OULUN YLIOPISTO
UNIVERSITY of OULU

WINTER CYCLING OF UNIVERSITY STUDENTS AND PERSONNEL: ATTITUDINAL AND NON-ATTITUDINAL ANTECEDENTS

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With this survey study we explore the university **personnel's and students'** bicycle use and motives especially when it comes to commuting between home and the university (Linnanmaa campus or other unit of work/study).

RESPONDENTS

- affiliation
  - student 568
  - staff/faculty 253
- gender
  - female 303
  - male 548
- age
  - average 32.9 years (std. 11.1)
- distance to university
  - average 4.6 km (std. 4.4 km)

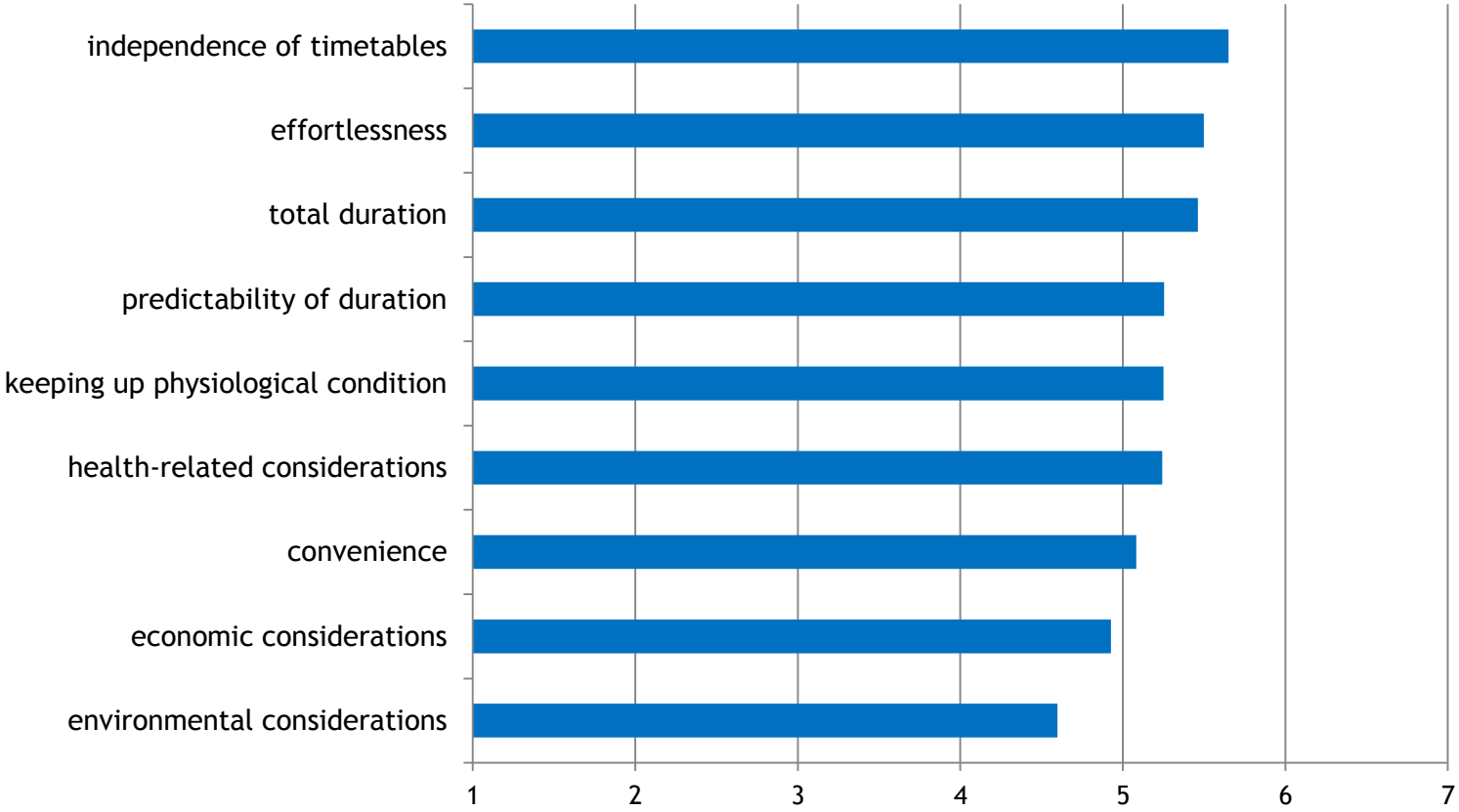
HOW OFTEN, ON AVERAGE, DO YOU USE THE FOLLOWING MEANS OF COMMUTING BETWEEN HOME AND THE UNIVERSITY?

