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Goal Framing as a Tool for Changing People's Car Travel Behavior in Sweden

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Abstract: This paper reports on a study of car drivers' assessment of a sustainability policy involving increased car parking fees in Swedish city centers. The aim of the study was to investigate how framing of information in text and pictures influences acceptance of increasing car parking fees and how values, general beliefs and norms as well as measure-specific beliefs influence the acceptability of the measure. Drawing on Goal Framing Theory, the acceptance of a parking fee policy was tested using three different goal frames (hedonic, gain and normative); the frames were compared with each other and a control message. The study was based on a survey directed to residents (18 to 75 years of age) in 51 larger municipalities in Sweden. The survey had an experimental design. Respondents were presented with a scenario of an increase in parking fees to promote environmental sustainability. The scenario was presented in three ways (manipulations), highlighting hedonic (e.g., emotional), gain, and normative aspects, respectively, in text and pictures. The results showed that the three message frames had different effects and were overall more effective than the control message in engendering the desired reduction in private car use and, thus, the intended environmental impact. Further, the degree of acceptability of the increased parking fee influenced the expected behavioral change in the groups receiving a goal framed message in relation to the parking fee measure. Implications from a sustainability perspective concern the importance of how environmental policies are framed when communicated to the public in order to increase acceptance and support.

Keywords: daily travel; parking fees; experimental setting; goal framing; sustainability policy measures

Highlights (3–5):

- Framing policies and messages affect acceptance and behavioral change
- The degree of acceptability influences the expected behavioral change
- Values, beliefs and norms are important antecedents to acceptability of a transportation-related policy

1. Introduction

Mobility is regarded as a fundamental prerequisite for economic development. Moreover, people's ability to participate in society and daily activities through having access to transport resources can be considered an indicator of well-being and welfare e.g., [1]. However, the negative aspects of travel, such as fossil oil depletion, air pollution, noise, congestion, land use and greenhouse gas emissions, cannot be overlooked and need to be handled to facilitate development of a more sustainable society.

As long as mobility is vital to economic growth, and to individuals' welfare and freedom, the demand for travel is not expected to decrease in the near future [2,3]. Instead, a recent estimate is that passenger transport (in kilometers) in the EU will increase by 42% by 2050 [4], and in the US by 30–50% by 2100 [5]. The transport sector in the EU contributes to about 20% of the greenhouse gas (GHG) emissions, the largest contributor being road transport, which accounts for 72% [6]. In addition, almost regardless of fuel, all car traffic contributes to emissions of hazardous particles and, e.g., nitrogen oxides (NOx). Although electric cars give off no tail pipe emissions, they still give rise to hazardous particles from vehicle breaking and road/tire wear in the form of metals, rubber and asphalt residue.

Reduced energy consumption, and thus GHG emissions, can be achieved through better fuel efficiency, cleaner technologies, modal shifts, less travel, smaller cars, and more energy efficient driving behavior [6]. However, technological improvements or economic incentives will most likely not be enough to mitigate the negative effects of car traffic [3,7]. Technological improvements have also been argued to be counterproductive in reducing emissions, because, for example, better fuel efficiency can result in an increase in driven kilometers [6,8]. A powerful, albeit less often discussed, way to reduce negative environmental effects such as pollution, noise, number of traffic accidents, land use for roads, highways, parking, etc., is to reduce car traffic all together [8].

A change in travel mode may help mitigate the negative effects of travel without jeopardizing the need for mobility, for example, shifting from car driving to walking or taking public transport on shorter trips, and from air to railway travel for longer trips. To change people's travel behavior and encourage alternatives to car travel, different measures have been implemented, ranging from hard policies (sticks)—such as banning car traffic on certain routes or at certain times—to incentives (carrots)—such as improved bicycle paths—to information (sermons) stressing, for example, the negative effects of car traffic and positive effects of non-motorized travel. Measures can also be combined, for example, sticks, like increased parking fees and carrots, like subsidized public transport, or carrots and sermons (see, e.g., [9,10]). However, the perspective of the users—be they car drivers, pedestrians, or users of public transport—is important if we are to understand how measures are perceived [11] and, ultimately, whether or not they will be accepted.

If policies and actions introduced to change travel behavior are to have the intended effect, they need to be considered fair and effective by the users. How messages and information are framed affects how recipients will perceive their credibility e.g., [12,13]. For example, Davis [14] found that framing had a significant impact on believability of environmental messages when framed as gain vs. loss, and targeting the current vs. future generation. The effect of framing can be strengthened or weakened by other factors, for example, temporal distance, previous experience, and recipients' values, knowledge, and environmental concerns [13].

In the present article, car drivers' assessment of increased parking fees in city centers is in focus. One objective of a parking policy, such as increasing costs or limiting parking places, is to balance supply with demand [15], thereby achieving positive environmental effects. People's reactions to such a policy are, however, not always straightforward. Parking policies can be effective for achieving a modal split and solving congestion problems [15,16], but also cause a rebound effect when drivers cruise around trying to find parking, thereby increasing congestion [17]. When attempting to change behavior or achieve acceptance of policies, it is important to consider factors adjacent to such choices and acceptance, e.g., to ask: What are the motivating factors behind a behavior? Goal Framing Theory (GFT) [18,19] has focused on three motivating goals underlying preferences: the hedonic, gain, and normative goal frames (explained further below). These goal frames can be important to different degrees, depending on the situation; they guide attention toward what information is taken into consideration and what behavioral choices are perceived to be available. Therefore, these goal frames can be used as a basis for framing a policy measure.

