The Validation of the Self-Perceived Action Competence for Sustainability Questionnaire (SPACS-Q)

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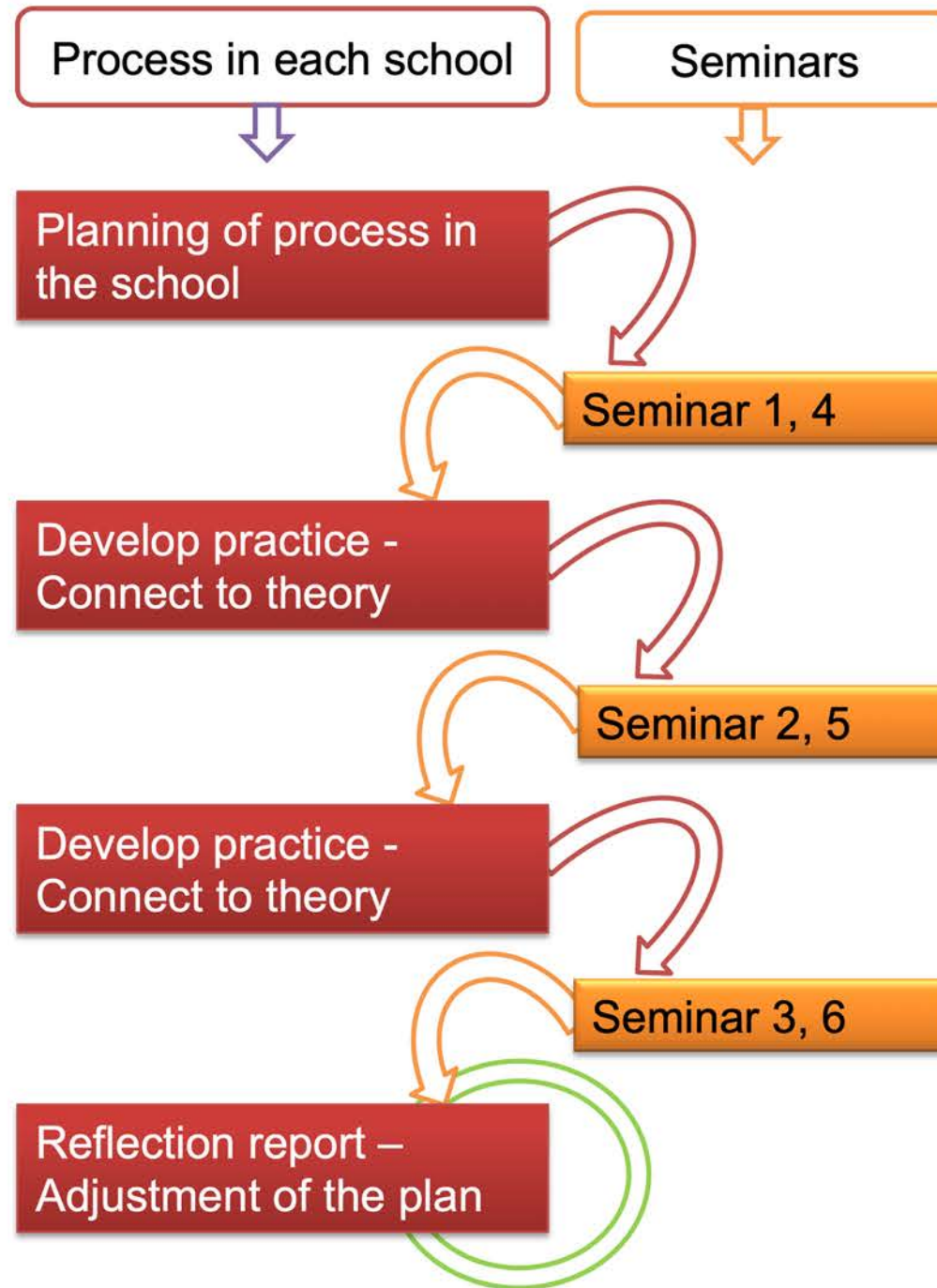
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Participating schools

- **20 pre-schools, 380 pre-school teachers**

- **4 compulsory schools (grade 1-9),120 teachers, (650 students)**

- **1 upper secondary school, grade 10-12, 80 teachers, (1000 students)**

(Timperley, 2011)

The longitudinal research project 2017-2019

Interviews
- School leaders
- Preschool teachers
- Teachers, grade 1-12
- Students, grade 10-12

Log-books, the project coordinators in the schools write on regular basis.

