



NECTAR 2-3 Cluster meeting and CIVINET conference, May 17-19, Brno, Czech Republic

Existence, relatedness and personal growth as motivators to participation in the Danish bike-to-work campaign

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Faktory ovlivňující ochotu řidičů a cyklistů jezdit ve smíšené dopravě

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Mezinárodní výzkum, jehož cílem je zjistit ochotu motoristů sdílet silniční prostor s cyklisty v případě, že podél komunikace neexistuje samostatná cyklostezka.

Výsledky studie pomohou při budoucích rozhodnutích, pomohou k optimalizaci dopravní politiky a kampaní týkajících se cyklistiky a napoví, jaký je cyklistický potenciál v českých městech.

Chtěli bychom Vás požádat o pomoc s distribucí dotazníku mezi Vašimi kolegy a známými. Vaše pomoc nám pomůže získat co nejpřesnější obraz situace. Děkujeme Vám.

https://www.surveymonkey.net/r/Preview/?sm=SveKMv09UWFTV9EKbuek7BVUuiJALoycHHUDY_2FEs7tOwR7GTrNOJx9fAaGPhhofm

Link Vám zašleme emailem.



Seek first to understand, then to be understood

Understand people's needs to participate in bike-to-work campaigns

Motivate employees to voluntarily engage in bike-to-work programs

Provide attractive and effective campaigns

Promoting a shift from car-oriented travel towards sustainable active travel



Mental

- Higher life satisfaction
- Positive wellbeing
- Lower level of stress

Societal

- Reduction in CO2
- Social inclusion
- Higher activity participation

Health

- Higher likelihood of physical activity participation
- Improving cardio-vascular fitness
- Lower likelihood of having diabetes
- Lower cardiovascular risk





Observed factors

- Travel distance
- Traffic safety
- Socio-economic traits
- Urban form
- Cycling infrastructure
- Cycling facilities
- Active travel programs
- Travel demand management

Psychological factors

- Cycling self-efficacy
- Social norms (i.e., employer, employees)
- Percieved difficulties
- Percieved benefits
- Travel habits
- Cycling / car attitudes





Danish bike-to-work campaign

Facts and figures

- The program started in 1997 by the Danish Cyclist Federation
- 70,884 employees from 6,933 teams participated in 2014
- Producing 10 million cycling kilometers (820,000 cycling days)
- The 30-days campaign during the month of May
- Prize-winning team competition on cycling days and distance
- Employers pay the 7 Euro participation fee
- **Participants receive information on monetary savings, burnt calories, spared CO2 emissions and reduction of sick days**



- Need-based participation?

VI CYKLER TIL ARBEJDE

1. - 31. maj 2016

TILMELD

STATISTIK

LOG IND

NOMINER HOLDETS CYKELSTJERNER!

