Fairness in Climate Cost Allocation: Exploring Public Support and Implications for Policy Design

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Abstract

Climate cost allocation is a recent and essential topic in climate change debates. Considering public support in decision-making for policies regarding cost allocation will enhance public support, and by extension policy adherence. This research focuses on the underlying mechanisms behind public policy support for climate cost allocation, aiming to answer the question: How do perceived consequences and perceived responsibility relate to public policy support of climate cost allocation? Two fairness principles proposed by Kanne and Theelen (2022) were considered. A survey was used to gather the data for the independent variables perceived consequences (PC) and perceived responsibility, and the dependent variable policy support. The results show that more negative PC is related to the lower support of both principles. Furthermore, higher perceived responsibility relates to higher support for both principles. Therefore, the more someone feels they should do something to help the climate, the more likely they are to accept climate cost allocation policies, regardless of the underlying principle. Lastly, there was no evidence of an interaction effect between PC and perceived responsibility. Further research could establish whether there exists a causal link between the variables in this model. Policymakers could use these findings for strategies enhancing public policy support. Strategies might include reframing policies to emphasize personal benefits or enhancing perceived responsibility. However, reframing policies to emphasize personal benefits should be avoided in populations with high perceived responsibility.

Keywords: Public support, Climate cost allocation, Perceived consequences, Perceived responsibility, Fairness principles

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Climate change has had a disastrous impact all over the world. We need mitigation and adaptation methods and we need to repair the damage that has already been done. However, such big changes need a lot of financial investment. Right now, the Dutch government is focusing on how to allocate these climate change costs (De Vries et al., 2023). Whether it means paying a tax or receiving a subsidy for installing solar panels, individuals will experience the consequences of climate policies. Therefore, public support is essential (Gampfer, 2014). In the end, we have to pay for the mitigation and adaptation methods. We must find out the fairest way to allocate the costs. Additionally, we need to understand public opinions on fairness and what factors influence this judgment.

Public policy support matters because of several reasons. As stated, Gampfer (2014) emphasizes climate agreements influence individuals directly. Therefore, their opinion and support matter. More importantly, public policy support already influences policies and policy adherence directly. For example, the expected lack of policy support might make policymakers hesitant to implement policies (Drews & Van Den Bergh, 2015). Thus, the public influences which policies are implemented. This is especially relevant in democratic countries. Thirdly, perceptions of a fair allocation enhance policy support (Bergquist et al., 2022; Bovens et al., 2023; Okereke, 2017). The perceived fairness of a policy influences whether individuals want to pay for climate mitigation (Anderson, Bernauer, & Balietti, 2017). Lastly, even though taking fairness into account during the process, De Vries et al. (2023) expect the process will take less time since it reduces resistance.

Even though the phenomenon of climate policy support finds great attention in the current research body (e.g. Bergquist et al., 2022), to my knowledge, there is no evidence explaining why the public supports specific climate cost allocation policies more than others.

For example, as research by Kanne and Theelen (2022) has found, people disagree mostly with the idea that everyone pays the same amount (e.g. carbon tax). However, they do not state why this is the case. Two mechanisms that could explain the variance in public support for climate cost allocation policies are the perceived consequences (PC) and the perceived responsibility. PC are considered since policies with high personal costs attract less public support (Dan et al., 2007; Drews & Van Den Bergh, 2015). Perceived responsibility could be an important factor since a meta-analysis has shown that perceived responsibility is especially strong for pro-environmental policy support (Markowitz & Syropoulos, 2022). Therefore, this thesis aims to study how PC and perceived responsibility relate to public policy support of climate cost allocation. In addition, how policies are constructed can vary. These differences will be taken into account as well.

Cost Allocation Principles and Policy Support

Policies can be based on several ways of allocation. This thesis will examine two approaches: contribution and profit and individual rights and freedoms. The first way to allocate costs is based on contribution and profit (Kanne and Theelen, 2022). Contribution and profit aims to promote sustainability by rewarding sustainable behavior and correcting unsustainable behavior. This implies that the costs of climate change are paid by those who pollute more than others. At the same time, those who already act sustainably are rewarded. For example, currently, subsidies are provided for those wanting to make their house more sustainable in the Netherlands (Bovens et al., 2023). Additionally, profits are considered in two ways. Firstly, those profiting from climate adaptations or mitigations would pay for these measures. An example could be that those who would benefit from an embankment, because they live in a high-risk area for flooding, should be the ones to pay for the construction. Secondly, profits made by acting unsustainable in the past are considered. However, this is hard to translate into a specific policy since it is almost impossible to determine how much

and who profited from these practices (Bovens et al., 2023). The report by Bovens et al., (2023) mentions policies based on the principle of contribution and profit as the least supported by the public, apart from individual rights and freedoms. Czajkowski et al. (2017) found that willingness to pay for climate mitigation policies in the UK and Czech Republic depends on cost distribution. Willingness to pay was higher when costs were allocated based on a contribution and profit principle. Furthermore, Hammar and Jagers (2007) found participants preferred a CO2-tax allocation based on a contribution and profit principle compared to an approach where costs are distributed equally to everyone. This effect was strongest for those who did not drive a car frequently and therefore were not affected as much by the policy.

