Climate Change Concerns and Car Driving Habits Among Norwegian Commuters

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Introduction

Few studies have investigated the impact of climate beliefs on important everyday behavioral choices, such as travel mode. Especially, there is a lack of studies combining approaches from different disciplines. We develop an integrated institutionalist and social-psychological framework and apply it to a study of determinants of using a traditional internal combustion-engine vehicle (ICV) for commuting.

Method

The data come from a representative web-based survey with participants from Kantar's standing panel. Our analyses are based on responses from the 2607 members of the final sample of 4081 who were employed or enrolled in a school and responded to the question about the work/study commute.

Results

Possible antecedents that were significantly related to ICV use were included in SEM analyses. Behavior-specific beliefs, social norms, and habits as well as car ownership were treated as endogeneous. Variables not specific to ICV use were modeled as exogeneous. The final structural model is reported in Table 1.

The strongest direct antecedent of ICV use is habit, followed by ICV ownership. The main reason for the latter is probably that ownership increases availability, but ownership also mediates a number of favorable evaluations. Characteristics of the physical environment, including distances between residence and destinations such as work or study, and transport infrastructure, also influence the demand for private motorized transport, in addition to how favorably the ICV is perceived in terms of cost, speed, comfort, etc.

Table 1: Structural model of the use of an internal combustion engine car for commuting and its antecedents, N = 2607

Dependent variables		Independent variables	B	S.E.	β	C.R.	p	R^2	Total β_{ICV}
ICV use	<--	ICV is a habit	0.12	0.01	0.30	12.934	< .001	0.54	0.30
-	<--	Car ownership	0.09	0.01	0.17	10.008	< .001		0.17
-	<--	Convenient to walk	-0.04	0.01	-0.17	-8.277	< .001		-0.20
-	<--	ICV is cheap	0.07	0.01	0.15	6.128	< .001		0.18
-	<--	Speed & comfort beliefs	0.09	0.02	0.15	5.143	< .001		0.21

-	<--	ICV gives exercise	0.04	0.01	0.12	4.308	< .001		0.20
-	<--	Frequency PT departures[1]	0.02	0.00	0.11	5.256	< .001		0.21
-	<--	Age < 30	-0.10	0.02	-0.08	-4.792	< .001		-0.08
-	<--	Oslo-Akershus	-0.08	0.02	-0.07	-3.831	< .001		-0.14
-	<--	Need to switch PT during commute	0.07	0.02	0.07	3.620	< .001		0.07
-	<--	Environmental impact beliefs	-0.04	0.02	-0.06	-2.393	0.017		-0.06
ICV is a habit	<--	Social norms ICV use	0.78	0.06	0.66	13.514	< .001	0.31	0.25
-	<--	Frequency PT departures[1]	-0.07	0.02	-0.13	-3.671	< .001		
-	<--	Studying	0.40	0.13	0.11	2.983	0.003		-0.05
-	<--	Convenient to walk	0.06	0.02	0.10	3.018	0.003		
ICV ownership	<--	Social norms ICV use	0.26	0.03	0.28	8.382	< .001	0.25	
-	<--	Household size	0.20	0.01	0.26	14.612	< .001		0.03
-	<--	Frequency PT departures[1]	0.05	0.01	0.12	4.799	< .001		
-	<--	Climate change denial	0.12	0.02	0.12	5.292	< .001		0.09
-	<--	Self-enhancement	-0.07	0.03	-0.04	-1.969	0.049		-0.01
-	<--	Social attention, climate change[1]	-0.04	0.02	-0.04	-2.291	0.022		-0.01
ICV is cheap	<--	Climate change denial	0.20	0.04	0.15	4.947	< .001	0.05	
-	<--	Studying	-0.39	0.12	-0.11	-3.155	0.002		
-	<--	Oslo-Akershus	-0.21	0.08	-0.08	-2.707	0.007		
-	<--	Household size	-0.06	0.03	-0.06	-2.249	0.025		
Fast & comfortable	<--	Self-transcendence	-0.09	0.03	-0.12	-3.616	< .001	0.03	0.05
-	<--	Oslo-Akershus	-0.19	0.06	-0.10	-3.053	0.002		
ICV gives exercise	<--	Frequency PT departures[1]	0.19	0.02	0.33	9.476	< .001	0.14	
-	<--	Climate change denial	0.21	0.04	0.14	4.999	< .001		
-	<--	Studying	-0.34	0.13	-0.08	-2.581	0.010		
-	<--	Distance to public transport	-0.04	0.02	-0.06	-2.122	0.034		-0.01
Environmental impact beliefs	<--	Personal norms climate change	0.34	0.05	0.45	6.914	< .001	0.38	-0.03
-	<--	Climate change denial	-0.19	0.04	-0.26	-4.755	< .001		
-	<--	Self-transcendence	-0.09	0.03	-0.15	-2.984	0.003		
-	<--	Convenient to walk	0.04	0.01	0.14	4.449	< .001		
-	<--	Self-enhancement	0.12	0.04	-0.12	3.409	< .001		
Social norms ICV use	<--	ICV gives exercise	0.23	0.03	0.30	8.809	< .001	0.65	
-	<--	Frequency PT departures[1]	0.11	0.02	0.25	6.920	< .001		
-	<--	Fast & comfortable	0.30	0.05	0.24	6.170	< .001		
-	<--	Convenient to walk	-0.10	0.02	-0.20	-6.138	< .001		

-	<--	Studying	-0.55	0.11	-0.17	-4.949	< .001
-	<--	Oslo-Akershus	-0.33	0.07	-0.14	-4.812	< .001
-	<--	Self-transcendence	-0.12	0.03	-0.12	-4.321	< .001
-	<--	ICV is cheap	0.11	0.03	0.12	4.362	< .001
-	<--	Self-enhancement	0.14	0.05	0.08	2.560	0.010

Note: Only the structural model. Model fit: Chi-square = 2200.757, 598 df., $p < .001$. TLI = .92, CFI = .95, RMSEA = .032 (CI_{10} = .031 - .034). [1] Lower number = more frequent.

The strongest predictor of habitual ICV use is supportive social norms. Apparently, when people do what they perceive everybody else to be doing, they are less likely to reflect on their behavior. Supportive social norms are also the strongest predictors of ICV ownership, closely followed by household size. Social norms only affect ICV use indirectly. They are reinforced by favorable beliefs about ICV use and strongly rooted in physical context factors and in value priorities.

Discussion

Climate beliefs only have weak effects on the choice of travel mode in Norway. ICV use is primarily determined by car ownership, physical infrastructure and dominant institutions supporting this behavior. Many effects are mediated through beliefs favoring ICV use. However, the strongest effects on ICV use are from supportive habits and social norms, reflecting a long process of integrating ICV use in people's lives as a part of normal everyday behavior that is rarely questioned. The use of a conventional ICV for commuting has been institutionalized over a long time in Norway as in other developed economies. This makes this behavior difficult to change. We conclude with reflections on how to start the process of change towards climate-friendly commuting behavior.

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