Quantitative survey data:
Teachers in grade 1-12
- E.g. Sustainability consciousness (SC), Understanding of ESD, Self-efficacy for ESD

Students
- SC (Gericke, Boeve-De Pauw, Berglund, & Olsson, 2018)
- Experiences of ESD teaching (Boeve-de Pauw, Gericke, Olsson & Berglund, 2015)
- Well-being (The ELSA study in Sweden, Engh-Kraft et al. 2011)
- (Self-perceived) action competence for sustainability (based on Breiting & Mogensen, 1999; Jensen & Schnack, 2006)

(Desimone, 2009)

The overall aim of this study is to…

- …develop and validate an instrument to measure a crucial outcome of environmental and sustainability education (ESE), and as such contribute a possible measure for implementation success in terms of people's self-perceived action competence for sustainability

Action Competence

The concept is often present in studies that aim to gather empirical information or evidence for the impact of ESE on learning outcomes

See for example:
Berglund, Gericke, & Chang Rundgren, 2014; Boeve-de Pauw & Van Petegem, 2011; Boeve-de Pauw, Gericke, Olsson, & Berglund, 2015; Cincera & Krajhanzl, 2013; Goldman, Pe'er & Yavetz, 2017; Krnel & Naglic, 2009; Liefländer, Bogner, Kibbe, & Kaiser, 2015; Negev et al., 2008; Olsson, Gericke, & Chang Rundgren, 2016

Towards sustainability actions and competences?