Sammen har vi nu

Afskaffet
4.461
sygedage

Forbrændt
78.869.832
kalorier

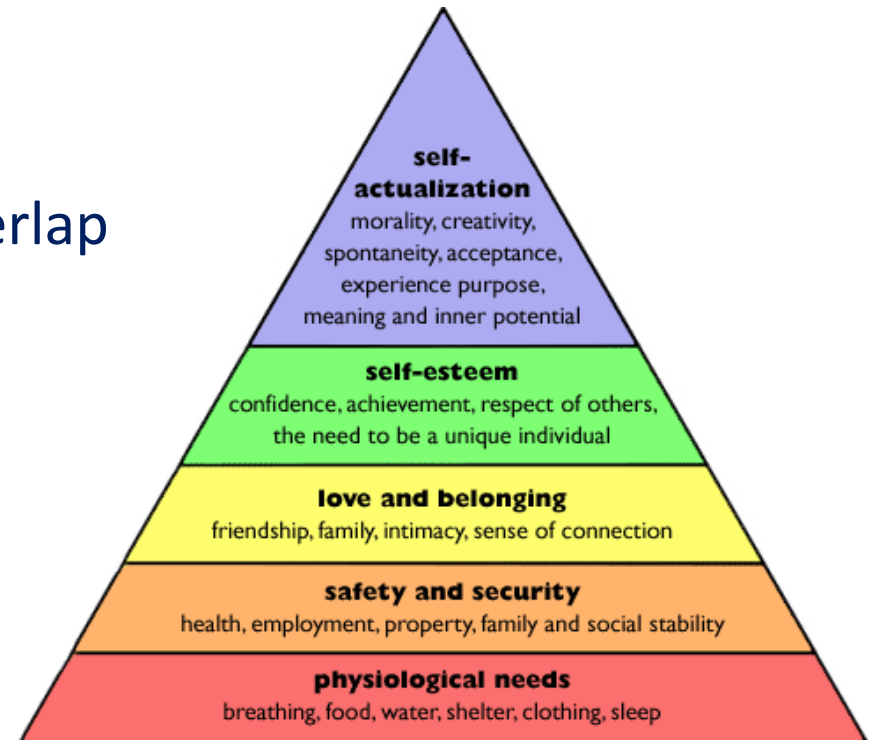
Skånet miljøet for
404.705
kg CO₂

Sparet
4.082.111
kroner

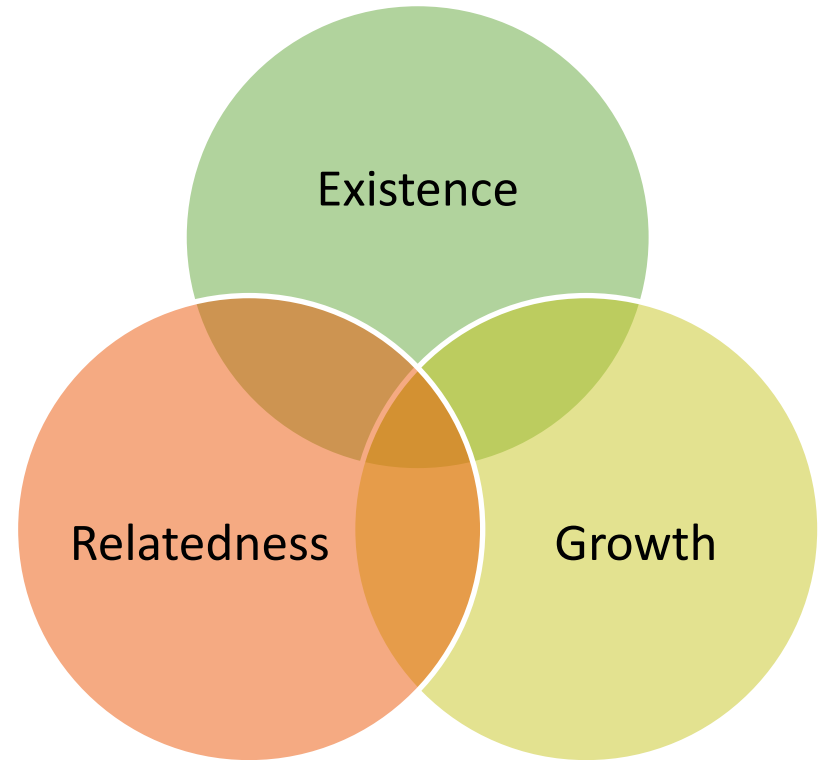


Behavioral framework

- **Maslow's (1954) hierarchy of needs**
- Lower-order needs are satisfied before high-order needs
- Independent needs without overlap
- No domain order reversal
- No trade-off across needs



- **Alderfer (1969) new theory of needs**
- Lower-order needs co-exist with high-order needs
- Possibility of need overlap
- Possibility for order reversal
- Possibility for trade-off across needs



Data collection

- Web-based survey among 10,000 Danish firms
- Focus-group based design
- Sponsored by Danish Cycling Federation and SUSTAIN project
- 2,057 complete responses (80.4% of survey entries)
- Incentive cost 440 Euros



Danmark cykler sammen

Engagement i "Vi Cykler Til Arbejde" kampagnen

* 5. Har din arbejdsplads deltaget i VCTA kampagnen?

- Ja, de deltager hvert år
- Ja, de har deltaget nogle få gange
- Nej, men de har planer om at deltage i 2016
- Nej, de har aldrig deltaget
- Ved ikke

* 6. Har du deltaget i VCTA kampagnen?