Winter (Nov-April)	At least 3 times per week	1-2 times per week	Occasionally	Never
Walk	169	67	215	359
Bike	403	116	168	154
Bus	117	50	191	437
Car	117	61	289	352

Summer (May-Oct)	At least 3 times per week	1-2 times per week	Occasionally	Never
Walk	100	65	280	358
Bike	605	88	94	64
Bus	30	23	193	542
Car	68	68	301	377

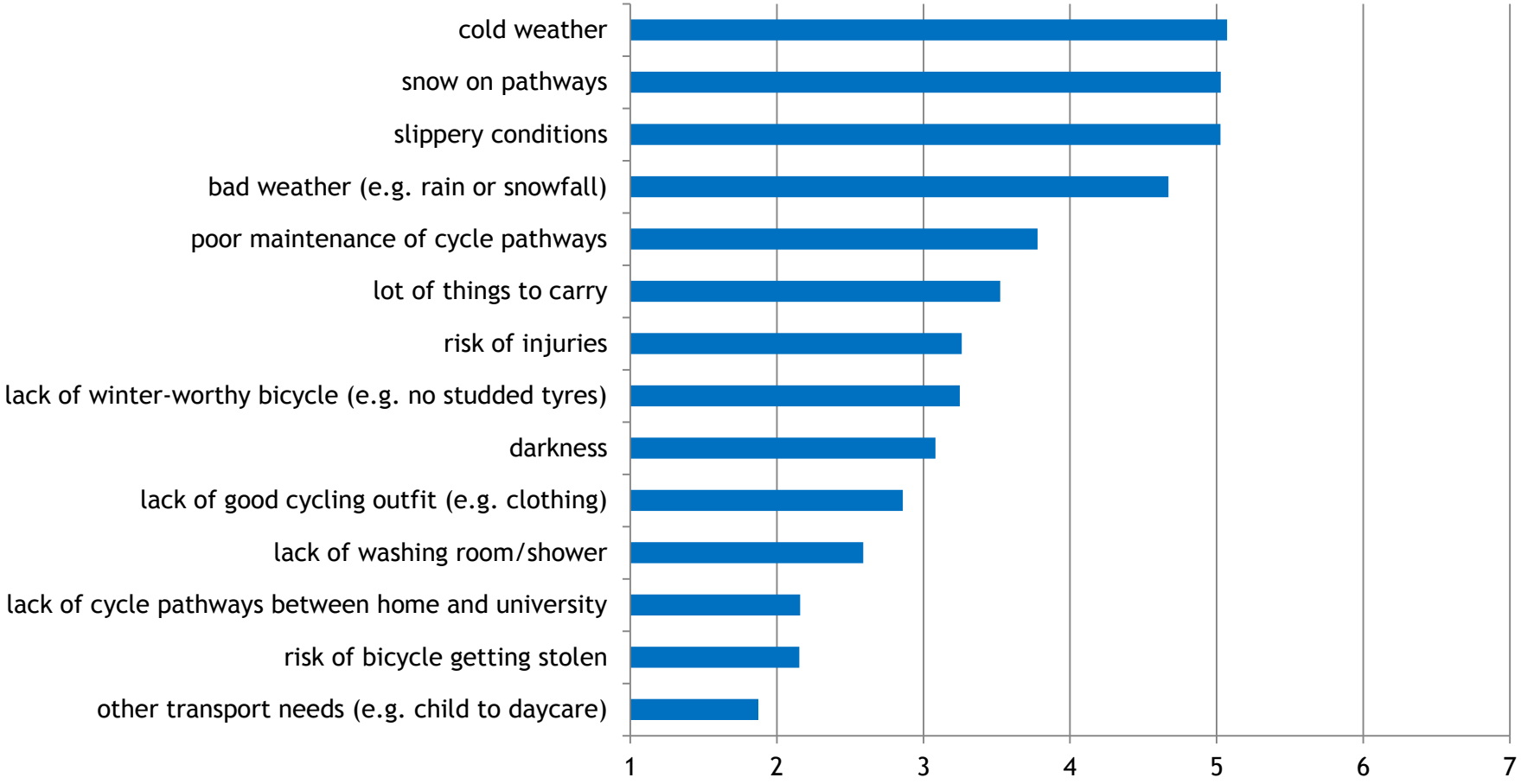
HOW WOULD YOU DESCRIBE THE IMPACT OF THE FOLLOWING FACTORS ON CHOICE OF YOUR COMMUTING MODE BETWEEN HOME AND THE UNIVERSITY