Another way to allocate costs is based on the principle of individual rights and freedoms (Kanne & Theelen, 2022). This principle means that everyone is in an equal position, with the same degree of freedom, however, every individual is responsible for dealing with consequences of climate change (Bovens et al., 2023). Following this principle, no one tells you how to adapt to climate change. However, if you, e.g., have a flooded garden, you pay for the repairs yourself. This was for example put into practice in the Netherlands after the extreme rains and floods in Limburg in 2021. All inhabitants were expected to be properly insured and able to pay for repairs themselves (Bovens et al., 2023). Another manifestation of this principle is an equal carbon tax, where everyone has to pay the same amount of tax to compensate for the CO2 emission regardless of how much they pollute. Policies based on the principle of individual rights and freedoms are the least supported by the public compared to the three other principles (Bovens et al., 2023). However, Hammar and Jagers (2007) found participants prefer an individual rights and freedoms approach when deciding upon a CO2 -tax only when they used a car frequently (Hammar & Jagers, 2007). Interestingly, even though the government implemented an individual rights and freedoms

approach in the flooding example mentioned above, participants do not support this approach in the extreme weather example in the research by Kanne and Theelen (2022).

Kanne and Theelen (2022) propose two more principles, however, including them would go beyond the scope of this thesis. I chose to use these two principles since they are contrasting principles that show who has a responsibility to pay. Appendix A includes a summary of the principles.

Perceived Consequences and Policy Support

One way to explain differences in policy support could be differences in the perceived consequences of policies. This means individuals might be less likely to support policies with negative personal consequences. Because individuals wish to avoid negative personal consequences, adding negative consequences to unwanted behavior is a common strategy to discourage the behavior (Bolderdijk et al., 2012). However, some climate policies have natural negative consequences, like high monetary costs or having to change behavior. Past research shows that climate policies with high personal costs attract less public support (Dan et al., 2007; Drews & Van Den Bergh, 2015). Research by Geiger et al. (2021) reinforces this since they found climate policies will be less supported when individuals have to pay for them, compared to when others pay for them. Czajkowski et al. (2017) found people from the UK and the Czech Republic preferred a cost allocation based on contribution and profit, however, half of the participants from Poland were against such an allocation. Czajkowski et al. (2017) hypothesize this is because of Poland's dependence on coal and high emissions. Therefore, a contribution and profit approach would result in high costs and is less attractive. This example shows differences in consequences can predict differences in support for the same policy. Furthermore, research by Bechtel and Scheve (2013) suggests that, for households in Switzerland, increasing costs for mitigation from 1 to 2 % of GDP, decreases policy support by approximately 20 %. Lastly, as mentioned, Hammar and Jagers (2007)

found that participants preferred a contribution and profit approach to a CO^2- tax, especially if participants were not negatively affected by the policy (i.e., they did not drive a car frequently). Therefore I expect that the more negative the PC, the lower the support for policies based on either principle. Following this, the first hypothesis is:

Hypothesis 1: Perceived consequences of policies will influence the support for allocation principles.

H1a. The more negative the PC of individual rights and freedoms, the lower the support for individual rights and freedoms.

H1b. The more negative the PC of contribution and profit, the lower the support for contribution and profit.

Perceived Responsibility and Policy Support

Another factor influencing policy support could be perceived responsibility. Based on research by Markowitz and Syropoulos (2022), I define perceived responsibility as an individual responsibility to address climate change. This refers to the notion that someone feels they should or want to help counteract climate change. This notably differs from historical responsibility, which focuses on who caused climate change. Perceived responsibility corresponds with the factor of *personal norms* in the Norm Activation Model by Schwartz (1977), which is referred to as 'a moral commitment to do, or not to do, certain actions that lead to pro-environmental behavior' (Cotton et al., 2023, p. 2). The Norm Activation Model is often used to gain insight into pro-environmental behavior. Personal norms are the strongest predictor for behavioral intention, and increase intentions for pro-environmental behavior (Cotton et al., 2023; Steg & Van Der Werff, 2015). Furthermore, a meta-analysis of research in twenty-three countries has shown that perceived responsibility is positively associated with pro-environmental attitudes and behaviors, and is especially strong for pro-environmental policy support (Markowitz & Syropoulos, 2022). However, the effect