Knowledge → Attitudes → Behaviors

(e.g. Ajzen, 1991: Ajzen & Fishbein, 1980; Hines et al 1986)
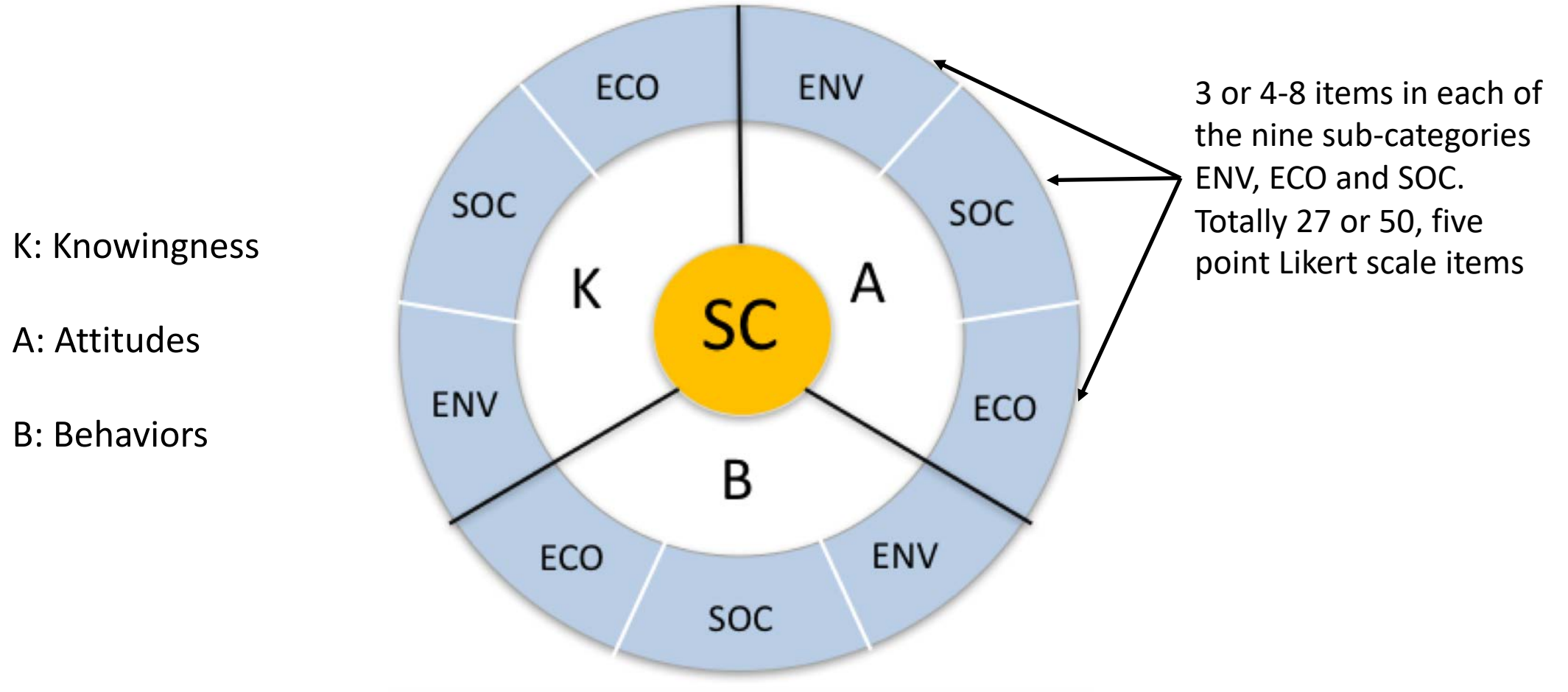
Example of scales: Alisat & Reimer, 2015; Biasutti & Frate, 2016; Bogner & Wiseman, 2006; Cincera & Krajhanzl, 2013; Dunlop, 