Scale: 1 = no impact … 7 = very strong impact



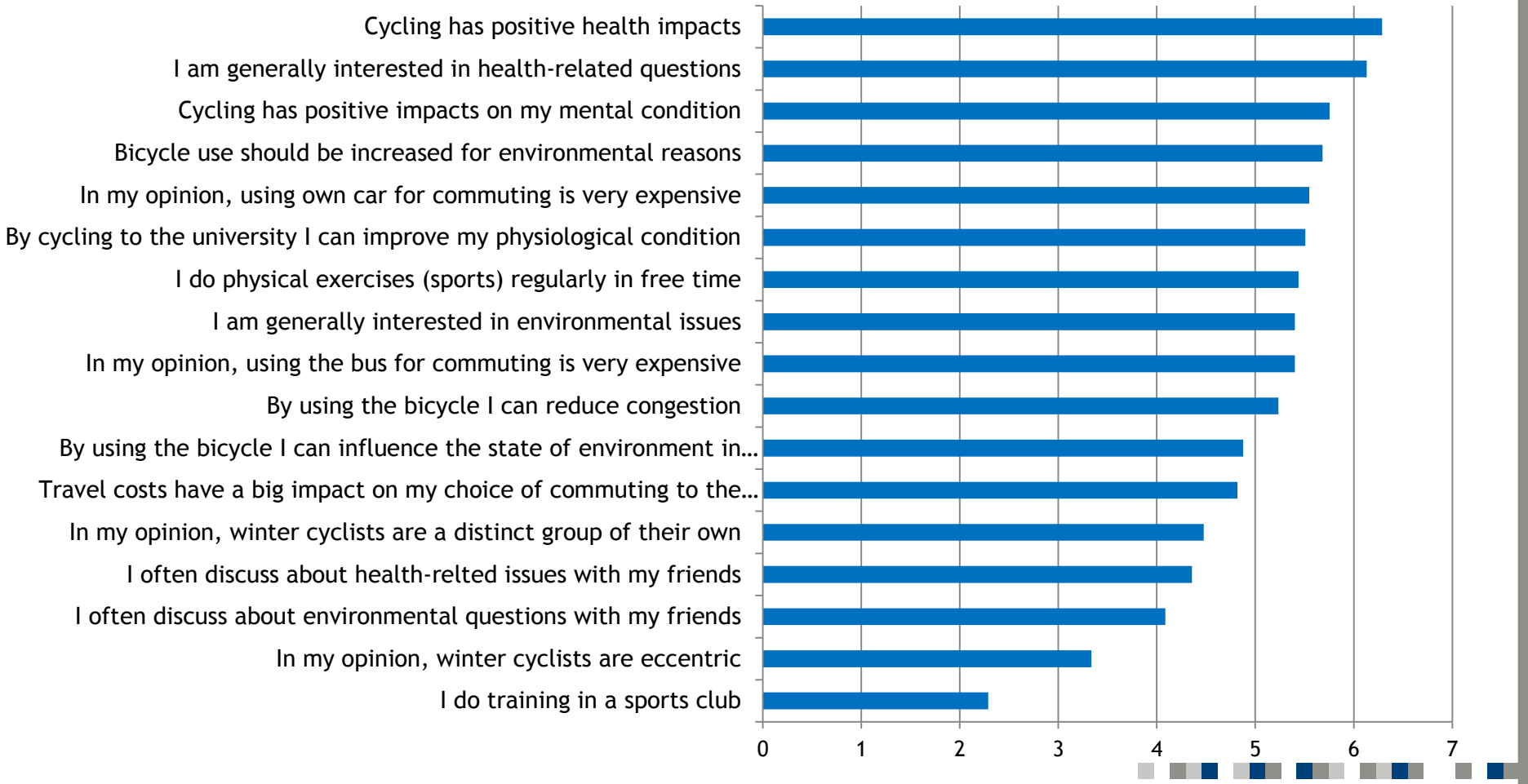
HOW WOULD YOU DESCRIBE THE IMPACT OF THE FOLLOWING FACTORS ON YOUR USE OF BICYCLE IN THE WINTER TIME