The aim of the present article is to investigate how framing of information in text and pictures influences acceptance of increasing car parking fees, and how values, general beliefs and norms as well as measure-specific beliefs influence the acceptability of an increased parking fee. The study,

using an experimental method with randomized groups, adds to the literature on the effects differently framed messages can have on how a given policy is perceived. This represents a step further than measuring policy attitudes using survey methodologies alone. Concerning parking policies, the study contributes by informing policymakers of the importance, both of communicating to the public the reasons underlying the policies and of different ways to do this; something that has not been the focus of previous research in the parking policy literature [15,20].

The data were gathered using an online survey including three experimental treatments (hedonic, gain and normative text and pictures) and a control group (no treatment) as well as measures of attitudes, beliefs, norms and sociodemographic factors. The respondents' different socio-demographic characteristics were controlled for in the analysis. A total of 802 residents in larger Swedish cities participated in the survey. The study thus contributes insights into both the effect of framing a transportation-related hard policy (parking fee) and how values, beliefs and norms influence acceptance from a Goal Framing Theory perspective.

2. Previous Studies

2.1. Intervention Measures

Transport measures may be aimed at encouraging a behavior, such as using public transport, or at discouraging a behavior, for example, driving a car in urban settings. In the environmental policy literature, the terms *sticks* and *carrots* have been used to distinguish between the various means used to induce behavioral change [11]. Sticks, or regulations, are coercive measures that deter or discourage a certain behavior; transportation examples being congestion tolls, pricing policies and parking restrictions. The term carrots refers to measures that encourage a certain behavior, such as construction or improvement of bicycle lanes and increased public transport frequency [11]. A further distinction of measures and policies is made, for example, in research on policy implementation and evaluation, where sticks and carrots are complemented with the term *sermons* [21]. Sermons take the form of information, and as such are an attempt to influence people through transfer of knowledge, communication of arguments and persuasion [21,22].

Sticks, carrots and sermons have their respective advantages and disadvantages, which are largely contextual. Measures such as road tolls and increased parking fees are examples of sticks, and although the cost benefits (money from increased taxes that can be invested in active travel mode measures) have been acknowledged, the use of such measures has raised concerns about equity [23]. Still other studies have pointed out that reduced parking subsidies or increased parking fees are effective tools for decreasing car traffic [11]. Within the transport sector, information campaigns meant to influence people's behavior by addressing, e.g., the danger of speeding or the health benefits of active travel modes can be effective. Scheepers et al. [24] reviewed studies evaluating the effectiveness of different transport interventions designed to encourage a shift from car travel to active travel modes. The results indicated that mass media campaigns generally had positive effects on mode shift when combined with other measures (e.g., economic tools). The authors concluded that, as there is a lack of studies on interventions based on mass media campaigns only, the effectiveness of campaigns alone can be questioned.

In an Australian study, comparing the outcome of a travel plan employing both sticks (parking restrictions and introduction of parking fees at work) and carrots (improved public transport) with a plan using carrots alone (encouraging active travel modes to work), Petrunoff et al. [10] found that the combined approach was eight times more effective (in reducing the number of staff who drive alone to work) than the single measure approach. These results, i.e., effectiveness of parking restrictions and increased parking fees, are in line with findings from other studies e.g., [25,26].

Based on the reported merits of combined approaches, our experiment employs an increased parking fee (stick) and information (sermon) about the advantages of the measure.

2.2. Parking Fees

The full cost of traveling affects the demand for traveling, and parking fees in cities are part of the cost that travelers experience. Such fees are also a commonly used form of stick, or hard policy [20]. Increased, or high, parking fees are argued to contribute to reduced car travel [27] and are used to achieve a modal split [15]. Although parking fees have also been found to be second best to congestion charges in reducing congestion [16], they have been employed in many cases to reduce travel demand, largely because increasing fees is a simple measure to employ [16]. Its efficiency was also shown in Albert and Mahalel's [16] study of university employees in Haifa, where 54% of participating drivers preferred other options (park outside the campus or use a shuttle) to avoid the parking charge. Marsden [28], in his review of different parking policies, also noted that various parking schemes led to an increase in carpooling, walking or bicycling to work. A Norwegian case study of employees at the Norwegian Public Road Administration revealed that car transport declined after the implementation of parking fees, while public transport increased [27].

However, parking fees can have negative, or rebound, effects. Cruising around to find available parking space can lead to increased traffic volume and emissions [15]. Businesses and retailers in city centers have also expressed their concern that limited parking due to high parking fees will have negative effects on their turnover e.g., [29,30].

2.3. Goal Frames and Attitudinal Factors

Several theoretical frameworks have been used in research on the importance of attitudinal factors for pro-environmental behaviors and intentions, such as the Theory of Planned Behavior (TPB) [31], the Norm Activation Model (NAM) [32], the Value Belief Norm model (VBN) [33], and the more recently developed Goal Framing Theory (GFT) [18,19]. Both the NAM and VBN (partly sprung from TPB) state that the basis of norm activation is the influence of different basic values, a perceived threat (e.g., awareness of consequences or problem awareness), and an individual's own feeling of responsibility and ability (self-efficacy) to act so as to avoid the consequences of the perceived threat. An activated personal norm is manifested as a feeling of personal moral obligation to act in the current behavioral domain. Ample research has been conducted on the TPB, NAM and VBN models in relation to a wide range of environment-related behavioral choices [34–45]. Less work has been published on GFT.