- Ja, jeg deltager altid
- Ja, jeg har deltaget nogle få gange
- Ja, jeg har deltaget en enkelt gang
- Nej, men jeg har planer om at deltage i 2016
- Nej, jeg har aldrig deltaget



*** 8. Hvordan vil du vurdere dit aktivitetsniveau under VCTA kampagnen?**

	Meget mere end normalt	Lidt mere end normalt	Det samme som normalt	Mindre end normalt	Har ikke prøvet at deltage
Antal dage cyklet i maj	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Antal km cyklet i maj	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Det var sjovere at cykle i maj	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
VCTA kampagnen giver mig en god anledning til at cykle til arbejde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 9. Har du benyttet nogle af funktionerne på VCTAs hjemmeside under kampagnen (flere svarmuligheder)?**

	Egen statistik	Egen gruppe	På tværs af grupper	Aldrig
Jeg har kigget på antal cykeldage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg har kigget på mængden af sparet CO2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg har kigget på antallet af kørte km	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg har kigget på antal forbrændte kalorier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg har kigget på antal sygedage sparet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg har kigget på besparelsen i DKK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*** 10. Hvilke udsagn har betydning for om du cykler til arbejde?**

	Meget uenig	Uenig	Hverken enig eller uenig	Enig	Meget enig
Jeg vil gerne i bedre fysisk form	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg forbinder det at cykle med en sundere livsstil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg får min daglige motion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg kan godt lide at cykle og få frisk luft	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg sparer penge ved at cykle til arbejde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Det er hurtigere for mig at cykle til arbejde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg bryder mig ikke om at være afhængig af offentlig transport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg er generelt i bedre humør, når jeg cykler til arbejde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



- ❖ The hypothesized behavioral model structure was investigated by applying a *structural equation model*

- Measurement equations relate the **factors to the indicators**

$$I_{rn} = Z_{ln}^* \alpha_r + v_{rn} \quad \text{and} \quad v_{rn} \square N(0, \Sigma_v) \quad \text{for } r = 1, \dots, R$$

- Structural equations relate the **factors to individual characteristics**

$$Z_{ln}^* = S_{ln} \beta_l + \omega_{ln} \quad \text{and} \quad \omega_{ln} \square N(0, \Sigma_\omega) \quad \text{for } l = 1, \dots, L$$

- Structural equations relate **the factors to bike to work participation frequency**

$$I_{in} = Z_{ln}^* \beta_z + S_{ln} \beta_s + \xi_{in} \quad \text{and} \quad \xi_{in} \square N(0, \Sigma_\xi) \quad \text{for } i = 1, \dots, I$$

- ❖ Goodness of fit: Comparative Fit Index (CFI) and the Root Mean Square of Approximation (RMSEA)