of perceived responsibility on policy support might differ per principle. Firstly, I expect higher perceived responsibility is related to higher public support of policies based on the contribution and profit principle. I expect this because those with a higher perceived responsibility believe they should or want to help counteract climate change. Previous research has found that perceived responsibility is positively related to support for policies that fit the principle of contribution and profit, including carbon taxes on fossil fuel companies and subsidies for renewable industries (Markowitz and Syropoulos, 2022; Seiler & Stalker, 2023). Secondly, to determine the effect of perceived responsibility on support for policies based on an individual rights and freedoms approach, we need to look at individualism. The principle of individual rights and freedoms fits the individualistic ideology since individual autonomy is a fundamental part of both (Calder et al., 2022; Kanne & Theelen, 2022). Key characteristics of individualistic people are that they find the needs of the individual are more important than the needs of society (Hofstede, 1984). Therefore, wanting to help counteract climate change, a societal problem, is less likely when individualism is high. Further, individualistic people support climate policies involving a lot of government interference less than other policies (Leiserowitz, 2006; Smith & Leiserowitz, 2013). Therefore, policies based on an individual rights and freedoms approach do not involve much government interference, everyone is free to act how they want. On the other hand, policies based on a contribution and profit approach, are designed to make unsustainable acts less attractive and sustainable acts more attractive and thereby aim to influence the behavior of individuals. They, therefore, involve a lot of government interference. Since perceived responsibility relates to high support of policies based on contribution and profit, and this opposes the principle of individual rights and freedoms in terms of individualism and government interference, I expect an opposite effect for the principle of individual rights and

freedoms. Thus, I expect higher perceived responsibility is related to lower support for policies based on the individual rights and freedoms principle.

Hypothesis 2: Perceived responsibility will influence people's support for allocation principles.

H2a. The higher the perceived responsibility of the individual, the lower the support for individual rights and freedoms

H2a. The higher the perceived responsibility of the individual, the higher the support for contribution and profit

Interaction Effect between PC and Perceived Responsibility

The potential interaction between the PC of the policy and perceived responsibility has not directly been examined yet. However, I assume these factors could be related because, when costs are high, past evidence shows that personal values are stronger predictors for sustainable behavior, compared to when costs are low (Guagnano et al., 1995). Furthermore, people with high perceived responsibility are willing to support pro-environmental policies, even when there are negative personal consequences (e.g. Anderson, Bernauer, & Balietti, 2017). This might suggest a relationship between the variables PC and perceived responsibility, since those with higher perceived responsibility are willing to take on more costs to help the environment. On the other hand, it might suggest the variables are not related, since an increase in costs does not mean people with higher perceived responsibility support policies less. Testing whether there is an interaction between the variables gives a more complete view of the relationship between PC, perceived responsibility, and policy support. The expectations for the interaction effects follow directly from the first and second hypotheses. Thus, I expect the combination of the expected effects mentioned in the first and second hypotheses to create certain situations where policy support is most or least likely. For the principle of individual rights and freedoms, more positive PC and lower perceived

responsibility are expected to relate to higher support (H1a. and H2a.). Therefore, when PC are more positive and perceived responsibility is lower, I expect the public support of policies to be the highest. Evidence suggests that negative personal PC decreases perceived responsibility when individualism is high, which supports this expectation (Hofstede, 1984). However, for the principle of contribution and profit, more positive PC and higher perceived responsibility are expected to relate to higher support of policies (H1b. and H2b.). Therefore, when PC are more positive and perceived responsibility is higher, I expect the support of policies to be the highest.

Hypothesis 3: perceived responsibility will influence the relationship between PC and support.

H3a. More positive PC and higher perceived responsibility will lead to the highest support for the principle of contribution and profit.

H3b. More positive PC and a lower perceived responsibility will lead to the highest support for the principle of individual rights and freedoms.

Current Research

To conclude, public support needs to be an explicit part of the policy-making process. This thesis will examine how PC and perceived responsibility relate to public support of the allocation principles, namely contribution and profit and individual rights and freedoms. No research has examined why the public support certain policies over others and what factors influence this process. The results might give more insight into applying the new allocation principles and enhancing climate policy support in the Netherlands. This study aims to answer the following question: How do PC and perceived responsibility relate to public policy support of climate cost allocation? Figure 1 summarizes the research model.