Scale: 1 = no impact … 7 = very strong impact



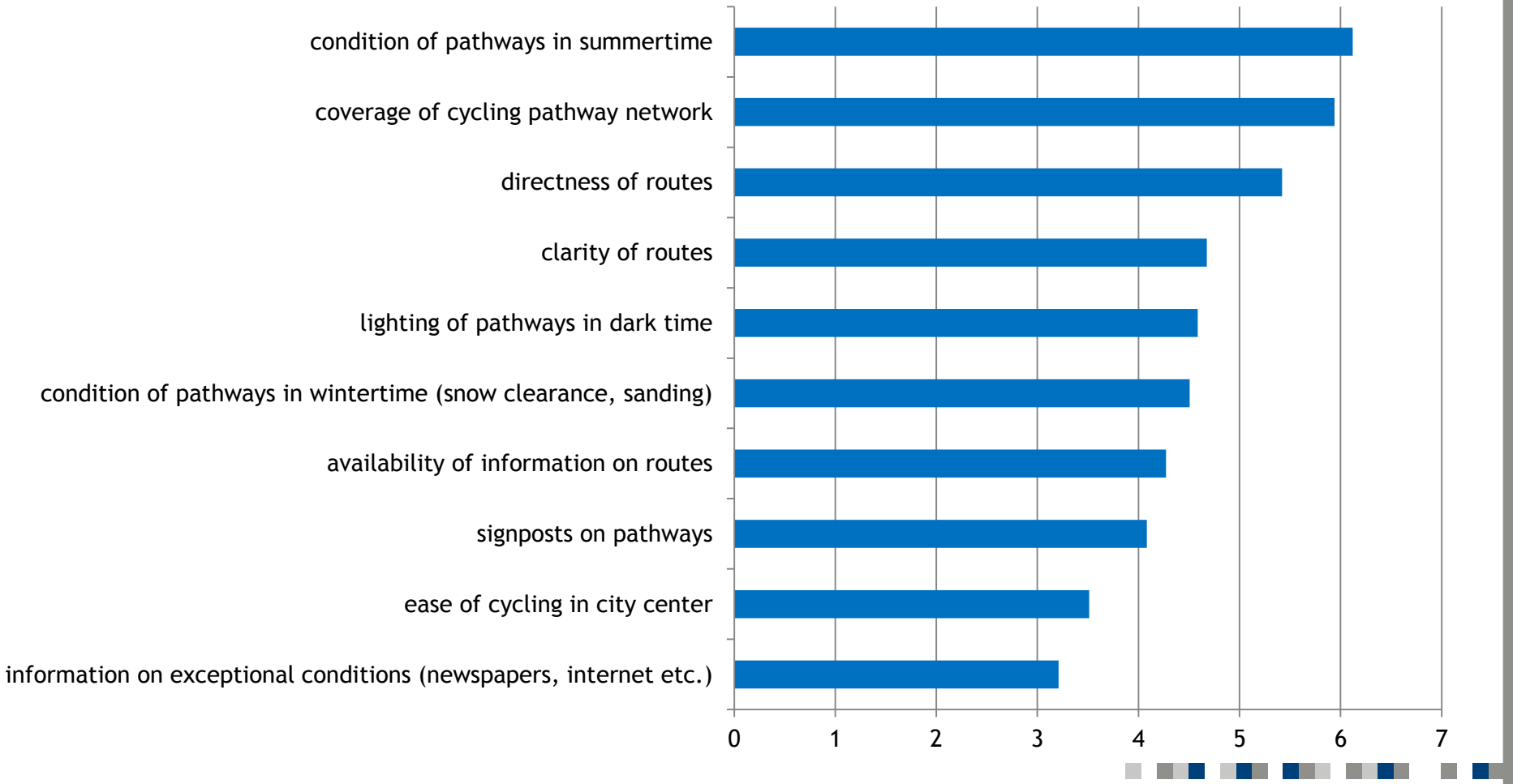
PLEASE ANSWER THE FOLLOWING ATTITUDINAL STATEMENTS RELATED TO CYCLING

Scale: 1 fully disagree … 7 = fully agree



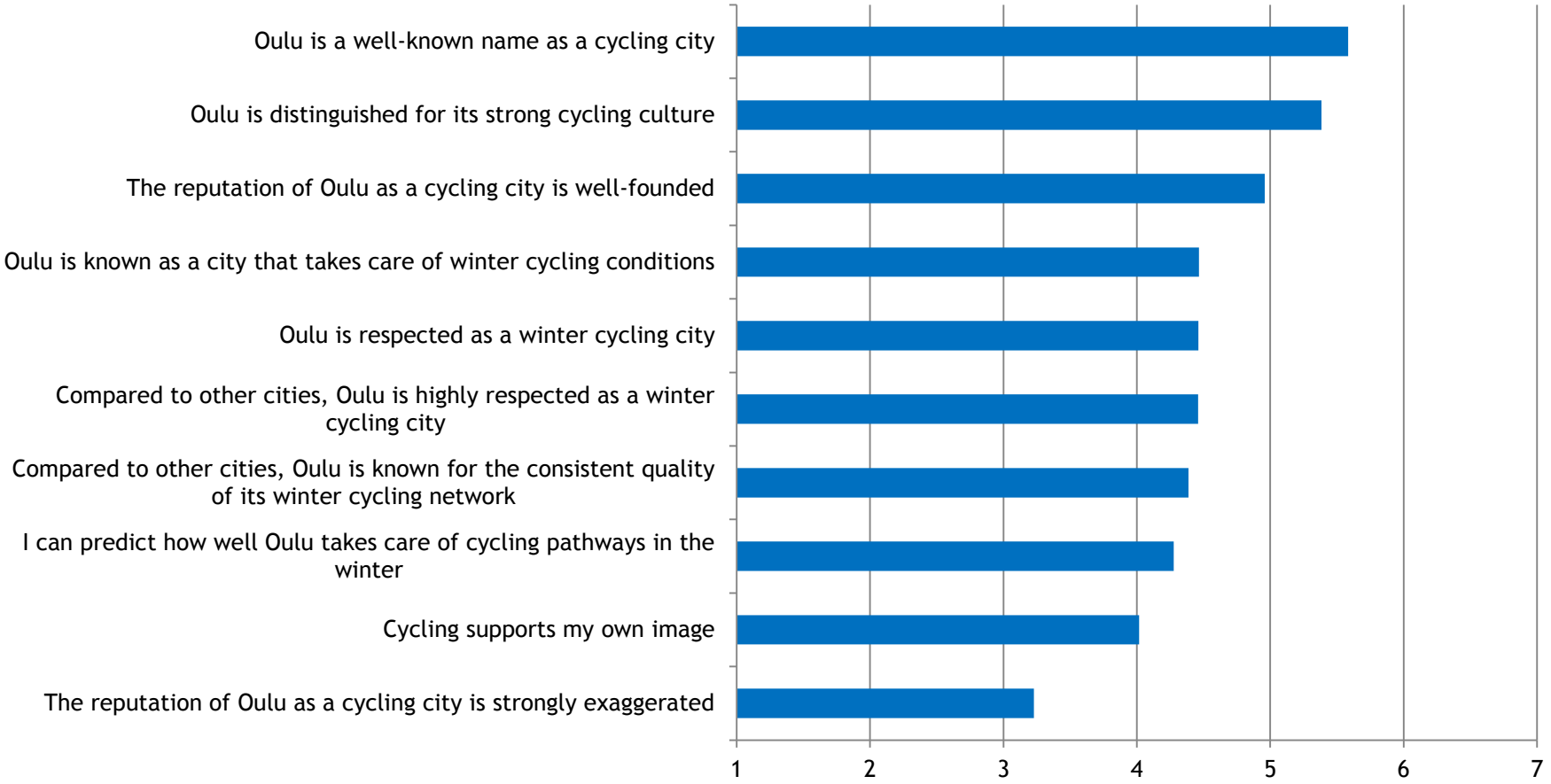
HOW WOULD YOU DESCRIBE THE CYCLING PATHWAYS IN OULU

Scale: 1 = poor … 7 = excellent



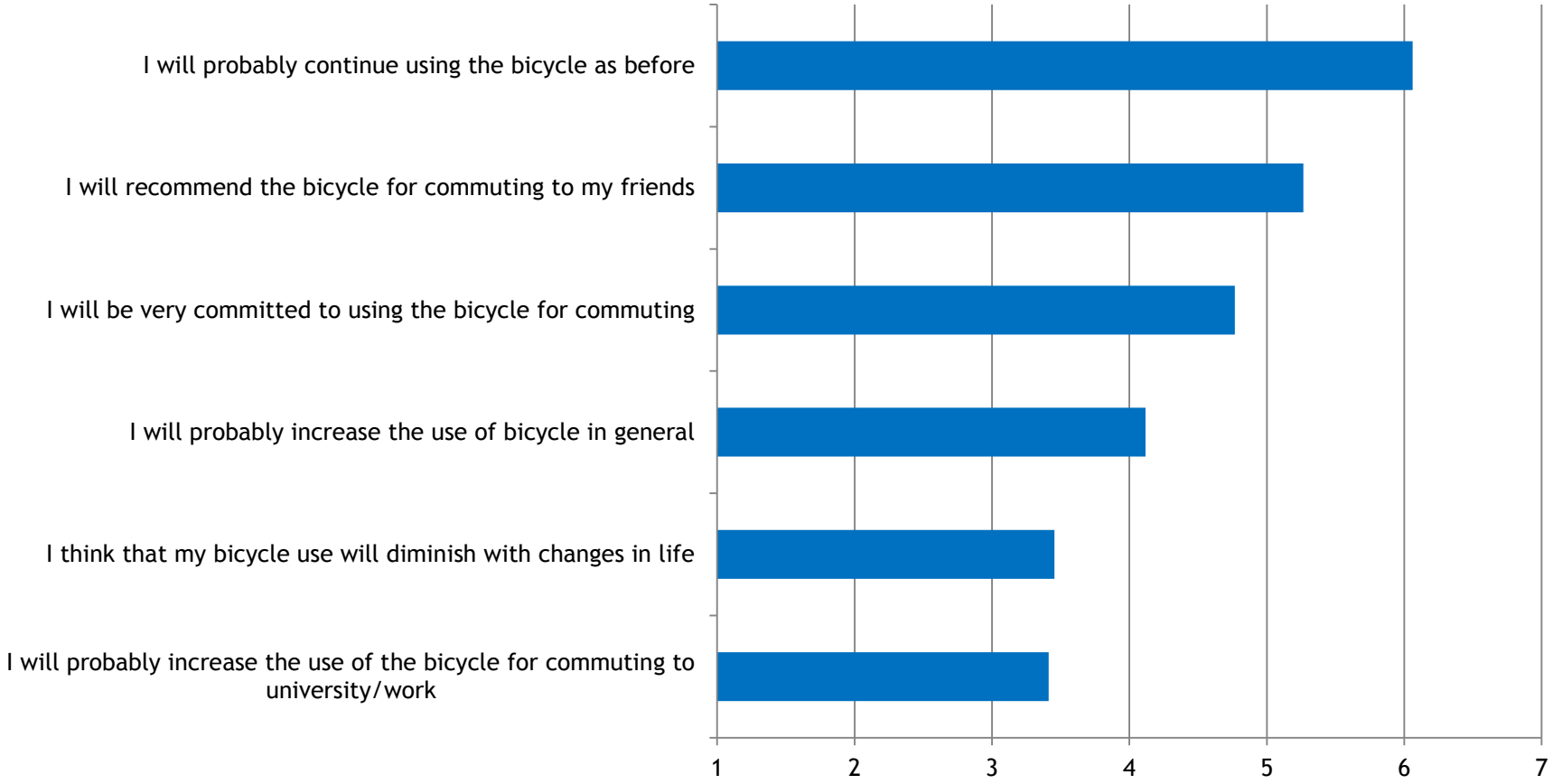
PLEASE GIVE YOUR OPINION ON OULU AS A CYCLING CITY

Scale: 1 fully disagree … 7 = fully agree



MY INTENTIONS REGARDING THE USE OF BICYCLE ON A TWO-THREE YEAR'S PERSPECTIVE ARE

Scale: 1 fully disagree … 7 = fully agree



CLUSTER ANALYSIS BASED ON COMMUTING MODES: 4 GROUPS ARE FOUND

Final Cluster Centers

		Cluster			
		1	2	3	4
winter	walkwin	4	3	**1**	4
	bikewin	3	**1**	3	3
	buswin	3	4	4	**1**
	carwin	**1**	3	4	3
	mcwin	4	4	4	4
summer	walksum	4	3	**2**	4
	bikesum	**2**	**1**	**2**	**2**
	bussum	4	4	4	3
	carsum	**2**	4	4	3
	mcsum	4	4	4	4

4 groups (clusters):

1) Car users (113)
2) Bikers (344)
3) Walkers (159)
4) Bus users (120)

Clusters are determined by the most frequent commuting mode in the winter.