Factor analysis

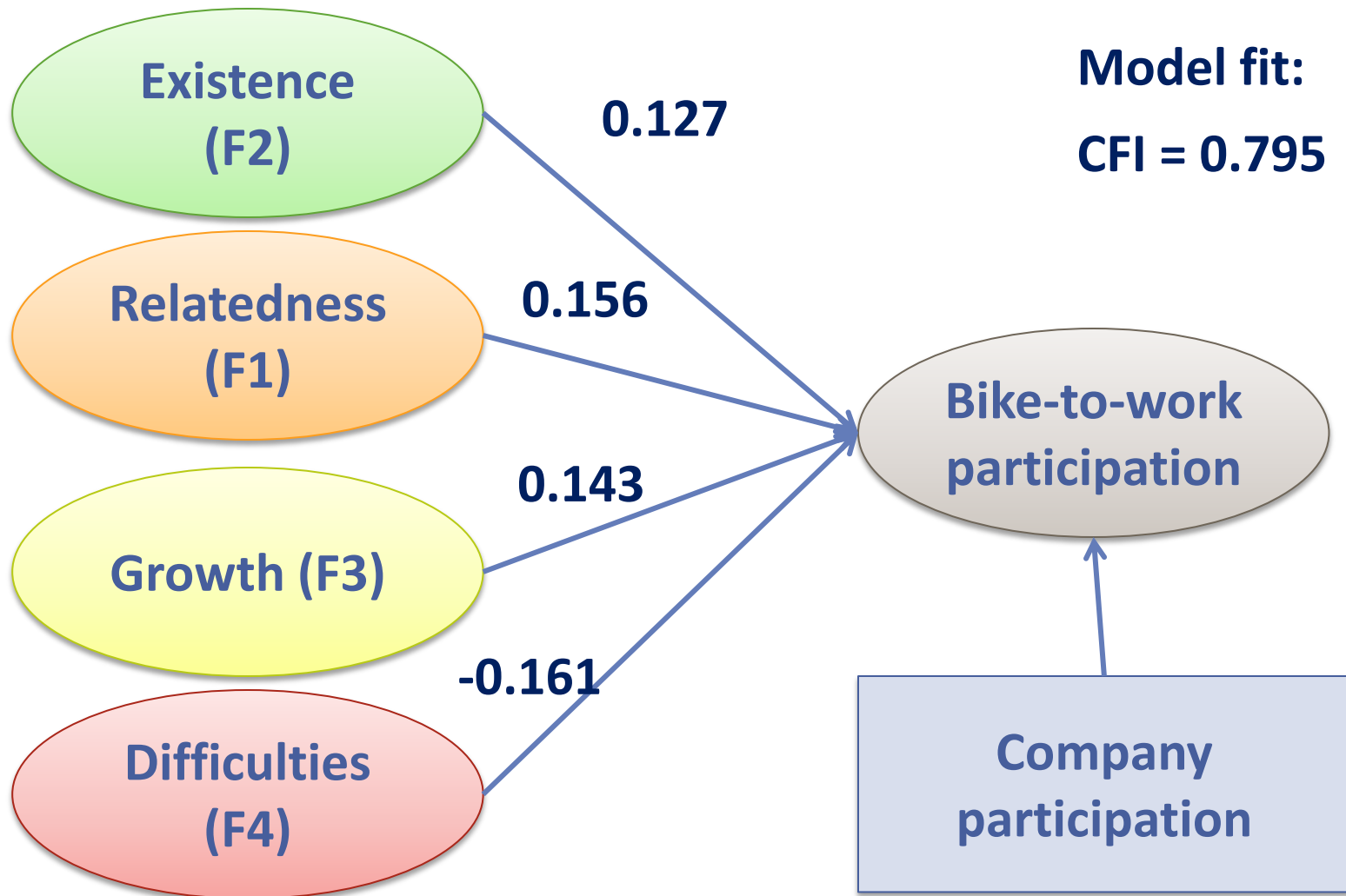
	Component			
	1	2	3	4
Translate				
I would like to improve my physical shape	.054	.793	.124	-.012
Jeg connect cycling with a more healthy lifestyle	.064	.836	.070	-.089
I get my daily exercise	.068	.785	-.002	-.054
I love to cycle and breathe fresh air	.043	.765	.010	-.126
I save money by taking the bike to work	.049	.424	.080	.055
I don't like to be dependent on public transport	.065	.318	.023	-.049
I am generally in a better mood when I bike to work	.115	.636	.065	-.143
I like the cohesiveness among the cyclist at my workplace	.678	.170	.273	-.045
Coworkers which are important for me, bike to work	.814	.074	.072	.049
Coworkers which are important for me, support me in taking the bike to	.798	.137	.136	.022
Coworkers which are important for me, expect me to bike to work	.778	.081	.102	.037
Most of my work colleagues bike to work	.423	-.069	-.019	.195
I think the mood is better at my workplace during bike-to-work campaign	.683	.048	.309	.065
I want to participate since most of my colleagues participate	.640	.010	.268	.075
I think it is good that we talk about the bike-to-work campaign	.623	.057	.412	.010
I think it is good to compete against other bike-to-work teams	.559	.062	.519	-.013