Figure 1

Research model
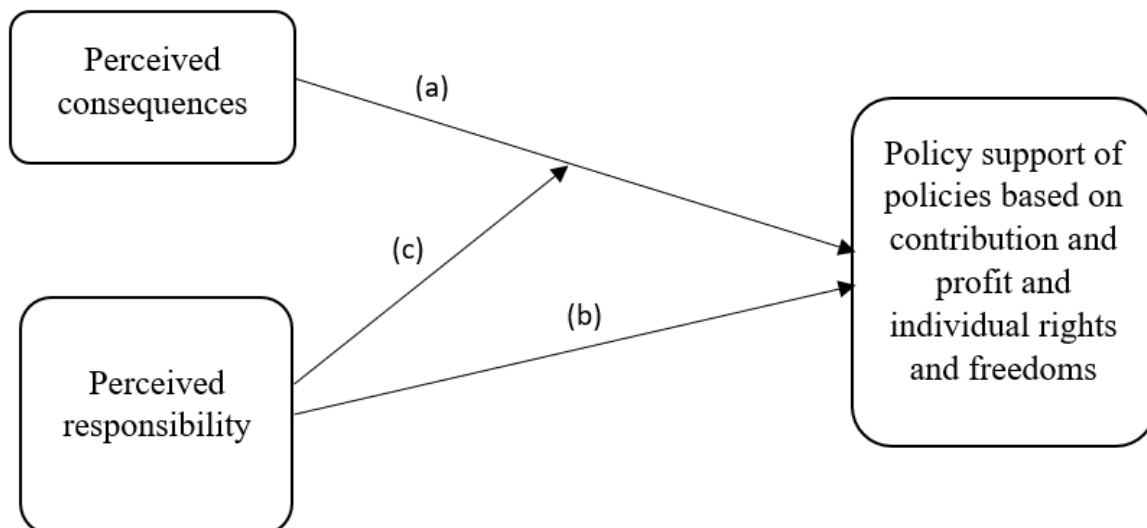
Method

Participants

In total, 144 participants filled out the survey. We excluded 15 participants from the data analysis because they did not finish the survey. In addition, three participants were removed as outliers (z-score > 3 for the duration of time they needed to fill out the survey). We did this because these participants took several hours to fill in the questionnaire, presumably because they finished the survey in multiple sessions. In this case, the manipulation within the survey would not have the same effect. Thus, the final sample consists of 126 participants. The average time needed to finish the survey was 27.41 minutes, excluding the participants that were deleted from the sample ($SD = 87.87$). 44.44 % of the participants were male, 55.56 % of the participants were female, and no participant indicated a different gender than male or female. The average age across the sample is 39.41 ($SD = 18.28$, $min = 16$, $max = 90$). In addition, we asked the participants about their nationality at the beginning of the survey. 51.59 % of the participants are Dutch, 30.16 % of the participants are German, and 18.25 % of the participants have another nationality. Thus, at least over 80 %

of the participants stem from a WEIRD (Western, Educated, Industrialized, Rich, and Developed) country. We can therefore speak of a WEIRD sample.

Procedure

Data collection was done via a convenience sample. We asked participants in person or via text message to complete the survey. Participation was voluntary and anonymous, and no financial compensation or any other kind of rewards were offered after participation. The data collection was part of writing our bachelor theses within the project "Promoting sustainable behavior and policy support in net-zero transition" at the University of Groningen, Netherlands. Before collecting the data, I conducted a power analysis for my research model aiming for medium effect size ($f^2 = 0.0625$), with $\alpha = .05$, and *power* $= .80$. This analysis resulted in a recommended sample size of 126 participants. As a condition of participation, the participants had to be older than 16 years and understand one of the three languages (English, Dutch, and German) in which the survey was offered. The Ethics Committee of the Faculty of Behavioral and Social Sciences at the University of Groningen, Netherlands, exempted the study from further review. We collected the data between the 27th of April and the 3rd of May in 2023.

Design

First, the participants received general information about the survey, including the study's relevance, and goal, a summary of what will be asked of them, and the fact that participation is voluntary. In addition, the participants were informed about how we will utilize their responses for our research topics and how their data will be treated. Then the participants had to give consent to take part in the study to continue. In the main part of the survey, the participants answered questions about seven different blocks: personal values, sustainable clothing, sustainable diet, sustainable consumption, corporate environmental responsibility, carbon offsets, and environmental policies. The questions of my part of the

survey can be found in Appendix B. The researchers were not present when participants filled in the survey, which was taken individually, online via Qualtrics (Qualtrics, 2023).

The goal of my analysis is to find out how *perceived consequences* (independent variable) and *perceived responsibility* (independent variable) might influence *policy support* for a climate cost allocation principle (dependent variable). All variables are measured quantitatively. Firstly, participants were presented with a short text explaining that we need to figure out who has to pay for climate adaptation and mitigation. Then, participants were randomly presented with either an explanation of measures fitting a contribution and profit principle or an individual rights and freedoms principle. All descriptions are stated in Appendix B. Next, PC were measured by asking the participants to imagine how these policies would influence them on a 7-point Likert scale (1 = *very negatively* to 7 = *very positively*). This question measured PC for both individual rights and freedoms ($M = 3.56$, $SD = 1.21$), and contribution and profit ($M = 4.00$, $SD = 1.44$). After that, the support for the principle was measured on a 7- point Likert scale (1 = *strongly oppose* to 7 = *strongly support*). For support for individual rights and freedoms, the mean is 3.52 ($SD = 1.72$, $N = 64$), meaning support is somewhere between 'somewhat opposed' and 'neither support nor oppose'. For contribution and profit, support is somewhere between 'neither support nor oppose' and 'somewhat support' ($M = 4.95$, $SD = 1.57$, $N = 62$). Lastly, participants were asked how much responsibility they think they have to counteract climate change on a 7-point Likert scale (1 = *not at all* to 7 = *a great deal*). This question measures perceived responsibility for individual rights and freedoms ($M = 4.66$, $SD = 1.30$), and contribution and profit ($M = 4.82$, $SD = 1.29$).