According to GFT [18,19], behavior is governed by our motivation and the different goals people have in a given situation. Three goal frames have been identified as specifically important in relation to behavioral change: the hedonic, gain, and normative goal frames. The three goal frames and related attitudinal factors described in GFT have been studied separately and extensively [19,28,40,46–53]. However, GFT combines the two strongly established fields of research on the influences of gains and losses and the normative influence, as seen within the theoretical fields of NAM and VBN, with the less researched field of affective influence e.g., [54]. A hedonic goal frame is thought to cause the individual to focus on feeling good about how he/she acts, and can involve avoiding demanding behaviors and instead choosing behaviors that maximize wellbeing and excitement. A gain goal frame makes the individual aware of changes in her/his personal resources, such as money and status. Lastly, a normative goal frame causes the individual to seek out behaviors that are experienced as the correct thing to do, that is, what one ought to do. These goal frames can have different degrees of importance for the individual and can guide attention concerning what information is taken into consideration and what behavioral choices are perceived as available. The focal goal influences our thoughts and behaviors most, while the other goals have more influence in the background, either by strengthening (if the goals are compatible) or by weakening (if the goals are in conflict) the power of the focal goal [18,19].

A sustainability-oriented or pro-environmental behavior can thus be the result of hedonic motivations (e.g., because it is exciting or gives a sense of wellbeing), gain motivations (e.g., to save money), or normative motivations (e.g., it is perceived to be the right thing to do). These goal frames

can, however, also influence behavior in a negative direction; that is, when the individual, for hedonic, gain, or normative reasons, chooses to continue with an environmentally harmful behavior. When goal frames are in focus, as they are in the present study, it is important to consider values, beliefs and norms [15]. Values are said to influence the extent to which hedonic, gain, and normative goals are specific to an individual in a given situation, which is important in relation to whether a particular goal will become focal in that situation. Values serve as guiding principles in our lives [55], as they transcend situations and affect a wide range of beliefs, attitudes, norms, intentions and behaviors [56–58]. As values have primarily been shown to influence intentions and behaviors indirectly, via attitudes, behavior-specific beliefs and norms e.g., [19,31,35,36,41,42,47,48,59–76], such factors are of importance when studying the full GFT theory.

Encouraging sustainability-oriented and pro-environmental behavior, such as reducing private car use, using different kinds of interventions or policies, is of great importance. In that process, the antecedents and motivations related to the desired behavior and the acceptance of these policies need to be better understood [77]. The present study contributes to improved understanding by investigating the importance of framing.

3. Methods and Data

3.1. Survey

The study is based on a survey, including an experimental design with a scenario and a questionnaire part, directed to residents (18 to 75 years) in 59 Swedish municipalities, comprising the metropolitan areas of Stockholm (26 municipalities), Gothenburg (13 municipalities) and Malmo (12 municipalities), and 8 larger urban municipalities in Sweden. The study was carried out in 2018. The experimental design consisted of the respondents being presented with a scenario of an increase in parking fees by SEK 2000 (≈ Euro 200, corresponding to approximately one third of the average housing cost per month) per month in the city. The scenario was presented in three ways (manipulations), highlighting hedonic (e.g., emotional), gain, and normative aspects, respectively, in text and pictures. In addition, a control group was included that did not receive any picture and only limited text. This decision was based on the reasoning that rather than using a purportedly neutral picture, which could be interpreted in different ways, no picture would make the comparisons to the control condition more just and realistic.

The manipulations were designed by the authors, while data collection was carried out by a survey company. The respondents were sampled from a web panel containing a representative sample of the Swedish population with regard to sex, age group and income. The panel consisted of members who were approached and selected to be representative and then to complete the surveys. As the researchers aimed for 200 respondents in each group (including the control group), the survey company sent out invitations to the panel members until the quota in each group had been met (the final number of respondents assessing the increased parking fee was 802). To ensure that the respondents were representative of the population with respect to sex and age in the three metropolitan areas and large cities, respectively, the invitations were continuously directed to adjust for any misrepresentation. In the final sample, respondents with a university education longer than two years were over-represented.

The questionnaire consisted of three parts: background questions, the experimental treatment, and attitude questions. Initially, a number of questions describing the respondent's situation were asked: access to a car in the household, driver's license, residential setting, household size, frequency and purpose of car trips, and travel time and travel distance to work.

In the second part, which was the actual experiment, the respondents were given information about 'Anna,' a woman living outside a non-specified middle-sized Swedish city. Anna was described as working in the city and commuting daily by car to work, as the existing access to public transport was limited. In each group, the respondent was presented with a letter addressed to Anna. In the letter, the increase in parking fee was justified by referring to poor air quality. The emphasis was either

on the outcome of a more attractive city and better health for its citizens (hedonic goal frame), on an increase in the ease of finding parking spaces, thereby saving time (gain goal frame), or on the moral obligation to reduce the number of cars, as an important part of the solution to climate problems (normative goal frame). Depending on the three goal frames, the consequences for the individual were described and visualized in pictures (see Table 1). The respondents were then asked about how fair and how effective they thought Anna would find the measure (increased parking fee), Anna's attitude toward the measure, how prone the respondents thought she would be to accepting the measure, and the likelihood she would stop driving her car to work.

Table 1. Description of the information given to the respondents about the measure of increased parking fees in three goal frame groups (Gain, Hedonic, Normative) and one control group.

GOAL FRAME	INCREASED PARKING FEE
HEDONIC 	A letter to 'Anna' in which the reasons for the measure are described: A more attractive city, and better health for its citizens.
GAIN 	A letter to 'Anna' in which the reasons for the measure are described: Easier to find parking spaces, thereby saving time.
NORMATIVE 	A letter to 'Anna' in which the reasons for the measure are described: A moral obligation to reduce the number of cars, as an important part of the solution to climate problems.
CONTROL <NO PICTURE>	Information about 'Anna' and information about the increased parking fees, without any description of positive consequences of the measure.