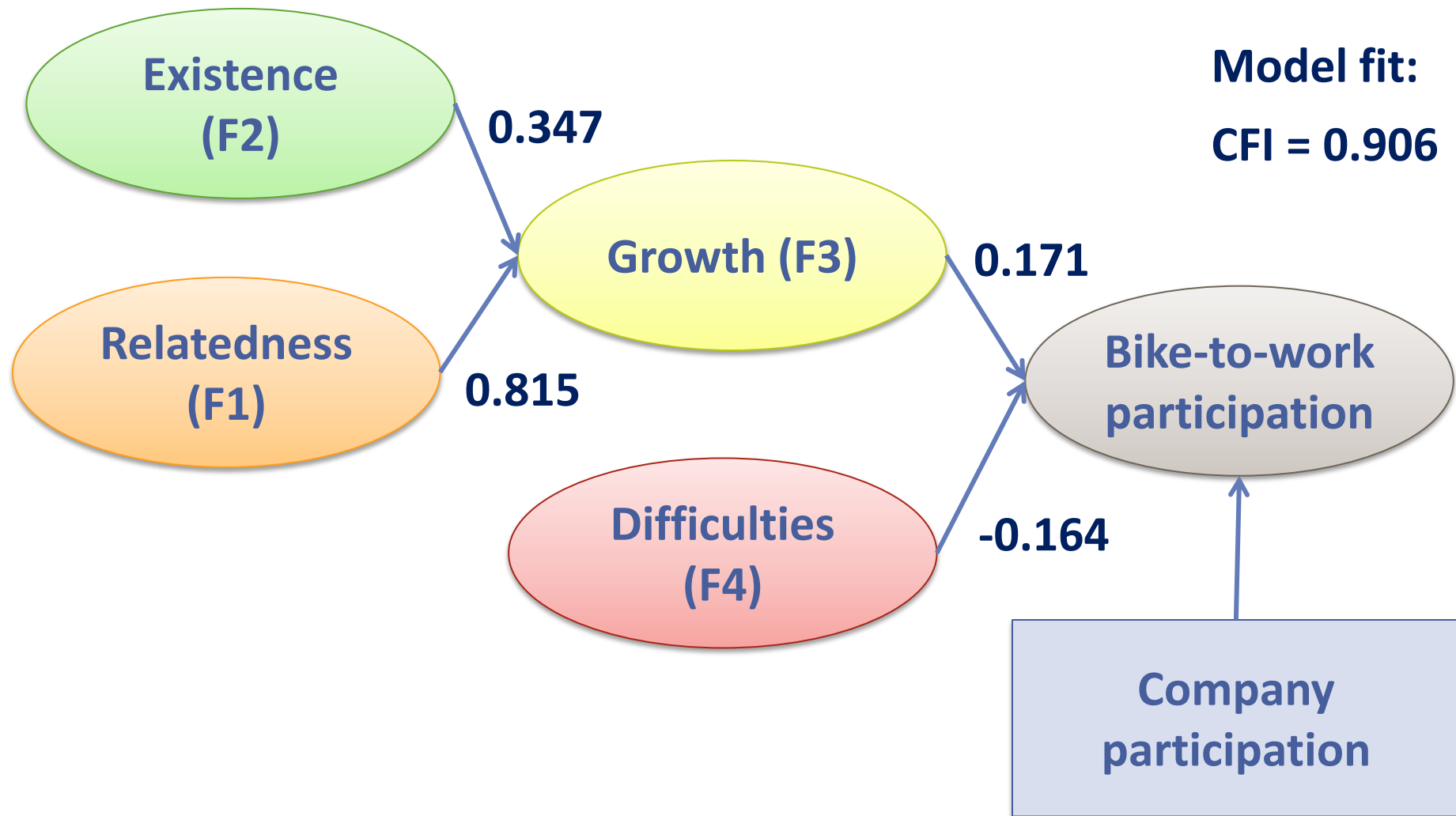


Factor analysis

I like to compete against my work colleagues	.231	.007	.806	.022
I like to challenge and be challenged by my work colleagues	.236	.042	.807	.022
I bike because I consider myself as green	.128	.428	.182	.060
I bike because I consider myself to be health conscious	.071	.591	.259	-.019
I bike because I consider myself as a dedicated cyclist	.100	.406	.248	-.010
I consider cycling to work during the campaign more as a sport activity	.274	.153	.648	.027
I cycle more and longer when I need to document my activity	.206	.120	.677	.050
I like to win some of the nice prizes in the bike-to-work campaign	.138	.171	.576	.039
My road to work is too difficult	.018	-.002	-.016	.588
Distance to work are too long	-.008	-.067	.026	.507
There are too many non-safe roads in my area	.033	.000	-.010	.616
There are too many cyclists on the bicycle lanes	.086	-.077	-.063	.649
I have not access to a bathroom at my workplace	-.005	-.006	-.039	.624
There are no good bike parking at my workplace	.022	-.029	.016	.624
There is addresscode at my workplace	.045	-.039	.075	.642
I normally deliver or pick up kids on the way	.027	-.078	.150	.384
I am normally too tired to cycle	.051	-.148	.050	.543







