.67 (1.44)	4.79 (1.23)	4.74 (1.53)	4.79 (1.43)	4.26 (1.56)
Bike use	3.35 (1.82)	3.31 (1.78)	3.33 (1.88)	3.57 (1.75)	3.22 (1.86)
Env. friendly mat.	4.93 (1.56)	4.61 (1.43)	4.71 (1.64)	4.18 (1.59)	4.35 (1.58)
Protesting	3.68 (1.96)	3.57 (2.00)	3.42 (2.04)	4.13 (1.81)	3.72 (1.87)

¹ Percentage of participants who responded ‘I am already doing it’; ² ‘I am already doing it’ responses were replaced with 6.

2.2.1. Independent Variables

Participants were invited to state to which extent they followed four anti-COVID measures, from 1 (not more than usual) to 6 (extremely more than usual): social distancing, no social gathering (with an exception in Spain—see Supplementary Material S2), washing their hands, and staying at home. Exact measures corresponded to those in force at the time in each country. Participants were then asked to which extent, from 1 (not at all determining) to 6 (completely determining), three different reasons influenced the adoption of these measures: to protect themselves (i.e., m1_reas1, m2_reas1, m3_reas1, and m4_reas1), their family and friends (i.e., m1_reas2, m2_reas2, m3_reas2, and m4_reas2), and to break the infection chain (i.e., m1_reas3, m2_reas3, m3_reas3, and m4_reas3). A component factor analysis, with oblimin rotation, showed two factors with an eigenvalue superior to 1 (see Supplementary Material S3). A first factor related to participants’ willingness to protect people they personally knew (friends and family; 4 items) and to break the infection chain (4 items; $\alpha = 0.92$; $\alpha_{CH} = 0.87$, $\alpha_{FR} = 0.93$, $\alpha_{SP} = 0.93$, $\alpha_{UK} = 0.94$). This score constituted our

independent variable (i.e., following anti-COVID measures for prosocial reasons). A second factor comprised the four items related to participants' themselves ($\alpha = 0.91$; $\alpha_{CH} = 0.91$, $\alpha_{FR} = 0.93$; $\alpha_{SP} = 0.88$; $\alpha_{UK} = 0.93$). This score was used as a control variable. As apparent in Table 2, on average, both types of reasons—prosocial and personal—were perceived to be quite determined to comply with measures. The importance of prosocial reasons was, however, higher than that of personal reasons ($t(962) = 11.52, p < 0.001$).

2.2.2. Mediating Processes

Perceived interdependencies were measured with 12 items inspired by Brewer and Chen's theoretical framework [18], which were created and translated for the present study. Three dimensions of the perceptions of self were measured: individual, relational, and collective. For each dimension of self, the items used related to four aspects: self-definition (inter1 to inter3), agency (inter4 to inter6), values (inter7 to inter9), and self-representations (inter10 to inter12). A principal component analysis, with oblimin rotation, revealed that three factors obtained an eigenvalue superior to 1 (see Supplementary Material S3). Three relational and three collective items, related to participants' self-definition (inter2 and inter3), agency (inter5 and inter6), and self-representations (inter11 and inter12), loaded on the first factor ($\alpha = 0.68$; $\alpha_{CH} = 0.67$, $\alpha_{FR} = 0.66$, $\alpha_{SP} = 0.64$, $\alpha_{UK} = 0.74$). A score of 'other-related' interdependencies was thus formed and was used as a mediating variable in the analyses. The four individual items loaded on the second factor, but the reliability was too low to form a score ($\alpha = 0.44$). Finally, two value items loaded on the last factor (along with a crossloading from the first factor), but the correlation was too low to form a score ($r = 0.29$). Thus, these six items were not used in the analyses.

Psychological distance of climate change was measured with 10 items that all ranged on a scale from 1 (completely disagree) to 6 (completely agree). Adapted from [41], and translated into the other languages, three items (ccdist1 to ccdist3) measured climate social psychological distance and three its hypothetical distance (ccdist4 to ccdist6). To control for a potential confounding factor of the perception of public discourses about COVID-19 with psychological distance (i.e., the higher the consensus, the shorter the psychological distance), four additional items (ccdist7 to ccdist10), created for the present study, measured participants' perceived consensus in the COVID-19 public discourses. The scales of some items were reversed, resulting in cases where a high score indicated perceptions of climate change as being close. Principal component analysis, with an oblimin rotation, revealed three factors with an eigenvalue superior to one (see Supplementary Material S3). The first factor comprised all items measuring social (ccdist1 to ccdist3) and hypothetical (ccdist4 to ccdist6) psychological distance ($\alpha = 0.78$; $\alpha_{CH} = 0.72$, $\alpha_{FR} = 0.83$, $\alpha_{SP} = 0.74$, $\alpha_{UK} = 0.80$). A score was created based on these six items and was used as a mediating variable in the analyses. The last four items, measuring perceived consensus in the public discourse, loaded on the last two factors. It was, however, not possible to create a score (all combinations of three items, $\alpha < 0.60$).