2008; Goldman, Yavetz, & Pe'er, 2006; Kaiser, Merten, & Wetzel, 2018; Rieß & Mischo, 2019

Cognitive

Environmental consciousness

Behavioral ↔ Affective
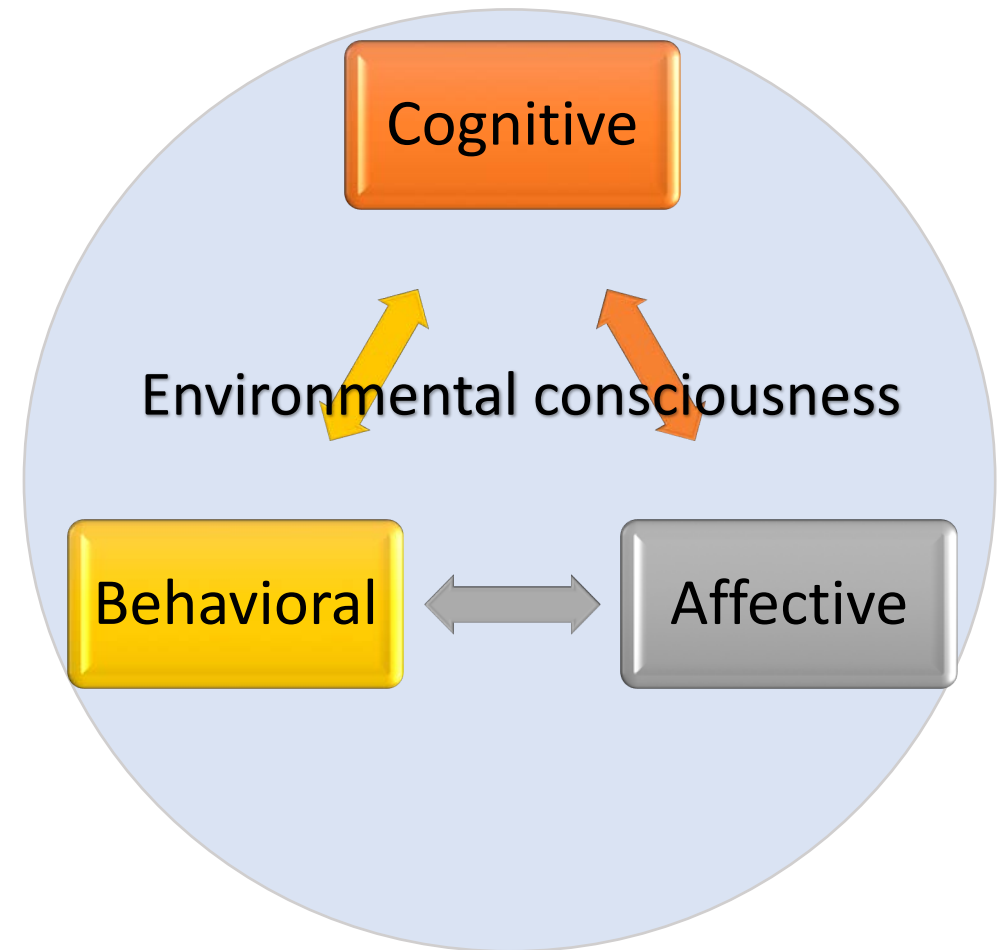
(e.g. Jiménez Sanchez & Lafuente, 2010; Kollmuss & Agyeman, 2002; Jensen & Schnack, 1997)