Note: change of commuting behavior in the summer in three clusters; especially bike use increases (cluster center = 2, indicating use 1-2 times per week)

SOME FEATURES OF THE GROUPS

Demographics (average values)

	age	distance from university	temp. limit for biking
• 1 (car users)	38.7	9.4 km	-7.5°C
• 2 (bikers)	30.9	3.5 km	-19.1°C
• 3 (walkers)	28.6	1.5 km	-12.0°C
• 4 (bus users)	31.6	6.9 km	-8.2°C

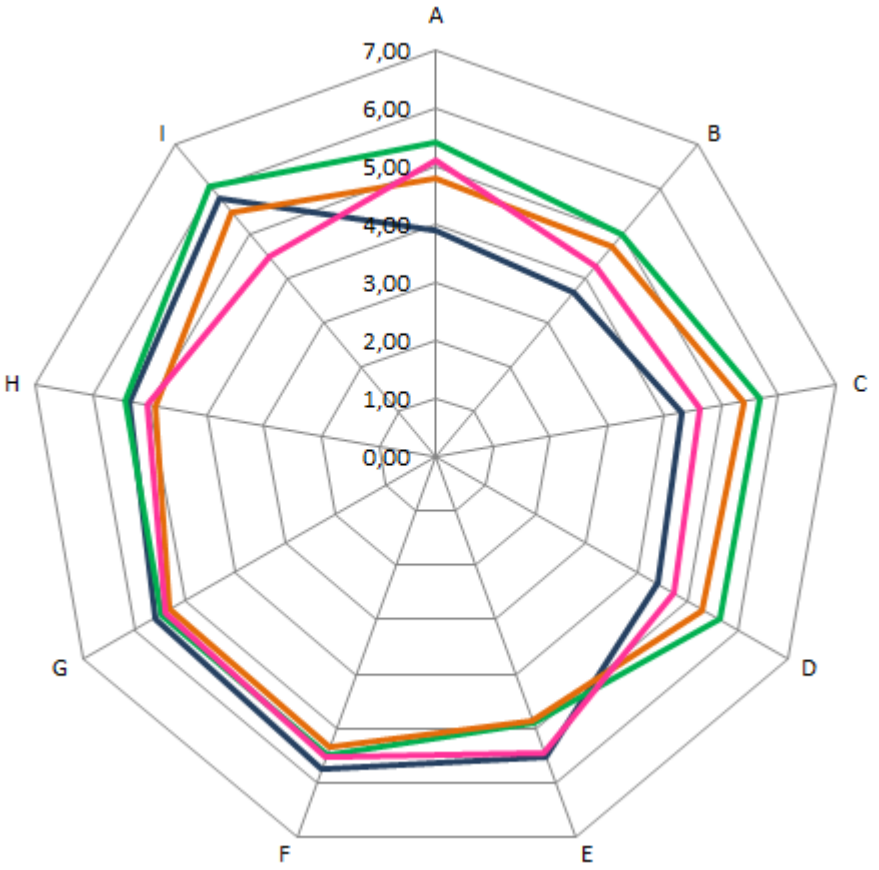
	students	personnel	total (N)
• 1 (car users)	40%	60%	100% (113)
• 2 (bikers)	80%	20%	100% (344)
• 3 (walkers)	82%	18%	100% (159)
• 4 (bus users)	82%	18%	100% (120)

COMMUTER GROUPS VS. MODE SELECTION CRITERIA

Scale: 1 = no impact … 7 = very strong impact

Clusters (Gr1-4):

1) Car users
2) Bikers
3) Walkers
4) Bus users



Commuting mode selection criteria:

a) Economic considerations
b) Environmental considerations
c) Health-related considerations
d) Keeping up physiological condition
e) Convenience
f) Effortlessness
g) Total duration
h) Predictability of duration
i) Independence of timetables