2.2.3. Dependent Variables

Participants' intentions to perform 12 PEB (both private and public [21]) commonly investigated in psychological research on climate change were measured, on a scale from 1 (not at all) to 6 (completely). In all cases, participants could state whether they were already engaged in the behaviour. Four PEB already performed by a sufficiently large share of the sample (at least 40% in each country; see Table 2) were recoded, such as 0 for 'does not perform the behaviour' and 1 for 'is already performing the behaviour'. The remaining PEB were treated as continuous variables, with a range from 1 to 6 (the score of the few participants already performing these behaviours was recoded as '6').

Latent classes analyses were then performed with Mplus 8. Several criteria are generally used to retain the number of latent profiles [38]. First, non-significant results for the Vuong–Lo–Mendell–Rubin (VLMR) and Lo–Mendell–Rubing (LRM) adjusted LRT tests indicate that a k class model adds nothing to a k-1 class model. Second, lower Akaike

Information Criterion (AIC) and Bayesian Information Criterion (BIC) values indicate a more appropriate number of classes, compared with a model with greater values. Finally, a higher entropy—the percentage of participants that are easily attributed to one class—indicates a clearer distinction between classes. Sometimes, the information provided by the different indices does not converge and decisions have to be taken. For instance, researchers should avoid profiles with a very low frequency [38].

Fit indices are provided in Table 3. We started with a four-class model. Both VLMR and the LMR-adjusted LRT test yielded significant estimates, which suggests that a four-class model fit the data better than a three-class model. Thus, we tested for a five-profile model, for which both tests were also significant. For this reason, a six-profile model was tested. In that case, both the VLMR and the LMR-adjusted LRT test were non-significant, which indicates that a six-class model adds nothing significant to a five-class model. The entropy was barely higher than in the five-class model. However, both the AIC and BIC decreased compared with the previous model. Despite that, we decided to retain the five-class model, as non-significant VLMR and LRM tests are known to be highly reliable indications of the true number of classes [42].

Table 3. Fits indices for latent class models.

N of Classes	VLMR	LRM	AIC	BIC	Entropy
4	<0.001	<0.001	31,928.22	32,215.74	0.85
5	0.027	0.028	31,743.23	32,094.09	0.84
6	0.201	0.204	29,133.05	29,542.40	0.85

The two most extreme classes consisted of a ‘strongly committed’ group (31.26%) and of a ‘strongly disengaged’ profile (12.22%). Participants in the ‘strongly committed’ profile had the highest frequency of self-reported PEB (see Figure 2) and the strongest pro-environmental intentions (see Figure 3). Conversely, ‘the strongly disengaged’ had the second lowest frequency of self-reported PEB, and by far the lowest intentions to engage in new PEB reported a very low PEB and average pro-environmental intentions (the second lowest mean in the sample). Next, the ‘disengaged’ profile (16.15%) reported the lowest level of PEB, but stronger intentions than the ‘strongly disengaged’.

Finally, two ‘moderately committed’ profiles were revealed, with more incongruent patterns of means. Indeed, in a profile that we named ‘committed to private PEB’ (18.53%), participants appeared to be quite engaged in PEB, and were willing to engage in new ones, but only in the private sphere. Finally, in the ‘the well-meaning’ (21.84%), rather infrequent self-reported behaviours (close to those of the ‘strongly disengaged’ were coupled with rather strong and homogeneous intentions (i.e., across both private and public PEB).