Pictures downloaded from https://www.pexels.com/photo/person-woman-relaxation-summer-135013/; https://www.pexels.com/photo/analogue-classic-clock-clock-face-280264/. https://www.pexels.com/photo/cold-nature-cute-ice-48814/.

In the third part, after the experimental manipulations, the respondents assessed statements related to values, general beliefs and norms, measure-specific beliefs (parking fee), and measure acceptability and behavioral change. Values were assessed using the Environmental Portrait Value Questionnaire (E-PVQ) [78], with 16 items measuring *Biospheric values* (4 items), *Altruistic values* (5 items), *Hedonic values* (3 items), and *Egoistic values* (5 items). The items were framed as a description of different people, and the respondents were asked to rate how much they resembled the person described. The general beliefs and norms assessed in the present study were *Individual responsibility* (single item), *Social norm* (4 items), and *Personal norm* (3 items). These items (general beliefs and norms) have been extensively used in earlier research e.g., [37,41]. Measure-specific beliefs in relation to the increased parking fees were assessed (single items for *Justice*, *Effectiveness*, and *Attitude*, e.g., [36,63]). Lastly, the expressed acceptability of the measure and the probability of behavioral change due to the parking fees were assessed using single items. In Table 2, the above-described items are presented, with means, standard deviations and Cronbach's alphas where applicable.

Table 2. Mean, standard deviation and Cronbach's alpha for items.

Index	Items	Mean (std.)	Mean (std) for Index	Reliability (Cronbach's α)
Values				
Altruistic E-PVQ [a]	It is important to [him/her] that every person have equal opportunities	4.79 (1.771)	5.31 (1.056)	0.73
	It is important to [him/her] to take care of those who are worse off	4.82 (1.518)		
	It is important to [him/her] that every person be treated justly	5.87 (1.329)		
	It is important to [him/her] that there be no war or conflict	5.38 (1.729)		
	It is important to [him/her] to be helpful to others	5.71 (1.189)		
Biospheric E-PVQ [a]	It is important to [him/her] to prevent environmental pollution	4.79 (1.571)	4.95 (1.177)	0.82
	It is important to [him/her] to protect the environment	5.03 (1.427)		
	It is important to [him/her] to respect nature	5.73 (1.305)		
	It is important to [him/her] to be in unity with nature	4.30 (1.516)		
Hedonic E-PVQ [a]	It is important to [him/her] to have fun	5.17 (1.376)	5.32 (1.110)	0.81
	It is important to [him/her] to enjoy life's pleasures	5.35 (1.345)		
	It is important to [him/her] to do things [he/she] enjoys	5.46 (1.194)		
Egoistic E-PVQ [a]	It is important to [him/her] to have control over others' actions	2.98 (1.432)	3.64 (0.943)	0.63
	It is important to [him/her] to have authority over others	2.23 (1.317)		
	It is important to [him/her] to be influential	3.63 (1.491)		
	It is important to [him/her] to have money and possessions	1.42 (1.448)		
	It is important to [him/her] to work hard and be ambitious	5.22 (1.436)		
	General beliefs and norms			
Individual responsibility [b]	To what degree are private citizens in Sweden responsible for taking action to decrease private car use?	5.01 (1.748)		-
Social norm [c]	Most people who are important to me are ok with high parking fees	2.70 (1.498)	2.41 (1.290)	0.84
	I think my friends expect me to favor high parking fees	2.64 (1.666)		
	People who are important to me usually express positive attitudes toward implementing high parking fees	2.24 (1.396)		
	People who are important to me usually express positive attitudes toward measures to decrease car use	3.36 (1.685)		
Personal norm [c]	Based on my values, it feels right to pay high parking fees when I park	3.35 (1.844)	3.55 (1.626)	0.79
	Driving a car more than necessary gives me a bad conscience	3.89 (1.996)		
	I feel a moral obligation to reduce my car use	3.50 (1.974)		
	Measures specific beliefs			
Measure-spec. justice [d]	How fair do you think Anna thinks implementation of the increased parking fees is?	2.67 (1.457)		-
Measure-spec. effectiveness [e]	How effective do you think Anna thinks the increased parking fees are in improving the environment in the city?	3.33 (1.529)		-
Measure-spec. attitude [f]	How do you think Anna feels about the increased parking fees in the city?	2.36 (1.303)		-
	Acceptability and behavioral change			
Measure acceptability [g]	How inclined do you think Anna is to accept implementation of the increased parking fees?	3.03 (1.522)		-
Expected behavioral outcome [h]	How probable do you think it is that Anna will stop driving to and from work?	3.48 (1.552)		-

[a] Scale 1 = Totally not like you–7 = Totally like you; [b] Scale 1 = Very little responsibility–7 = Great responsibility; [c] Scale 1 = Not in agreement at all–7 = In total agreement; [d] Not fair at all–7 = Very fair; [e] Not effective at all–7 = Very effective; [f] Very negative–7 = Very positive; [g] Not likely to accept at all–7 = Very likely to accept; [h] 1 = Not at all likely–7 = Very likely.

3.2. Proposed Model of the Influence of Attitudinal Factors

In the present study, a proposed path model (see Figure 1) was tested in three groups receiving information about the parking fee measures framed in relation to a hedonic, gain or normative goal, and one group receiving only basic information (control group). The proposed model in Figure 1 is based on the theoretical frameworks of NAM and VBN and is deliberately kept strict, from a statistical perspective, in testing whether most of the influence of factors earlier in the hierarchy can be said to be indirect in that they go through personal norm (as stated in the norm activation process). There are probably other paths than those included in the proposed model, but the purpose of the model was foremost to test norm activation. The order of the variables in the proposed model is based on the previously presented NAM and VBN models [73,77]. The influence of values on acceptability of the measures in the study is foremost indirect, through general beliefs and norms (individual responsibility, social norm and personal norm) as well as measure-specific beliefs (justice, effectiveness, and attitude).