Existence	Est.	P-value
Male	-0.315	0.000
Age	0.004	0.037
Education sector	0.077	0.076
Utilitarian and recreation cycling	0.488	0.000
Mountain, BMX ...	0.122	0.013
Cycling 11-20km on weekday	0.344	0.000
Cycling 21-30km on weekday	0.39	0.000
Cycling 31-40km on weekday	0.701	0.000
Cycling more than 40km on weekday	0.624	0.000
Cycling 6-10km on weekends	0.108	0.021
Cycling 11-20km on weekends	0.136	0.054
Cycling 21-30km on weekends	0.247	0.034
Cycling more than 40km on weekends	0.161	0.082
Cycling to work 2-3 days of month	0.238	0.007
Cycling to work 1 day of week	0.201	0.069
Cycling to work 2-3 days of week	0.269	0.001
Cycling to work 4-5 days of week	0.316	0.000
Cycling to work every day	0.463	0.000

Relatedness	Est.	P-value
Male	-0.159	0.000
Distance to work 0-5km	0.117	0.124
Arts, entertainment and sports sector	0.099	0.106
Professional and technical services sector	-0.218	0.025
Mountain, BMX ...	0.101	0.041
Racerbike	0.090	0.082
Cycling 6-10km on weekdays	0.083	0.108
Cycling 6-10km on weekends	0.106	0.024
Cycling 11-20km on weekends	0.183	0.012
Cycling 31-40km on weekends	-0.245	0.060
Cycling more than 40km on weekends	0.221	0.007
Bicycle + transit daily to work	0.224	0.116



Difficulties	Est.	P-value
Age	-0.009	0.000
Cycling 31-40km on weekday	-0.249	0.047
Cycling 21-30km on weekends	-0.242	0.020
Cycling more than 40km on weekends	-0.224	0.010
Manufacturing sector	-0.114	0.144
Public utilities sector	-0.187	0.147
Utilitarian and recreation cycling	-0.073	0.055
Has lived in Denmark since childhood	-0.189	0.003
Distance to work 6-10km	-0.399	0.000
Distance to work 11-15km	-0.243	0.000
Distance to work 16-20km	-0.164	0.022
Cycling to work 2-3 days of month	-0.164	0.017
Cycling to work 1 day of week	-0.164	0.094
Cycling to work 2-3 days of week	-0.340	0.000
Cycling to work 4-5 days of week	-0.524	0.000
Cycling to work every day	-0.575	0.000

F3	Growth	Est.	P-value
AGE	Age	-0.011	0.000
Q3AE	Cycling 31-40km on weekday	0.197	0.169
Q2B	Moutain, BMX ...	0.129	0.010
Q3BE	Cycling 31-40km on weekends	0.505	0.001
Q3BF	Cycling more than 40km on weekends	0.134	0.129
C_1	Manufacturing sector	0.270	0.005
C_8	Financial and real estate sector	-0.318	0.019
C_11	Education sector	-0.182	0.000
F1	Relatedness factor	0.815	0.000
F2	Existence factor	0.346	0.000

B2WP	Participation in the bike-to-work	Est.	P-value
Q5a	Firm participates every year	2.141	0.000
Q5b	Firm participated a few times	1.339	0.000
Q5c	Firm participated in 2016	0.704	0.020
Q5d	Firm never participated	-0.432	0.000
F3	Growth factor	0.172	0.000
F4	Difficulties factor	-0.164	0.000



- Participation in the bike-to-work program is positively related to self-actualization with respect to competitiveness (growth) and negatively related to perceived cycling difficulties.
- Personal growth needs are positively related to existence and relatedness needs. Social norms and bonding are a stronger contributor to competitiveness than fitness or health needs.
- Firm's consistent participation in the bike-to-work campaign over several years is an important factor in the bike-to-work campaign of its employees.



- The perceived cycling difficulties is the only factor that was found significantly related to cycling distance.
- The needs are positively associated with cycling habits on weekdays and on weekends, the availability of a mountain bike/BMX, cycling purpose for recreation and utilitarian.
- Habitual cyclists who have lived in Denmark since childhood and who cycle greater distances with higher frequency experience less difficulties. Therefore cycling experience is positively associated with less perceived difficulties.





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Thank you for your attention!

Questions?



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