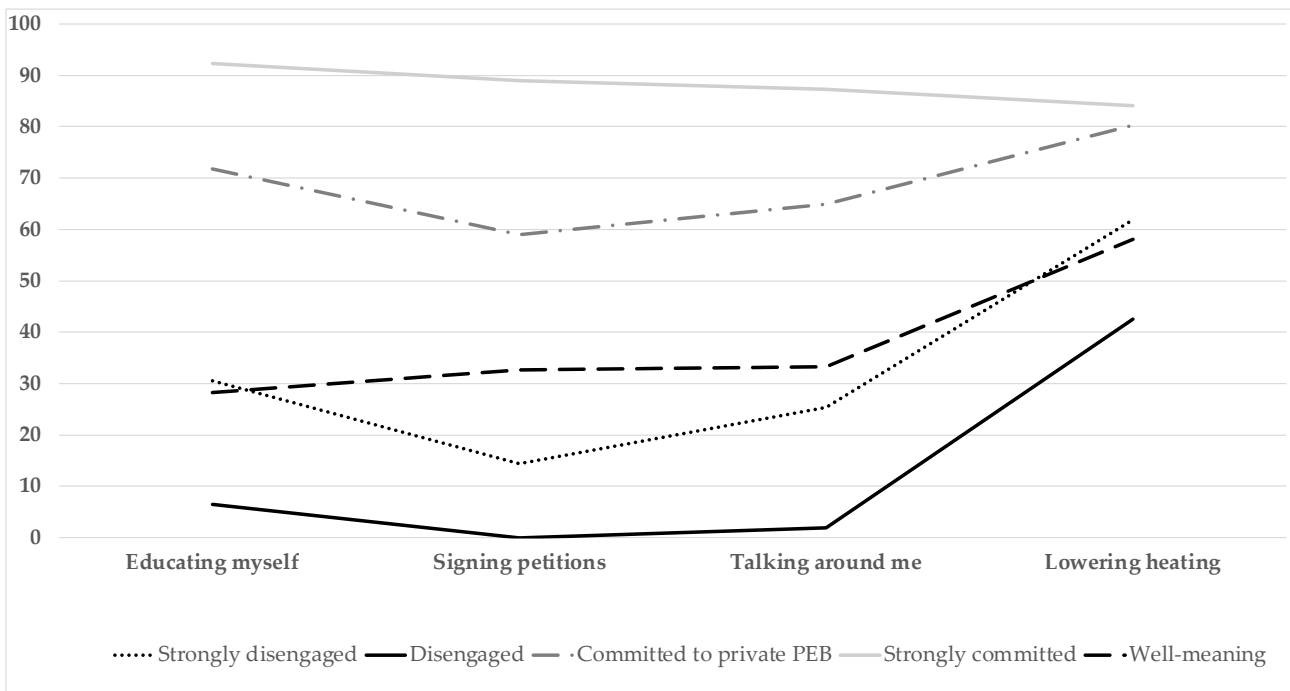


Figure 2. Proportion of participants who reported already being engaged in four different PEB, by profile.

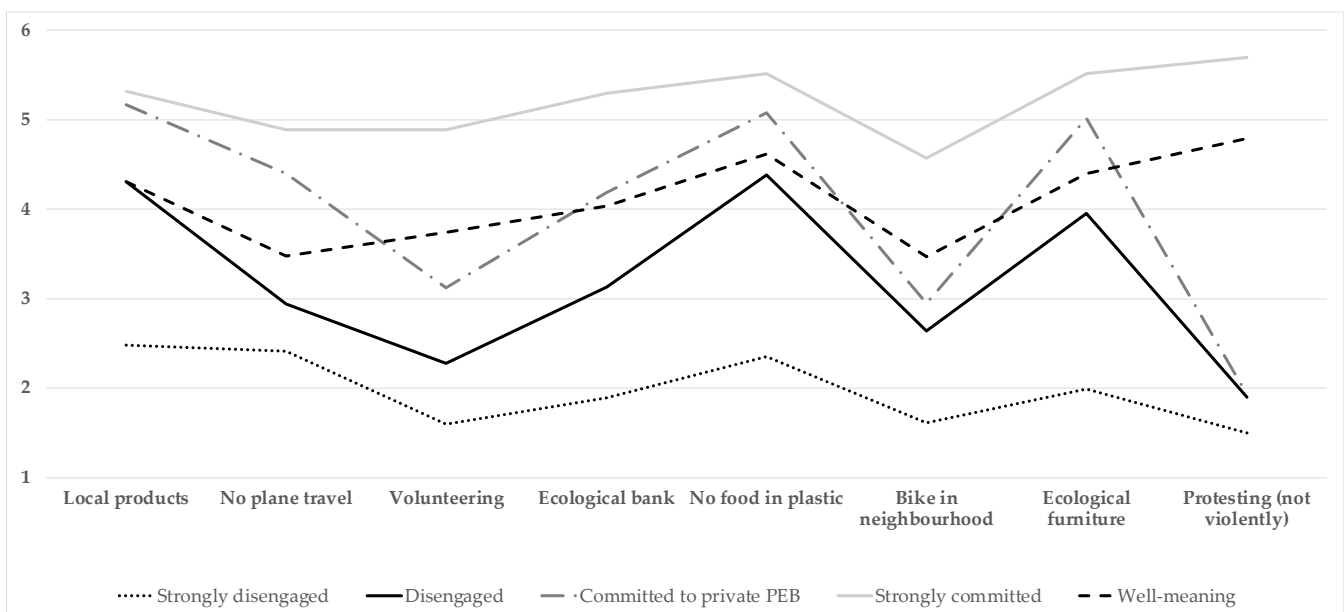


Figure 3. Intention to perform eight new PEB (scale from 1 to 6) by profile.

2.2.4. Psychological Control Variables

The present study was cross-sectional: we had no means to evaluate participants’ perceived interdependencies and psychological distance of climate change prior to the pandemic. For this reason and in addition to COVID-related control variables, we decided to account for several factors in the study that were likely to impact some or all our variables of interest:

- Human values are known to impact individuals’ tendency to cheat vs. follow rules [43,44], their tendency to worry for others [45], and the willingness to engage in PEB [25,26]. To

avoid a too long questionnaire, we focused on values that were particularly relevant in our case: conservation values (i.e., conformity to rules, personal security, and society's security), universalism people and nature, and benevolence. They were measured with 12 items adapted from Schwartz and colleagues' scale [46]. A component factor analysis, with oblimin rotation, showed that three factors obtained an eigenvalue superior to 1 (see Supplementary Material S3). First, the six conservation items (i.e., confr1, confr2, secp1, secp2, secs1, and secs2) were loaded on a first factor ($\alpha = 0.88$; $\alpha_{CH} = 0.88$, $\alpha_{FR} = 0.86$, $\alpha_{SP} = 0.89$, $\alpha_{UK} = 0.90$). Then, the four universalism items (related to people and nature together; i.e., unic1, unic2, unin1, and unin2) were loaded on the same factor ($\alpha = 0.82$; $\alpha_{CH} = 0.76$, $\alpha_{FR} = 0.85$, $\alpha_{SP} = 0.75$, $\alpha_{UK} = 0.85$). Finally, the two benevolence items (i.e., benc1 and benc2) were loaded on a separate and third factor ($r = 0.75$, $p < 0.001$; $r_{CH} = 0.71$, $r_{FR} = 0.78$, $r_{SP} = 0.72$, $r_{UK} = 0.78$).