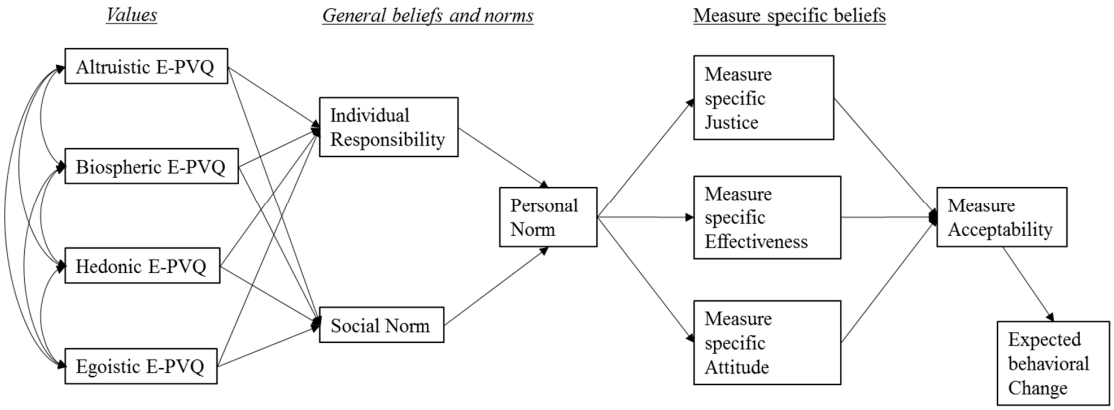

Figure 1. Proposed model of the influence of values, general beliefs and norms on measure-specific beliefs, acceptability of measures and expected behavioral change. The nested model comparison was estimated in four groups (gain goal frame, hedonic goal frame, norm goal frame and control) for a parking fee measure.

4. Results

4.1. The Respondents

A total of 2765 invitations were sent out, yielding 802 responses. This corresponds to a response rate of 29%. The characteristics of the respondents are presented in Table 3 and compared to the total Swedish population. The distribution of men and women among the respondents was similar to that of the population (50% of each sex), as was the share of respondents with a university degree. The lowest income group (less than 200,000 SEK, ≈ Euro 20,000) was under-represented among the respondents, as were residents in the larger cities with 100,000 or more inhabitants. However, no significant differences were noted between the four groups in the survey, supporting the validity of the sampling procedure.

Table 3. Characteristics of the respondents in the parking fee scenario (n = 802).

	Parking Fee Measure				Total Swedish Population
	Hedonic	**Gain**	**Normative**	**Control**	
Gender (Male)	52%	49%	49%	50%	50%
Education (University education > 2 years)	46%	42%	53%	44%	22%
Income (gross income 2017), 20- to 64-year-olds					
Less than 200,000 SEK (~20,000€)	22%	20%	18%	15%	31%
200,000–399,999 SEK (~20,000–39,999€)	41%	46%	40%	43%	40%
400,000–599,999 SEK(~40,000–59,999 €)	24%	22%	28%	22%	21%
600,000 SEK or more (~60,000– €)	8%	9%	9%	11%	7%
Size of place of residence (not municipality)					
Rural–2000 inhabitants	16%	18%	11%	9%	10%
2001–10,000 inhabitants	10%	8%	10%	7%	17%
10,001–50,000 inhabitants	12%	16%	12%	14%	17%
50,001–100,000 inhabitants	10%	7%	8%	9%	18%
100,001 or more	54%	57%	60%	61%	36%
Driver's license (Yes)	86%	87%	90%	84%	78% [2]
Number of cars in the household					
No car	21%	20%	23%	20%	-
1 car	52%	52%	46%	49%	-
2 cars	23%	19%	22%	22%	-
3 cars or more	5%	10%	9%	10%	-
Car dependency [1]					
No or very low car dependency (0, 1)	23%	22%	25%	21%	-
Moderate car dependency (2–6)	48%	43%	45%	51%	-
Very high car dependency (7)	30%	31%	30%	28%	-

[1] Assessed on an 8-point scale where 0 = no dependency, 1 = very low dependency, and 7 = very high dependency. [2] Data for 2013.

4.2. Attitudinal Factors and Framing

The aim of the present study was to investigate how framing of information influences the acceptance of a measure intended to reduce car travel. In the study, three groups received information (a sermon) about a parking fee measure (a stick) framed in relation to a hedonic, gain or normative goal. A fourth control group was included in the study. A first step in the analysis was to determine whether the manipulations (e.g., the different goal frames) were perceived correctly. In Table 4, the results of this manipulation check are presented, showing that participants in the gain goal frame group primarily perceived a focus on gain; those in the hedonic goal frame group, a focus on hedonic emotions; and those in the normative goal frame group, a focus on norms, at a significant level. Thus, the manipulations for the respective frames all seem to have worked.

Table 4. Means of perceived focus on the three goal frames (gain, hedonic, norm) in the experimental condition (parking fee measure).

	Increased Parking Fees		
Degree of focus on:	**Gain goal frame**	**Hedonic goal frame**	**Normative Goal Frame**
Hedonic emotions	**3.10** [1]	**4.14** [2]	**3.22** [1]
Gain	**3.65** [1]	**2.28** [2]	**2.12** [2]
Norms	**3.88** [1]	**4.30** [2]	**5.09** [3]

Assessments were made on a 7-point scale, where 1 = no focus, and 7 = Much focus. Different numerical indexes on mean values indicate significant group differences on a $p < 0.05$ level, while similar numerical indexes indicate non-significant group difference.