Sustainability Consciousness (SC)

K: Knowingness

A: Attitudes

B: Behaviors

3 or 4-8 items in each of the nine sub-categories ENV, ECO and SOC. Totally 27 or 50, five point Likert scale items

Gericke, N., J. Boeve de-Pauw, T. Berglund, and D. Olsson. 2019. "The Sustainability Consciousness Questionnaire (SCQ): The Theoretical Development and Empirical Validation of an Evaluation Instrument for Stakeholders Working with Sustainable Development." *Sustainable Development* 27 (1): 35-49.

Action Competence
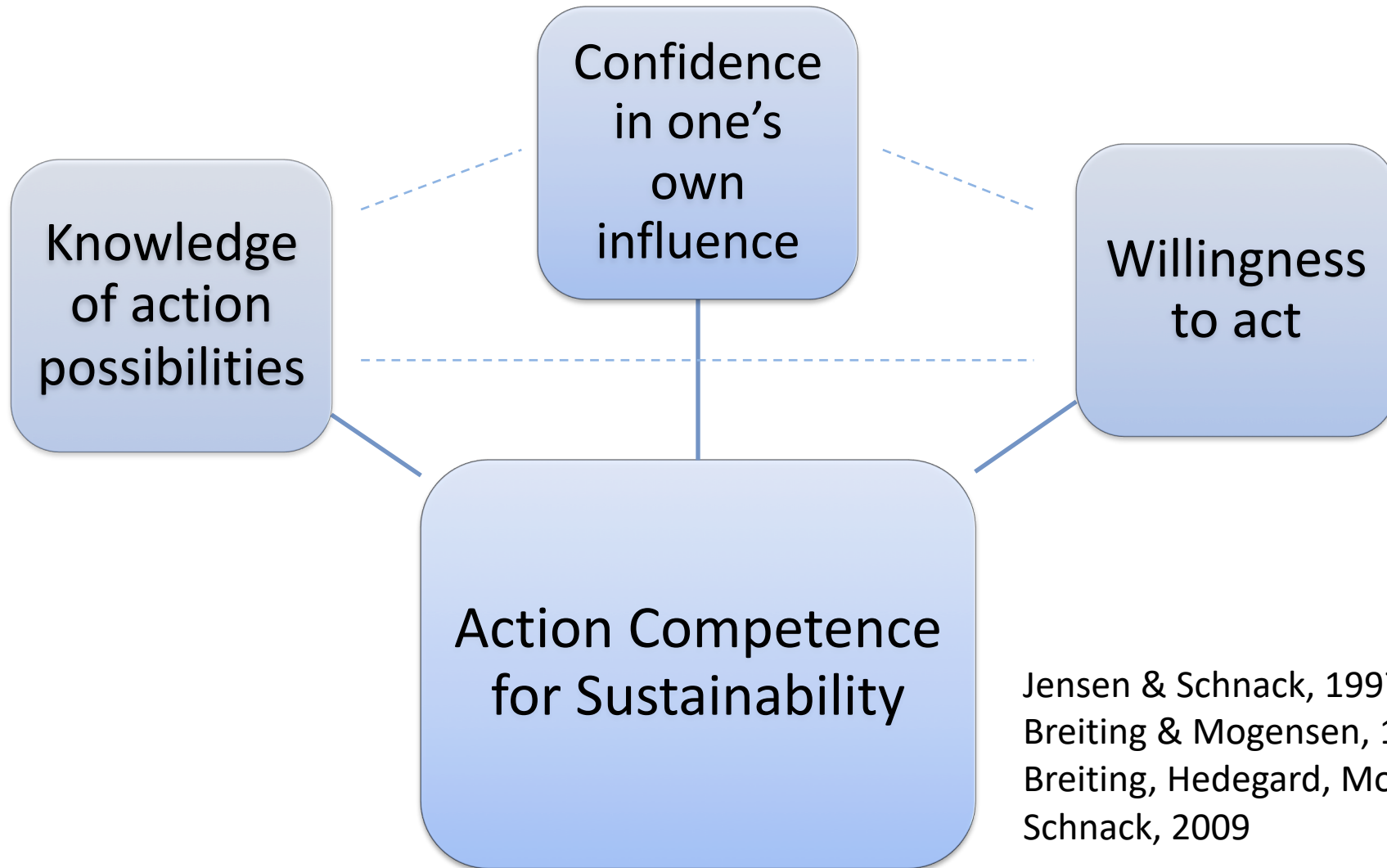
Confidence in one's own influence

Knowledge of action possibilities

Willingness to act

Action Competence for Sustainability

Jensen & Schnack, 1997;
Breiting & Mogensen, 1999;
Breiting, Hedegard, Mogensen Nielsen, &
Schnack, 2009