- Individuals may have reported that they were engaged in anti-COVID measures to help others and/or in PEB because they knew that these behaviours are generally expected. For this reason, we also controlled for both general and environmental social desirability. Participants' general social desirability (i.e., desgen1 to desgen8) was measured with the eight items of the Self-deceptive Enhancement subscale from Bobbio and Manganeli [47]. The French version was adapted from D'Amour-Raymond [48], and the items were translated to Spanish for the present study. A principal component analysis (Supplementary Material S3) revealed only one factor with an eigenvalue superior to 1 ($\alpha = 0.78$; $\alpha_{CH} = 0.74$, $\alpha_{FR} = 0.81$, $\alpha_{SP} = 0.76$, $\alpha_{UK} = 0.82$). Environmental social desirability was measured with five items selected and translated (French and Spanish) from the Self-deception–assertion of positives subscale of Ewert and Galloway [49]. A principal component analysis, with an oblimin rotation (see Supplementary Material S3), revealed that one item was loaded on another factor (sdesenv5). Scale reliability ($\alpha = 0.61$) was indeed sufficient only when this item was not taken into account ($\alpha = 0.74$; $\alpha_{CH} = 0.74$, $\alpha_{FR} = 0.71$, $\alpha_{SP} = 0.79$, $\alpha_{UK} = 0.70$).
- To partially account for the potential impact of individuals' perception of the COVID-19 crisis on their perceptions of climate change, we asked participants to estimate whether they felt less or more worried about the latter because of the former, on a scale from 1 (much less worried) to 6 (much more worried).

Finally, we also controlled for three COVID-related factors. First, COVID-related psychological distance was measured with the same 10 items as previously, but for the mention of COVID-19 instead of climate change. A principal component analysis, with oblimin rotation, revealed three factors with an eigenvalue superior to 1 that did not match the three theoretical dimensions (i.e., social, hypothetical, and perceived consensus; see Supplementary Material S3). Three items related to participants perceived psychological distance between themselves (or their close ones) and the pandemic (covdist1, covdist2, and covdist6) were loaded together on the first factor ($\alpha = 0.74$; $\alpha_{CH} = 0.67$, $\alpha_{FR} = 0.78$, $\alpha_{SP} = 0.73$, $\alpha_{UK} = 0.78$). Then, three 'perceived convergence' distance items loaded on the second factor (covdist8 to covdist10), but the scale reliability was quite low ($\alpha = 0.43$) and could not be improved by removing an item. Finally, the correlation of the two hypothetical distance items that were loaded on the last factor (covdis4 and covdist5) was too low to form a score, $r = 0.25$, $p < 0.001$. To map participants' perceived distance between COVID-19 and themselves or the world, we decided to use a three-item score to estimate the former, and one item (covdist4) to map the latter. Second, respondents were asked whether they had experienced COVID symptoms. A small portion of them had (12.88%), from 10.74% in France to 17.16% in Spain. Third, they were also asked to estimate how many people they knew (friends and family) had symptoms. About a half of them (49.59%) knew at least one person who had had symptoms. Finally, participants' worry regarding the COVID-19 crisis was measured with two items (perc4 and perc6; $r = 0.54$, $p < 0.001$; $r_{CH} = 0.53$, $r_{FR} = 0.66$, $r_{SP} = 0.43$, $r_{UK} = 0.52$). All COVID-related items were created and translated for the present study.

3. Results

Path models were performed with Mplus 8 to test our hypotheses. The probability to belong to the five profiles were used as dependent variables in separate models. In addition to the variables described in Section 2.2.4. Psychological control variables, the analyses were also controlled for socio-demographic information (i.e., age, being male, and the national context), the housing situation (having an outdoor access vs. not), and personal reasons for complying with anti-COVID measures.

First, we report whether prosocial reasons to comply with anti-COVID measures (IV) were related to the mediating variables, i.e., perceived interdependencies and psychological distance of climate change (note that the coefficients were identical across the path models predicting each dependent variable). The control variables that were significantly related to the two mediating processes will also be reported (all results, including the non-significant coefficients, are provided in Supplementary Material S4). Second, we report how the two mediating processes related to the five profiles (DVs). Finally, in a last section, we report indirect paths from the IV to the DVs. The main results are summarized in Figure 4.