Respondents with different socio-demographic characteristics differed to some degree with respect to their values, general beliefs and norms, measure-specific beliefs (fairness and effectiveness), acceptability of increased parking fees, and expected behavioral change (see Table 5). Women stressed biospheric, altruistic and hedonic values more than men did, and women also perceived it to be a stronger social and personal norm in relation to the negative environmental effects of car use. Women also thought that Anna would find the measure fairer and more effective than men did, and women had a more positive attitude toward and higher level of acceptability for the parking measure than men did. There were also age differences. For example, young people (18–34 years) stressed egoistic values more than the other older age groups did, and the young group also thought the measure was fair and effective to a higher extent than the other two age groups did. Respondents in the metropolitan areas had a more positive attitude toward and higher acceptability for increased parking fees than respondents in other cities did, and to some degree found the measure to be fairer and more effective compared to respondents in other cities.

In the study, a number of attitudinal factors were assessed, and One-way ANOVAs were used to test whether the four groups differed in strength of the assessed values, general beliefs and norms, measure-specific beliefs, acceptability of the measure, and the expected behavioral outcome. In Table 6, mean values for the assessed attitudinal factors in the four groups (gain goal, hedonic goal, normative goal, and control group) are presented.

The results show that the four treatment groups did not differ significantly on values (E-PVQ) and norms, nor did they differ with respect to the expressed effectiveness of the parking measures and expected behavioral change of the fictive Anna. The groups did, however, differ significantly with respect to perceived fairness, attitude toward the parking measure, and expressed acceptability. With regard to fairness and attitude, members of the control group perceived the measure to be less fair and were less positive in their attitude toward the measure compared to the goal frame groups. The expressed acceptability was stronger in the group receiving a normative goal framed message as compared to the control group and the group receiving the message with a gain goal frame.

Table 5. Mean values for values, general beliefs and norms, measure-specific beliefs, acceptability of the measure, and the expected behavioral outcome among respondents with different socio-demographic characteristics.

	Sex		Age			City		Income	
	Men	**Women**	**18–34**	**35–49**	**50–75**	**Metro-politan**	**Other**	**<300 kkr**	**300 kkr–**
Values									
Biospheric (E-PVQ) [a]	4.81 ***	5.11	4.93	4.90	5.06	5.00	4.90	5.08 *	4.90
Altruistic (E-PVQ) [a]	5.08 ***	5.54	5.40	5.28	5.28	5.33	5.24	5.40	5.27
Hedonic (E-PVQ) [a]	5.14 **	5.50	5.46 *	5.31	5.21	5.37	5.24	5.31	5.34
Egoistic (E-PVQ) [a]	3.60	3.68	3.91 ***	3.59	3.45	3.68	3.57	3.46	3.76
General beliefs and norms									
Individual responsibility [ba]	4.69 ***	5.33	5.35 **	4.99	4.74	5.04	4.97	5.03	4.99
Social norm [c]	2.64 *	2.83	3.07 ***	2.62	2.58	2.80	2.62	2.77	2.71
Personal norm	3.23 **	3.85	3.93 ***	3.48	3.27	3.61	3.43	3.71 *	3.45
Measures specific beliefs									
Fairness [d]	2.51 **	2.83	3.03 ***	2.63	2.41	2.78 *	2.49	2.74	2.60
Effectiveness [e]	3.07 ***	3.58	3.66 ***	3.31	3.06	3.43 *	3.15	3.49 **	3.20
Attitude [f]	2.19 ***	2.53	2.73 ***	2.32	2.08	2.48 ***	2.15	2.44	2.26
Acceptability and behavioral change									
Acceptability [g]	2.84 **	3.21	3.28 **	3.06	2.77	3.15 **	2.82	3.12	2.95
Expected behavioral change [h]	3.38	3.57	3.73 **	3.47	3.26	3.63	3.36	3.63 ***	3.20

* = $p < 0.05$, ** = $p < 0.01$ and *** = $p < 0.001$. Assessments were made on a 7-point scale, [a] Scale 1 = Totally not like you–7 = Totally like you; [b] Scale 1 = Very little responsibility–7 = Great responsibility; [c] Scale 1 = Not in agreement at all–7 = In total agreement; [d] Not fair at all–7 = Very fair; [e] Not effective at all–7 = Very effective; [f] Very negative–7 = Very positive; [g] Not likely to accept at all–7 = Very likely to accept; [h] 1 = Not at all likely–7 = Very likely.

Table 6. Mean values for values, general beliefs and norms, measure-specific beliefs, acceptability of the measure, and the expected behavioral outcome.

	Hedonic	Gain	Norm	Control	F-value
Altruistic (E-PVQ) [a]	5.21	5.27	5.34	5.44	0.16
Biospheric (E-PVQ) [a]	4.92	4.96	5.07	4.91	0.84
Hedonic (E-PVQ) [a]	5.29	5.35	5.28	5.37	0.33
Egoistic (E-PVQ) [a]	3.53	3.72	3.66	3.66	1.39
Individual responsibility [ba]	5.07	4.93	5.05	5.00	0.24
Social norm [c]	2.80	2.79	2.80	2.56	1.61
Personal norm [c]	3.49	3.57	3.69	3.45	0.87
Fairness [d]	2.90 $_{a*}$	2.69 $_{a*}$	2.93 $_{a*}$	2.19 $_{b*}$	11.38 ***
Effectiveness [e]	3.51	3.29	3.36	3.14	2.00
Attitude [f]	2.62 $_{a*}$	2.32 $_{a*}$	2.64 $_{a*}$	1.87 $_{b*}$	16.26 ***
Acceptability [g]	3.08 $_{a*}$	2.92 $_{a*,b*}$	3.40 $_{b*}$	2.72 $_{a*}$	7.30 ***
Expected behavioral change [h]	3.42	3.35	3.57	3.57	1.07