Data analysis

In the first step, I conducted descriptive analyses of the age, gender, and nationality of the participants, as reported above. Central tendency measures (mean) and measures of

distribution (standard deviation) were conducted for each variable. In the next step, I checked

my hypotheses by looking at Pearson's correlations and a multiple regression analysis to test

the hypotheses. In addition, I tested for multicollinearity (Variance Inflation Factors (VIF)),

homoscedasticity (residuals vs. dependent variable scatter plot), linearity (scatterplot), and

multivariate normality (Q-Q Plot Standardized Residuals). Correlations between the

independent and dependent variables were statistically significant, and for the model

including independent variables PC and perceived responsibility all assumptions are met,

therefore, the analysis could proceed. This study aims to research how well a model including

PC and perceived responsibility can explain the dependent variable. Therefore, all results are

examined as part of this model. I conducted a simple linear regression analysis in SPSS, using

an alpha level of .05 for all statistical tests.

Instruments

For constructing the survey, we used the software Qualtrics (Qualtrics, 2023). The

participants were able to access the survey via a web link that was sent to them. The power

analysis before the data collection was run in the software *GPower 3.1* (Faul et al., 2007). For

the statistical analysis, I used the program SPSS (version 27).

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Results

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In the first hypothesis, I expect that the more negative the PC, the lower the support

for both allocation principles will be. Firstly, I found a significant effect of PC on the support

for policies based on individual rights and freedoms ($b = 0.45$, 95 % CI [0.12, 0.78], $t(60) =$

2.73, $p = .008$). That is, people who perceive more positive consequences, support policies

based on the principle of individual rights and freedoms more than those who perceive more

negative consequences. Therefore hypothesis 1a is accepted. Secondly, the PC of

contributions and profit also have a significant effect on the support for policies based on this

principle ($b = 0.29$, 95 % CI [0.03, 0.55], $t(60) = 2.20$, $p = .032$). Therefore people who

perceive more positive consequences, support policies based on the principle of contribution and profit more than those who perceive more negative consequences. This means hypothesis 1b is also accepted. To conclude, for both principles PC have a significant effect on the support for policies based on the principle. This supports the first hypothesis.

The second hypothesis assumed that perceived responsibility will influence people's support for policies based on both principles. Specifically, for hypothesis 2a., I assumed that for policies based on individual rights and freedoms, the higher the perceived responsibility of the individual, the lower the support for policies. Because those with high perceived responsibility prefer policies based on contribution and profit, which opposes policies based on individual rights and freedoms. For this principle, the effect of perceived responsibility on policy support was significant ($b = 0.37$, 95 % CI [0.07, 0.68], $t(62) = 2.45$, $p = .017$). That is, people with higher perceived responsibility are more likely to support policies based on individual rights and freedoms, compared to those with lower perceived responsibility. This does not support hypothesis 2a. On the other hand, hypothesis 2b. assumes that for contribution and profit, higher perceived responsibility relates to the higher support of policies based on contribution and profit. The results show that the effect of perceived responsibility on the support of policies based on contribution and profit was also significant ($b = 0.43$, 95 % CI [0.14, 0.72], $t(60) = 2.93$, $p = .005$). That is, those with higher perceived responsibility are more likely to support policies based on the principle of contribution and profit, compared to those with lower perceived responsibility. This supports hypothesis 2b.

The third hypothesis assumes that the effects of PC and perceived responsibility on policy support interact. To test hypothesis 3, I started by conducting a regression for the model with all variables included, meaning PC, perceived responsibility, and the interaction between PC and perceived responsibility. The model for individual rights and freedoms ($F (3, 60) = 5.23$, $p = .003$) is significant, however, the interaction term is not ($b = 0.13$, $t(60) =$

1.28, $p = .205$). Therefore, hypothesis 3a. is rejected. The same is true for contribution and profit, the model is significant (F (3, 58) = 7,52, $p <.001$), whereas the interaction term is not ($b = -0.13$ $t(60) = -1.40$, $p = .167$). thus, hypothesis 3b. is rejected. There is no evidence to suggest an interaction between PC and perceived responsibility.