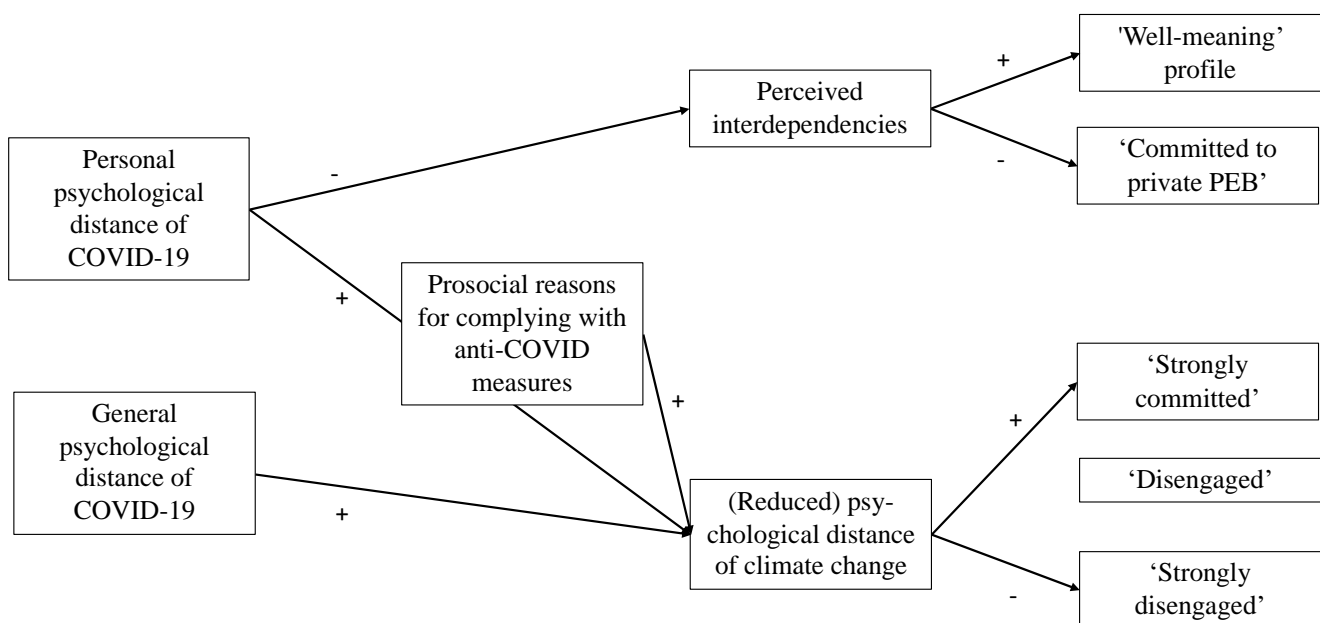


Figure 4. Summary of significant relationships between variables of interest.

3.1. Mediating Variables

Contrary to our expectation (H1), prosocial reasons for complying with anti-COVID measures were not related to perceived interdependencies ($\beta = 0.06, p = 0.15, 95\% \text{ CI } [-0.02, 0.15]$). By way of contrast, the more participants perceived COVID-19 as personally psychologically close, the less they reported perceived interdependencies between their self and 'others' (personal COVID-19 PD: $\beta = -0.11, p < 0.001, 95\% \text{ CI } [-0.18, -0.05]$). Other control variables were significantly related to perceived interdependencies: being male ($\beta = 0.07, p = 0.02, 95\% \text{ CI } [0.01, 0.13]$), having outdoor access ($\beta = 0.06, p = 0.04, 95\% \text{ CI } [0.00, 0.12]$), the national context (CH vs. FR, $\beta = -0.14, p < 0.001, 95\% \text{ CI } [-0.22, -0.07]$; CH vs. SP: $\beta = -0.11, p = 0.002, 95\% \text{ CI } [-0.18, -0.04]$), not having had COVID-19 symptoms ($\beta = -0.07, p = 0.03, 95\% \text{ CI } [-0.13, -0.01]$), knowing people who had symptoms ($\beta = 0.07, p = 0.03, 95\% \text{ CI } [0.01, 0.13]$), COVID-19 worry ($\beta = 0.25, p < 0.001, 95\% \text{ CI } [0.19, 0.32]$), and benevolence values ($\beta = 0.21, p < 0.001, 95\% \text{ CI } [0.14, 0.27]$).

In line with our expectation (H3), the more reported participants engaged in anti-COVID measures for prosocial reasons, the more they reported climate change as psychologically close ($\beta = 0.15, p < 0.001, 95\% \text{ CI } [0.08, 0.22]$). Significant relationships were also found between the psychological distance of climate change and the psychological distance of COVID-19,

both personal ($\beta = 0.16, p < 0.001, 95\% \text{ CI } [0.10, 0.21]$) and general ($\beta = 0.10, p < 0.001, 95\% \text{ CI } [0.05, 0.16]$). Other control variables were significantly related to perceptions of climate change perceived as close: conservation ($\beta = -0.09, p = 0.005, 95\% \text{ CI } [-0.16, -0.03]$), universalism ($\beta = 0.34, p < 0.001, 95\% \text{ CI } [0.28, 0.40]$), and benevolence ($\beta = -0.06, p = 0.04, 95\% \text{ CI } [-0.12, -0.00]$) values, a low general social desirability ($\beta = -0.16, p < 0.001, 95\% \text{ CI } [-0.22, -0.10]$), a strong environmental social desirability ($\beta = 0.07, p = 0.01, 95\% \text{ CI } [0.02, 0.13]$), and reporting more climate worry since the COVID-19 crisis ($\beta = 0.33, p < 0.001, 95\% \text{ CI } [0.28, 0.39]$).