$_{a*, b*, c*}$ indicate significant group difference. F-values are indicated as significant at $p < 0.05$ (*), $p < 0.01$ (**), and $p < 0.001$ (***). Assessments were made on a 7-point scale, [a] Scale 1 = Totally not like you–7 = Totally like you; [b] Scale 1 = Very little responsibility–7 = Great responsibility; [c] Scale 1 = Not in agreement at all–7 = In total agreement; [d] Not fair at all–7 = Very fair; [e] Not effective at all–7 = Very effective; [f] Very negative–7 = Very positive; [g] Not likely to accept at all–7 = Very likely to accept; [h] 1 = Not at all likely–7 = Very likely.

4.3. Estimated Model of Norm Activation in Relation to Measure-Specific Beliefs

The proposed path model (see Figure 1) of norm activation states that general values and beliefs influence more measure-specific beliefs, such as perceived justice, effectiveness and attitude, and in a hierarchical manner, the degree of acceptability of the parking fee measure. To test the proposed path model on three groups receiving information about the parking fee measures framed in relation to a hedonic, gain or normative goal, with one group (control group) receiving only basic information, a Multiple-group Analysis was estimated using IBM software Amos 25 [79] (see Figure 2 a–d).

The Multiple-group Analysis (nested model comparison) showed that the structural weights (e.g., path coefficients) in the four groups differed significantly (CMIN = 117.69, df = 51, $p < 0.001$, GFI = 0.78, RMSEA = 0.089). Each path was then constrained respectively in the model. The results showed significant group differences in the influence from egoistic environmental values to social norm (CMIN = 11.76, df = 3, $p = 0.008$), from social norm to personal norm (CMIN = 8.53, df = 3, $p = 0.036$) and to measure-specific attitude (CMIN = 7.53, df = 3, $p = 0.057$), as well as from acceptability of the measure to expected behavioral change (CMIN = 44.82, df = 3, p > 0.001). Constraining all structural weights in the model, except the above-mentioned weights, showed clearly that other group differences were not present (CMIN = 49.77, df = 39, $p < 0.116$). RMSEA was similar for both the unconstrained model (RMSEA = 0.089 [LO 90 = 0.084, HI 90 = 0.094]) and the partly constrained model (RMSEA = 0.081 [LO90 = 0.076, HI90 = 0.085]), indicating that the overall model fits approximately in all groups, with some group differences present. Taken together, the results concerning group differences indicate that an influence of egoistic E-PVQ on social norm is significant and positive in the gain goal frame group, but not significant in any of the other groups, and that the influence of the social norm on the personal norm is weakest in the normative goal frame group and strongest in the hedonic goal frame and control group. The influence of personal norm on the attitude toward the parking fee measure was stronger in the normative and hedonic goal frame groups. In addition, the influence of acceptability of the measure on expected behavioral change was found to be weak and negative in the control group as compared to positive in the gain, hedonic and normative goal frame groups.