Discussion

This thesis investigates the relationship between PC, perceived responsibility, and policy support for two climate cost allocation principles. No research has examined the reasoning behind public support for policies based on Kanne and Theelen (2022), and gaining more insight will help to increase policy support. Firstly, I expected more negative PC to relate to lower policy support for policies based on either principle. Thus, when people perceive more negative consequences of the policy, they are less likely to support the policy (H1a. and H1b.). The results support these hypotheses. Secondly, I expected perceived responsibility to influence policy support, and that the effect differs per principle. Specifically, I expected higher perceived responsibility to relate to higher support for policies based on contribution and profit (H2a.), and lower support for policies based on individual rights and freedoms (H2b.). H2a. is supported whereas H2b. is not. This means higher perceived responsibility is related to higher support for policies based on either principle. Lastly, I assumed there would be an interaction effect between PC and perceived responsibility. Following the first and second hypotheses, I expected support for policies based on contribution to be highest when PC were more positive and perceived responsibility was higher (H3a.). Additionally, I expected support for policies based on individual rights and freedoms to be highest when PC were more positive and perceived responsibility was lower (H3b.). I did not find an interaction effect between the PC and perceived responsibility.

Theoretical implications

Perceived Consequences

The results of this research support hypothesis 1, as I found support for policies is lower when PC are more negative. This affirms previous research, which found more negative PC are related to lower policy support (Dan et al., 2007; Drews & Van Den Bergh, 2015; Geiger et al., 2021). For example, Bechtel and Scheve (2013) measured a direct decrease in policy support when costs increased. This thesis adds to the existing literature by concluding there are no differences in the effect of PC between climate policies based on the different fairness principles proposed by Kanne and Theelen (2022). Further research might focus on different types of PC. For example, Kallbekken and Saelen (2011) found that PC for others are a stronger predictor for support for fuel taxes than personal PC. Therefore, those who expect a policy to have negative consequences for their loved ones are less likely to support the policy than those who expect negative consequences for themselves. Furthermore, the PC of climate change also influence policy support, the more people perceive the negative consequences of climate change, the more likely they are to support climate policies (Dan et al., 2007; Perlaviciute et al., 2022). Since the PC of climate change and the PC of policies both relate to policy support, further research might investigate whether they are related to each other, and which PC are more significant in predicting policy support. Examining these different types of PC could bring more insight into the effects of individuals' expectations of climate change and policies, and how this influences policy support.

Perceived responsibility

Higher perceived responsibility is related to higher policy support for both principles. This contradicts Leiserowitz (2006), and Smith and Leiserowitz, (2013) as they state those with an individualistic ideology support policies involving much government interference less. Furthermore, it contradicts the logic that the principles of contribution and profit and individual rights and freedoms oppose each other so that those high in perceived responsibility would be less likely to support policies based on individual rights and

freedoms. This research found no differences in the effect of perceived responsibility per principle. Previous research, stating that perceived responsibility enhances climate policy support in general, supports this result (Markowitz & Syropoulos, 2022). Therefore, no differences between policies might exist. Another explanation might be that the principles are broad. For example, for individual rights and freedoms, participants might agree with an equal tax but disagree with the idea that everyone has to deal with damage to their property themselves. However, I mentioned both examples in the same question. This also occurs for the principle of contribution and profit. In the provided text, a policy designed to have polluters pay more, and a policy designed to make those who act more sustainable pay less. However, previous research has found a difference in policy support for push and pull policies (Drews & Van Den Bergh, 2015). To illustrate, push policies are designed to push people away from unsustainable behaviors, for example via a carbon tax. Pull policies are designed to pull people towards sustainable actions, for example through subsidies on solar panels. However, the principle of contribution and profit included both push and pull policies. Therefore, participants might agree with some policies based on this principle, and disagree with other policies. This might result in answers closer to the median (for this survey, answers closer to 4), which means differences in support are less likely to be found. Therefore, further research might investigate whether the difference between push and pull policies played a role in policy support for these principles. This may be done by measuring support for each principle twice. Thus, following the method of this research but providing examples of push policies to half of the participants and examples of pull policies to the other half of the participants.

Interaction Effect between Perceived Consequences and Perceived Responsibility

Even though past research might suggest a relationship between PC and perceived responsibility, I found no interaction effect. This is supported by evidence showing people

with high perceived responsibility are willing to support pro-environmental policies, even when there are negative personal consequences (e.g. Anderson, Bernauer, & Balietti, 2017). Steg et al. (2013) found a similar result, as those with a strong perceived responsibility act more sustainably, even when there are costs involved. These findings support the results of this thesis, meaning PC and perceived responsibility are not related to each other.