3.2. Predicting Membership to the Five Profiles

Contrasted patterns were found across the five profiles. First, the two most extreme (and congruent) profiles were characterized by rather similar results. Indeed, in both cases, perceived interdependencies were not significantly related to the probability to belong to the profile ('the strongly committed': $\beta = 0.01, p = 0.78, 95\% \text{ CI } [-0.05, 0.07]$, 'the strongly disengaged': $\beta = -0.03, p = 0.30, 95\% \text{ CI } [-0.10, 0.03]$). In these two cases, H2 was thus not confirmed. In contrast, the psychological distance of climate change was significantly related to both profiles ('the strongly committed': $\beta = 0.21, p < 0.001, 95\% \text{ CI } [0.14, 0.29]$; 'the strongly disengaged': $\beta = -0.28, p < 0.001, 95\% \text{ CI } [-0.35, -0.21]$). The more participants perceived climate change as close, the more likely they belonged to 'strongly committed', and the less likely they belonged to 'strongly disengaged'. In these two cases, H4 was confirmed. In contrast, the 'disengaged' profile was related neither to perceived interdependencies ($\beta = 0.02, p = 0.64, 95\% \text{ CI } [-0.05, 0.08]$) nor to psychological distance of climate change ($\beta = -0.07, p = 0.10, 95\% \text{ CI } [-0.14, 0.01]$).

A reverse pattern was found in the case of the two incongruent patterns. Indeed, perceived interdependencies were significantly related to the probability to belong to both the 'well-meaning' and the 'committed to private PEB' profiles. In the first, the relationship was positive: the more participants perceived interdependencies between their self and others, the greater the probability they belonged to the 'well-meaning' profile ($\beta = 0.10, p = 0.005, 95\% \text{ CI } [0.03, 0.17]$). The relationship was negative when it came to the 'committed to private PEB' profile ($\beta = -0.10, p = 0.005, 95\% \text{ CI } [-0.17, -0.03]$). In both cases, psychological distance of climate change was not related to the profiles (the 'well-meaning': $\beta = 0.00, p = 0.94, 95\% \text{ CI } [-0.08, 0.09]$; the 'committed to private PEB': $\beta = 0.04, p = 0.37, 95\% \text{ CI } [-0.04, 0.12]$).

Some control variables were significantly related to some of the five profiles, as summarized in Table 4. Human values appeared to have some consistent impacts: lower conservation and strong universalism values predicted membership to the 'strongly committed' and the 'well-meaning' profiles, while the reverse pattern (high conservation and low universalism) were related to the 'strongly disengaged' and the 'disengaged' profiles. A high general social desirability was related to a lower probability of being 'strongly committed', while the reverse relationship was found in the case of participants' score of environmental social desirability. In contrast, a low environmental social desirability was related to a stronger probability to belong to the 'well-meaning' profile. Perceptions of the COVID-19 crisis as increasing climate change worry were positively related to membership to the 'strongly committed' profile, while the opposite relationship was found with the two disengaged profiles. Finally, it should be noted that the probability to belong to the 'committed to private PEB' profiles was not significantly related to any psychological control variables.

Table 4. Summary of positive and negative significant relationships between the control variables and the probability to belong to the five profiles (the detailed coefficients can be found in Supplementary Material S3).

	Strongly Committed	Disengaged	Strongly Disengaged	Well-Meaning	Committed to Private PEB
Male					
Age		+			
National context (CH)			+	-	
FR			+		-
SP			+		-
UK		-			
Access to outdoor					
Personal reasons					
PD: COVID-19					
Personal					
General					
Symptoms (% yes)					
Personal	+				
People they knew					
COVID-19 worry					
Human values					
Universalism	+	-	-	+	
Benevolence					
Conservation	-	+	+		
Social desirability					
General	-				
Environmental	+			-	
Self-rated impact of COVID-19 crisis on concern for climate change	+	-	-		

3.3. Indirect Paths

Prosocial reasons to comply with anti-COVID measures were indirectly and positively related to the ‘strongly committed’ profile ($\beta = 0.03$, $p = 0.001$, 95% CI [0.01, 0.05]), and negatively to the ‘strongly disengaged’ profile ($\beta = -0.04$, $p < 0.001$, 95% CI [-0.07, -0.02]), through the psychological distance of climate change. In other words, the more participants complied with anti-COVID measures for prosocial reasons, the more they perceived climate change as psychologically close, and the greater the probability to belong to the ‘strongly committed’ profile, the lesser the probability to belong to the ‘strongly disengaged’ profile. Prosocial reasons to comply with anti-COVID measures were, however, not indirectly related to the ‘well-meaning’ and the ‘committed to private PEB’ profiles, as they did not relate significantly to perceived interdependencies. Other significant indirect links were revealed:

- Personal reasons to comply with anti-COVID measures were negatively related to the ‘strongly committed’ profile ($\beta = -0.02$, $p = 0.04$, 95% CI [-0.04, -0.00]), and positively related to the ‘strongly disengaged’ profile ($\beta = 0.02$, $p = 0.03$, 95% CI [0.00, 0.05]), through the psychological distance of climate change.
- A reduced personal psychological distance of COVID was positively related to the ‘strongly committed’ profile ($\beta = 0.03$, $p < 0.001$, 95% CI [0.02, 0.05]), and negatively to the ‘strongly disengaged’ profile ($\beta = -0.04$, $p < 0.001$, 95% CI [-0.06, -0.03]), through the psychological distance of climate change. It was also negatively related to the ‘well-meaning’ ($\beta = -0.01$, $p = 0.03$, 95% CI [-0.02, -0.00]), and positively to the ‘committed to private PEB’ profile ($\beta = 0.01$, $p = 0.03$, 95% CI [0.00, 0.02]), through perceived interdependencies between the self and others.
- Finally, a reduced general psychological distance of COVID-19 was positively related to the ‘strongly committed’ profile ($\beta = 0.02$, $p = 0.002$, 95% CI [0.01, 0.04]), and negatively to the ‘strongly disengaged’ profile ($\beta = -0.03$, $p = 0.001$, 95% CI [-0.05, -0.01]), through a reduced psychological distance of climate change.

4. Discussion

Data from an online study conducted in four countries when Europe was deconfining late Spring 2020 revealed five different ‘environmental’ profiles. How these profiles related to prosocial reasons for complying with anti-COVID measures, and whether these relationships were mediated by both perceived interdependencies and the psychological distance of climate change, was examined using path models. Different patterns of results were found, as a function of the environmental profile under consideration. First, the probability to belong to the two most congruent profiles (the ‘strongly committed’ and the ‘strongly disengaged’) were indirectly related to prosocial reasons for complying with anti-COVID measures. Those individuals that complied with anti-COVID measures for prosocial reasons were also those who tended to see climate change as psychologically close, leading them to belong to the strongly committed profile. Conversely, those who complied with anti-COVID measures for personal reasons tended to perceive climate change as more distant and thus belonged to the strongly disengaged profile. Perceived interdependencies played no role in predicting the probability to belong to the congruent profiles.

By way of contrast, the probability to belong to two more ‘incongruent’ profiles (the ‘well-meaning’ and the ‘committed to private PEB’) were not related to prosocial reasons for complying with anti-COVID measures, neither directly nor indirectly. Other psychological processes seemed at play in these cases: a reduced psychological distance between COVID and the self was related to heightened perceived interdependencies between the self and others, which, in a turn, were related to these two profiles. The fifth profile (the ‘disengaged’) did not appear to relate significantly to the constructs of interest. In the following, we discuss how the results of the present study informs on (a) the relevance of relying on a latent profile approach when predicting PEB, (b) the fact that measures of psychological distance can vary according to the object in question, and (c) how perceived interdependencies is a promising concept to understand how humans react to global and pressing crises such as climate change or pandemics.

4.1. Congruent vs. Incongruent Environmental Profiles

Although relying on a latent profile approach has been increasingly used in research on PEB [38], the great majority of studies in this field still rely on a variable-centred approach (for meta-analyses, see, for instance, [50,51]). The underlying assumption to such an approach is that individuals vary on a continuum, from ‘not sustainable’ to ‘sustainable’. It has, however, been firmly established that there are ‘green’ gaps, either between pro-environmental attitudes and behaviours, or between pro-environmental intentions and behaviours [52]. The results of the present study highlight to what extent it is crucial to investigate different types of environmental profiles, as the underlying mechanisms related to the probability to belong to them varied greatly, apparently as a function of how congruent vs. incongruent the profiles were.

The two most congruent profiles (i.e., the strongly committed: strong intentions coupled with frequent PEB, and the strongly disengaged: low intentions coupled with infrequent PEB) were related to well-established antecedents of PEB such as the psychological distance of climate change [29–32], and conservation and universalism values [25]. The indirect relationships between prosocial reasons for complying with anti-COVID measures further suggest that communal motives (or the lack of) are at the core of these two profiles. That is, participants seemed to engage in both anti-COVID measures and behaviours that contribute to mitigating climate change primarily for others. More unusual patterns of results emerged when it came to the three other profiles. Two of them (the ‘well-meaning’ and the ‘committed to private PEB’ profiles) were significantly related to high vs. low perceived interdependencies between the self and others, and not the psychological distance of climate change. This may be partly explained by the measure of perceived interdependencies we used (see Section 4.3).

4.2. *The Psychological Distance of the Two Crises*

First of all, despite using highly similar items, the factorial structure found for the scales we used to estimate participants' psychological distance of climate change and the COVID-19 pandemic differed greatly. In the case of climate change, a clear dimension that encompassed social and hypothetical aspects was revealed, while a less clear-cut pattern emerged in the case of the pandemic. There may be several explanations for these differences. Firstly, our data collection period occurred fairly early in the pandemic. Despite the rapid adoption of lockdown or mitigative measures, the majority of our sample was not directly confronted with the disease (at least for themselves) at the time. Perceptions of social and hypothetical distance may thus have varied over the following months. Secondly, other studies have shown that confrontation with the pandemic did not necessarily reduce the perception of uncertainty associated with climate change (e.g., [53]). Uncertainty being strongly linked to the concept of hypothetical distance may indicate a difference in perceived nature between the two crises going beyond psychological distance, despite their common threatening and global character.