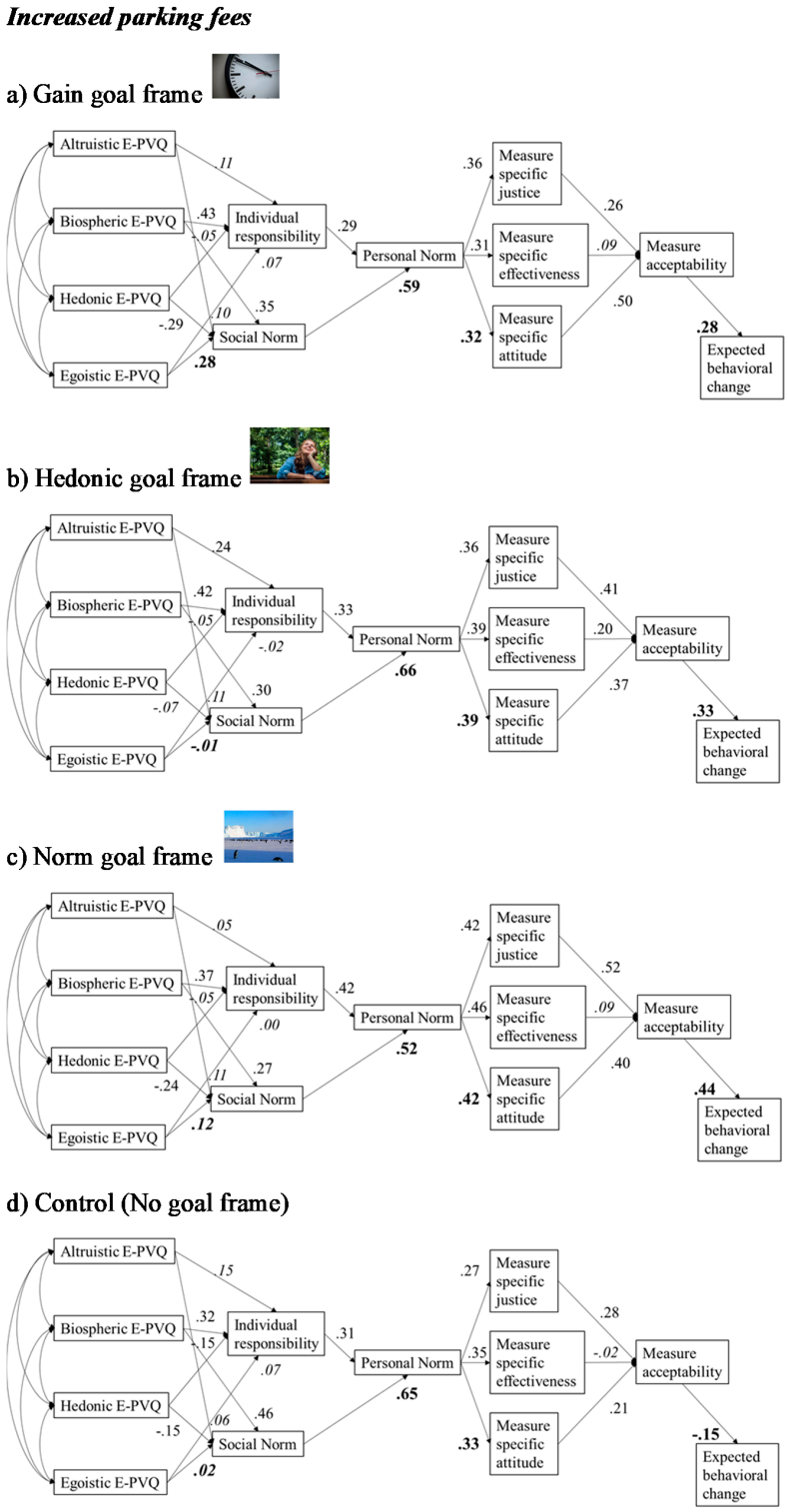

Figure 2. (**a**–**d**) Compilation of Multiple-group Analysis (nested group comparison) on the measure of increased parking fees (unconstrained model) with path coefficients for the influence of values, general beliefs, norms, and measure-specific beliefs on degree of acceptability for increased parking fees in the three goal frames ((**a**)—Gain, (**b**)—Hedonic, (**c**)—Norm) and one control frame (**d**). Significant group differences are written in boldface type, and path coefficients and non-significant path coefficients are written in italics. (Software IMS SPSS Amos version 26).

In general, the analysis showed that it is foremost biospheric E-PVQ that influenced the perceived individual responsibility and the social norm, and these in turn (individual responsibility and social norm) influenced the personal norm in the expected positive direction. Personal norm showed the expected positive influence on measure-specific beliefs (justice, effectiveness, and attitude), and primarily justice and attitude beliefs influenced the degree of acceptability for the parking fee measure. Lastly, the degree of acceptability influenced the expected behavioral change in the groups receiving a goal framed message in relation to the parking fee measure.

5. Conclusions

Overall, the results show that differently framed messages have an influence on perception of the fairness, justice and effectiveness associated with the environmental policy, and that the messages were more effective as a means to generate acceptance of the policy compared to no communication at all (control group). When presented with a scenario of increased parking fees due to poor air quality, the respondents had slightly negative measure-specific beliefs. Women, young people, and respondents in metropolitan areas made significantly higher (that is, less negative) assessments than men, elderly, and non-metropolitan residents did, respectively. Women also scored higher on biospheric, altruistic and hedonic values than did their counterparts, and women perceived decreasing car traffic to be a stronger social and personal norm. These gender differences in values are in line with other studies in the environmentalism area [80], and the present contribution is showing that these differences persist, even in a parking fee context. Further, the positive association between biospheric and altruistic values, on the one hand, and pro-environmental acts such as favoring increased parking fees, on the other, is in line with the findings of, e.g., Steg et al. [19]. Respondents in metropolitan areas (the cities of Stockholm, Gothenburg and Malmö) had a more positive attitude toward the fees and reported higher acceptability and behavioral change, compared to respondents in other cities. The more positive attitude toward parking fees among respondents in the metropolitan areas is not surprising, as they have experience of congestion, poor air quality due to exhaust fumes, and problems of finding parking, as pointed out in previous research [15,20,81]. As such, the present study, using an experimental method with randomized groups, adds to the literature showing that differently framed messages can have effects on how a given policy is perceived. This represents a step further than measuring policy attitudes using survey methodologies alone. As the importance of policy communication in influencing both policy acceptance and support has been emphasized more and more in the recent literature [22,82], this is an important addition. Concerning parking policies, the study contributes by informing policymakers both of the importance of communicating the reasons underlying the policies to the public and of different ways to do this, which has not been the focus of previous research in the parking policy literature [15,20].

Does framing a policy matter?

In general, the path analysis confirms that values, beliefs and norms are important antecedents to the acceptability of a transportation-related policy, which has been shown in numerous studies e.g., [35,36,45,47,61,63,64,72,73,83]. In relation to the different goal frames, some interesting results were revealed in the present study. For example, egoistic values were made salient in the gain goal frame group, only having a significant influence in that group. The influence of social norms was weak in the normative goal frame group, but relatively strong in the hedonic and control group. On the other hand, the influence of personal norm was stronger in the normative and hedonic goal frame groups. This speaks to the differences between internal motivation (personal norm), made salient in the normative goal frame group, and external motivation (social norm), made salient in the hedonic group. Lastly, the degree of acceptability influenced the expected behavioral change, in the groups receiving a goal framed message in relation to the parking fee measure. This indicates that framing a message, or a stick, in terms of gain, hedonic affect, and normative implications has an effect that could potentially lead to reduced private car use; this in comparison to a policy implemented without any framing.

Sustainability policies and messages can, and should, be carefully designed by policymakers so that they can offer acceptable and realistic alternatives that are also implementable [2,22,84]. The aim of implementing an increased parking fee, a stick, is to reduce car traffic and the need for parking space in cities where the competition for land is great. However, to be successful, car users have to accept the measure and change their behavior. The present study shows that framing can play a role in achieving this end.

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