Steg et al. (2013) hypothesized that perceived responsibility is based on moral values rather than hedonic values, since people high in perceived responsibility act more sustainably, even when this is associated with less pleasure. Their results supported their hypothesis. Therefore the effect of perceived responsibility does not depend on personal consequences, but on intrinsic moral motivation. This helps explain the results of this thesis by illustrating that perceived responsibility is based on moral values, whereas PC are based on hedonic values, therefore, they are not related. Furthermore, the idea that PC and perceived responsibility are separate motivations is affirmed by Bidwell et al. (2010), who found climate policy support is lower for people citing economic reasons for policy support, compared to those citing moral reasons.

Practical Implications

Since the allocation principles by Kanne and Theelen (2022) are proposed to the Dutch government and might be used by policymakers in the future, these new insights might help to enhance policy support in The Netherlands. However, for any practical implications causal relationships need to be determined since it is unclear whether the variables affect policy support. Therefore, the first recommendation would be to continue this research experimentally or longitudinally. If PC and perceived responsibility are found to influence policy support, this might have implications for policy design and framing.

Framing refers to the way policymakers communicate the policy to the public. According to Severson and Coleman (2015), this framing has to fit the population. They

researched three types of framing of climate policies among people with opposing political ideologies. For example, when policies were introduced by emphasizing scientific information on the positive effects of policies, the difference in policy support between conservatives and liberals was no longer significant (Severson & Coleman, 2015). Thus, the framing of policies influences policy support. Emphasizing the positive PC of policies, like saving money or avoiding penalties, might enhance policy support. However, the evidence is not unambiguous, as Gardner et al. (2017) found support for policies that emphasize personal benefits does not differ from policies emphasizing climate benefits. However, personal relevance mediated this effect. That is, if participants did not find the personal benefits relevant, policy support was not enhanced by reframing the policy to be beneficial for the individual (Gardner et al., 2017). As Severson and Coleman (2015) state, the correct framing has to be applied to the correct population. Therefore, further research may determine whether policy support for allocation principles in The Netherlands can be increased by reframing policies.

Secondly, enhancing perceived responsibility might help to increase policy support. The Norm Activation Model by Schwartz (1977) predicts that awareness of the consequences of unsustainable behavior activates perceived responsibility (Cotton et al., 2013). Thus, when people are aware of the impact of unsustainable and sustainable actions, this creates a moral commitment to act more sustainably. Furthermore, Cotton et al., (2013) argue awareness of consequences is a necessity for perceived responsibility. That is, as long as people are not aware of the consequences of their actions, they will not change their behavior. Therefore, policymakers might enhance perceived responsibility by raising awareness of the consequences of both sustainable and unsustainable behavior. This may be done by educational media coverage or climate change education in schools.

As stated, emphasizing positive personal consequences of climate policies might help to make PC more positive, thereby possibly enhancing policy support. However, since this research found that the effects of PC and perceived responsibility do not relate, they have to be approached in distinct ways. Steg et al., (2013) found emphasizing the positive effects of policies does not enhance policy support for those high in perceived responsibility, since they are already intrinsically motivated. Thus, policymakers should avoid emphasizing personal benefits in populations with high perceived responsibility. Importantly, rewarding sustainable behavior might even undermine intrinsic motivation (Bolderdijk et al, 2012; Markowitz & Sharif, 2012; Steg et al., 2013). In order to ensure that people continue to behave sustainably, rewards would need to be given on a recurring basis, which could be costly (Steg et al., 2013). For example, continuous discounts to make sure people recycle more. Therefore, Bolderdijk et al. (2012) suggest emphasizing moral motives to encourage pro-environmental behavior instead of economic motives. They illustrate this by using posters, either saying 'Want to save money? Check your car's tire pressure' or 'Want to protect the environment? Check your car's tire pressure' (Bolderdijk et al., 2012, p. 1). They found the second message, focusing on moral reason, resulted in more compliance. To conclude, different strategies need to be implemented for those with higher or lower perceived responsibility.

Limitations of the Thesis

One of the limitations of this research is the survey itself. Firstly, the questions have not been tested on validity and reliability. This means the questions might not measure the exact right concept it intends to measure. The order of the questions might also have influenced the answers. Since perceived responsibility was measured last, after the text explaining one of the principles was presented, this text might have influenced participants' ideas about how much responsibility they feel. Any further research might ask about perceived responsibility before explaining the cost allocation principles. Moreover, no causal

conclusions can be made. Therefore, it is unclear whether the independent variables influence the dependent variable. For practical uses in policy implementation strategies, determining whether there is a causal relationship between the variables, via experimental of longitudinal research, might be useful. Secondly, the sample limits generalizability. The sample was a convenience sample, and therefore not random. Additionally, the sample is a WEIRD sample, meaning the results cannot be generalized to non-WEIRD populations. Additionally, I did not reach the sample size needed for a power of .8, which might distort the results since insufficient power might mean true effects are not detected. Thirdly, social desirability plays a role in environmental psychology research (Klöckner & Vesely, 2020). This means participants tend to answer in a way they believe makes them look good, instead of answering honestly. For example, participants might feel like they should support climate policies and adjust their answers to fit these expectations. This is a problem, especially in self-report measures, since the results would not reflect reality accurately, limiting the utility of the results. However, the fact that participants were anonymous might have reduced social desirability. Still, it is unclear whether social desirability influenced the results of this research, so the results should be handled with care.