A model of Self-Perceived Action Competence
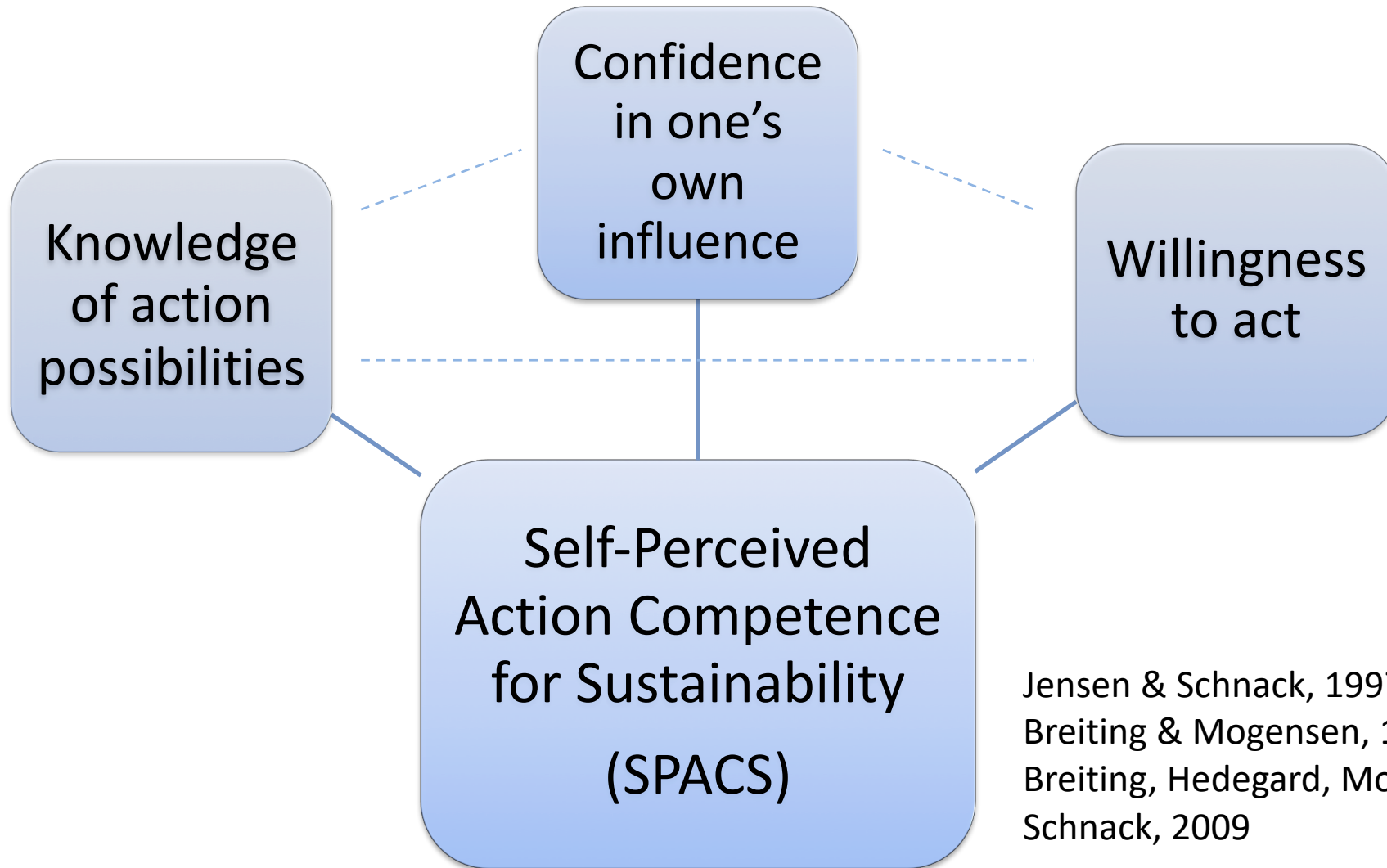
Confidence in one's own influence

Knowledge of action possibilities

Willingness to act

Self-Perceived Action Competence for Sustainability (SPACS)

Jensen & Schnack, 1997;
Breiting & Mogensen, 1999;
Breiting, Hedegard, Mogensen Nielsen, & Schnack, 2009

Bamberg & Möser, 2007

The connection to environmental psychology theory

Being effective - This part is about the empowerment of people, enhancing one's feeling of confidence, competence and clear-headedness. (Kaplan & Kaplan, 2009)