FACTOR ANALYSIS:
PHYSICAL (NON-ATTITUDINAL) ANTECEDENTS

		F1	F2	F3	F4	F5	F6	F7	F8
F1 winter cycling conditions									
slippery pathways	F11	,815	,073	,015	-,030	,165	-,032	-,010	-,007
snow on pathways	F12	,820	,029	,048	,111	,119	-,035	,029	-,047
cold weather	F13	,822	-,097	,061	-,017	-,032	,067	,039	,032
darkness	F14	,647	-,040	,018	,020	,060	,294	-,081	,121
bad weather	F15	,800	-,035	,026	-,041	,047	,160	-,008	,003
accident risk	F16	,617	,074	-,061	-,089	,279	,201	-,081	,144
F5 general cycling conditions									
lack of cycle pathways	F51	,017	,025	,067	,037	,705	,279	,005	,041
poor maintenance of cycle pathways	F52	,371	,011	,165	,100	,613	,070	,072	-,106
lack of cycling outfit (e.g. clothes)	F53	,374	-,027	-,076	-,001	,621	,225	,032	,179
unsuitable bike	F54	,503	,040	-,157	-,077	,514	,133	-,039	,205
F6 other physical conditions									
things to carry	F61	,315	,068	-,016	-,012	,155	,542	,077	-,051
other transport needs	F62	-,021	,038	,065	-,087	,030	,764	-,062	-,014
lack of shower	F63	,176	-,027	,038	,108	,184	,684	-,031	,031
risk of bike getting stolen	F64	,177	-,055	-,074	,069	,303	,494	,167	,069

FACTOR ANALYSIS:
ATTITUDINAL ANTECEDENTS (1)

		F1	F2	F3	F4	F5	F6	F7	F8
F2 Environmental impacts									
inluence on environment	F21	,029	,788	,241	,003	,092	-,045	,030	,047
reduction of congestion	F22	-,034	,718	,255	,028	,115	,027	,029	-,010
improvement of environment	F23	-,084	,778	,219	-,014	,092	-,089	,104	,022
environmental interest	F24	,008	,829	,093	,072	-,096	,053	,038	,031
talk about environment	F25	,059	,740	-,071	,175	-,152	,075	,038	,054
F3 Cycling health impacts									
physical condition	F31	,070	,104	,771	-,006	,049	,061	,038	,108
health impacts	F32	,067	,329	,745	,140	-,027	-,024	,087	-,006
mental condition	F33	-,061	,260	,751	,181	,038	,012	,026	,068
F4 General health interest									
health interest	F41	,029	,208	,435	,648	-,091	,001	,084	,056
physical training	F42	-,056	-,010	,190	,806	,008	-,074	,023	,049
excercise in sports club	F43	-,075	-,059	-,118	,634	,231	,035	-,048	-,067
talk about health	F44	,107	,333	,068	,655	-,115	,108	,063	,126

FACTOR ANALYSIS:
ATTITUDINAL ANTECEDENTS (2)

		F1	F2	F3	F4	F5	F6	F7	F8
F7 Economic interest									
cost of car use	F71	,057	,195	,006	,027	-,108	-,050	,721	,046
cost of bus use	F72	-,054	-,006	,028	,019	-,018	,171	,726	-,065
cost impact	F73	-,067	,018	,119	,014	,239	-,093	,719	,121
F8 Identity									
cyclists as a group	F81	,067	,102	,121	,036	,040	,017	,068	,837
eccentricity	F82	,077	,014	,046	,059	,081	,000	,013	,857

ANTECEDENTS IN DIFFERENT GROUPS

clusters	1	2	3	4	sig	
F1	0.34	-0.48	0.48	0.65	***	winter cycling conditions
F2	-0.11	0.02	0.10	-0.12		general cycling conditions
F3	0.11	0.06	-0.28	-0.04	**	other physical conditions
F4	0.11	0.01	-0.10	-0.08		environmental impacts
F5	-0.01	-0.10	0.12	0.13		cycling health impacts
F6	0.68	-0.13	-0.15	-0.13	***	general health interest
F7	-0.45	0.26	0.15	-0.14	***	economic interest
F8	-0.06	-0.10	-0.03	0.26	*	identity

Clusters (1-4):

1) Car users
2) Bikers
3) Walkers
4) Bus users

CONCLUSIONS

- Unlike other commuter groups, bike users are not worried about winter cycling conditions.
- Environmental, health-related and economic considerations have a slightly stronger impact on the choice of commuting mode among bike users than among other commuter groups.
- Car users are generally concerned about health issues; however, health-related considerations do not seem to affect their commuting mode choice (unlike bike users and walkers).
- Car users are less concerned about the economic aspects of commutuing; for bike users, economic aspects do play a role in choice of commuting mode.

Thank you.