Conclusion

This thesis focuses on the relationship between PC, perceived responsibility, and policy support for allocation principles. The results showed more positive PC and higher perceived responsibility are related to higher policy support. I found no differences in the effects of perceived responsibility on policy support for different principles. Furthermore, PC and perceived responsibility show no interaction. These results are in agreement with research on negative PC on policy support (e.g. Dan et al., 2007; Drews & Van Den Bergh, 2015) and some previous research on perceived responsibility (Markowitz & Syropoulos, 2022). However, it opposes research on individualism and policy support (Leiserowitz, 2006; Smith

& Leiserowitz, 2013). For any practical implications, further research should determine whether there are causal relationships between PC, perceived responsibility, and public policy support of allocation principles. Strategies to enhance policy support can include highlighting personal benefits, increasing perceived responsibility, and reframing policies to emphasize either positive effects or individual responsibility. Increasing policy support will make allocating climate costs easier by enhancing policy adherence and reducing resistance (De Vries et al., 2023).

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Appendix A

Allocation Principles and Statements

Allocation principle	Statement
Individual rights and freedoms	
Existing rights	Dutch inhabitants who, because of earlier purchases, are in a situation that makes sustainability more expensive, have to pay less to the climate policies.
Own responsibility	Dutch inhabitants who have to deal with damage because of climate change have to pay themselves.
Per capita	Costs of climate policies have to be distributed among all Dutch inhabitants, everyone pays the same amount.
Contribution and profit	
Polluter pays	Dutch inhabitants who emit more CO2 need to pay more to climate policies than those emitting less.
Merit	Dutch inhabitants who are already trying to counteract climate change, have to pay less than those who do not or have not yet.
Profit	Climate change yields profit, Dutch inhabitants who profit have to pay more to climate policies.

Note. Adapted from *Rechtvaardigheid bij Klimaatbeleid*, by Kanne & Theelen, 2022, p. 39.

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Appendix B

Section Policies survey

Note: the participants will randomly be put into one of the two following groups:

Group: Individual rights and freedoms

English ⌄

In this final section, we are interested in what you think about who has to pay to help counteract climate change.
There are several ways to mitigate and adapt to climate change. However, we need to decide who has to pay for these measures. One type of the policies is to make sure **people have individual responsibility and existing rights.** For example, people whose house was damaged by flooding have to pay for the repair themselves. Another example is that everyone has to pay an equal carbon tax to the government to compensate for the damages.

Please think about the policy mentioned above. If this policy was implemented, how would it affect you?

This policy would affect me...

Very negatively	Negatively	Somewhat negatively	It would not really affect me	Somewhat positively	Positively	Very positively
○	○	○	○	○	○	○

On a scale of 1 to 7, how much would you support climate policies based on this way of allocating the costs?
That is, everyone has to pay the same amount of money, regardless of their CO2 emissions. This money could be used to prevent the floods caused by climate change.

Strongly oppose	Oppose	Somewhat oppose	Neither support nor oppose	Somewhat support	Support	Strong support
○	○	○	○	○	○	○

On a scale of 1 to 7, how much responsibility do you think you have to help counteract climate change?

None at all						A great deal
○	○	○	○	○	○	○

Group: Contribution and profit

English ⌄

In this final section, we are interested in what you think about who has to pay to help counteract climate change.
There are several ways to mitigate and adapt to climate change. However, we need to decide who has to pay for these measures. One type of the policies is to make sure those **who contribute more to climate change have to pay more.** For example, people emitting a lot of CO_2 by flying, eating meat or driving a polluting car have to pay more. On the other hand, those **who are already putting in a lot of work to adapt to climate change would pay less.** For example, people already insulating their house, not eating meat or not driving a car will pay less.

Please think about the policy mentioned above. If this policy was implemented, how would it affect you?

This policy would affect me...

Very negatively	Negatively	Somewhat negatively	It would not really affect me	Somewhat positively	Positively	Very positively
○	○	○	○	○	○	○

On a scale of 1 to 7, how much would you support climate policies based on this way of allocating the costs?
That is, those who emit more CO_2 have to pay more money than those who emit less CO_2. This money could be used to prevent the floods caused by climate change.

Strongly oppose	Oppose	Somewhat oppose	Neither support nor oppose	Somewhat support	Support	Strong support
○	○	○	○	○	○	○

On a scale of 1 to 7, how much responsibility do you think you have to help counteract climate change?

None at all						A great deal
○	○	○	○	○	○	○