Because of these differences in structure, we were not able to compare the psychological distance of both crises. What we could do, however, was to estimate the relationships between the constructs: both measures of the psychological distance of COVID-19 (personal and general) were significantly and positively related to the measures of the psychological distance of climate change. This result is in line with the results obtained by Geiger and colleagues [5] in the US in 2020: doubting the severity of the pandemic was positively related to doubting climate change, 'suggesting the possibility that mistrust might reflect a deeper worldview' (p. 13). The psychological distance of both climate change (directly) and the pandemic (indirectly) were related to a greater engagement in mitigating climate change, reflecting the bonds between trust and actions to help others [9].

4.3. *Perceived Interdependences between the Self and Others*

Based on the theoretical framework developed by Brewer and Chen [18], we expected two 'other-related' dimensions of the self to emerge: one related to close ones (relational self), and another related to more collective entities (collective self). However, the factor analysis performed on the data did not allow for distinguishing the two. The resulting 'other-related' self-construal was found to relate significantly to benevolence values (when one cares for close ones) and not to universalist values (when one cares for others in general, not necessarily people one knows). This could hint to the fact the construal was closer to the 'relational self'. In the same way, our measure of 'other-related' self was significantly related to reporting that close ones had COVID-19 symptoms. Thus, in the first months of the pandemic, when not much was known about the virus and many feared for the health of their loved ones (whom they could not visit or help directly), the boundaries between distant and close social groups may have been blurred. This may explain the lack of significant relationship between our measure of 'other-related' self-construals and the two congruent environmental profiles, related to universalist but not to benevolence values.

Why such an other-related self-construal is related to the two incongruent profiles is rather puzzling. When it comes to the 'well-meaning' profile, one can argue that feeling connected with the people around oneself may lead to be particularly sensitive to normative expectations, one of the strongest predictors of PEB [54]. When it comes to the willingness to commit to private PEB (and not to engaged in public ones), its negative relationship with perceived interdependencies may exist because it allows for maximum control over one's image of the self. Therefore, the lower one's construal of themselves as linked to others is, the higher their commitment to their private and individual PEB is. As explained in the next section, a measure of interdependencies more closely conceptually related to climate change may have brought different results.

4.4. Limitations of the Present Study

The main limit of the present study is its correlational nature. However, due to the unexpected and rapid nature of the pandemic in the early months of 2020, we were not able to collect data before anti-COVID measures were implemented. For this reason, we included a large array of control variables, and some of them produced interesting results. For instance, a low general social desirability was related to a reduced psychological distance of climate change while a positive relationship was found in the case of the measure of environmental social desirability, which highlights the need to use social desirability scales directly that are related to the topic of interest. The differential impact of the three types of human values we considered—conservation, universalism, and benevolence—also helped us to shed light on some intriguing results, as explained above.

Another limitation of our study is the measure of perceived interdependencies we used. Future research on the topic should consider interdependencies that are more closely related to climate change, that is, those resulting from intergenerational, global, and ecological injustices [22]. First, the youth of today and of tomorrow are inheriting of a highly polluted planet and will thus have to live on a much lower ‘carbon budget’ than their parents and grandparents. Second, some parts of the whole contribute a lot to climate change, while not suffering much (at least not yet) from its consequences. The extent to which nations contribute to and suffer from climate change differs indeed greatly. Thus, an acute sense of solidarity with countries or continents that suffer most of environmental issues—or, in other words, beliefs of global environmental justice—is likely to predict PEB. Third, finally, human activity has deep consequences on the living conditions (and in many cases, extinction) of other species, which will, in turn, affect human life.

5. Conclusions

The COVID-19 pandemic and climate change are both major global crises that threaten social equilibrium. In a study carried out in four European countries, we showed that ‘prosocial’ reasons to comply with anti-COVID measures were associated with congruent profiles of pro-environmental behaviour through a modified perception of psychological distance. These results suggest the existence of psychological and social factors common to both crises, which can be clarified in futures studies.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su151713194/s1>. S1: questionnaire (UK version). S2: Means and standard deviations (or frequencies, when relevant) of all items (but socio-demographics), in general and by country. S3: Results of all principal component analyses mentioned in the Materials and Methods section. S4: Results of path models.

Author Contributions: Conceptualization and methodology: O.S., C.Z., O.R., R.A.T.A. and A.G.; formal analysis, O.S.; data curation, C.Z. and O.R.; writing—original draft preparation, O.S.; writing—review and editing, C.Z., O.R., R.A.T.A. and A.G.; visualization, O.S. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and was approved by the Ethics Committee of the Faculty of social and political sciences, University of Lausanne, in May 2020 (ethical request #C_SSP_042020_00004).

Informed Consent Statement: At the beginning of the questionnaire, participants were told that by giving answers, they consented that their data would be used for research purposes only.

Data Availability Statement: The data presented in this study are openly available in the FORS replication service (a link to Swissbase is provided there). <https://doi.org/10.25597/586g-0k84>.

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