Confidence in one's own influence

Knowledge of action possibilities

Willingness to act
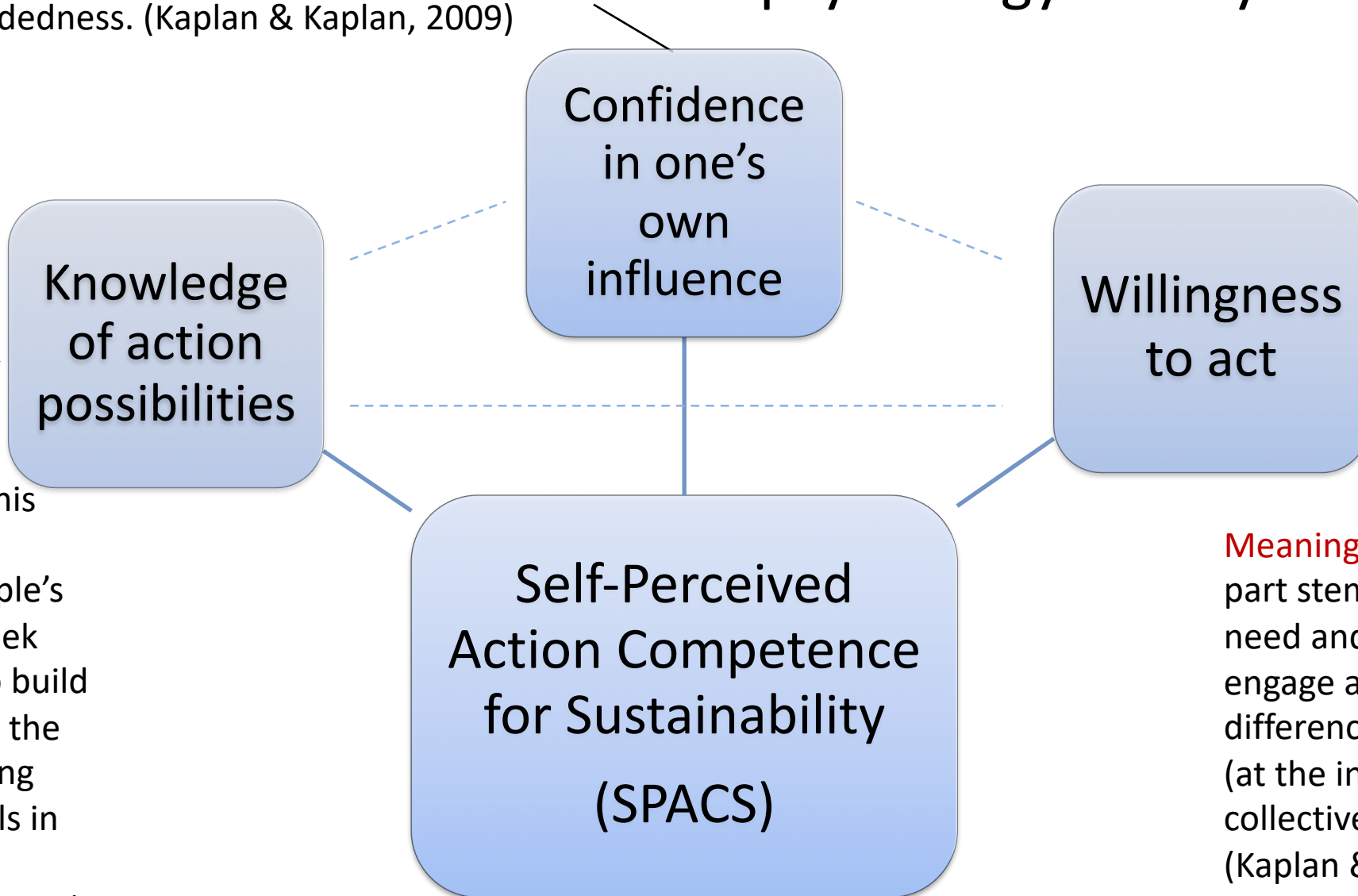
Model building - This part is about strengthening people's competences to seek information and to build knowledge around the possibilities for using such mental models in actions
(Kaplan & Kaplan, 2009)

Self-Perceived Action Competence for Sustainability (SPACS)

Meaningful action –This part stems from people's need and willingness to engage and make a difference
(at the individual and collective level)
(Kaplan & Kaplan, 2009)

Operationalization of the SPACS concept into a questionnaire, SPACS-Q

| Sub scale/Item		Personal	Collective	Local	Global
Knowledge of action possibilities					
1	I can see different points of view on issues when people think differently.	X			
2	I know how one should take action at school in order to contribute to sustainable development.	X		X	
3	I know how one should take action at home in order to contribute to sustainable development.	X		X	
4	I know how one should take action together with others in order to contribute to sustainable societal development.		X		X
Confidence in one´s own influence					
5	I believe I can influence global sustainable development through my actions.	X			X
6	I believe I can influence sustainable development in my community.	X		X	
7	I believe I have good opportunities to participate in influencing our shared future.		X		
8	I believe what each person does matters for sustainable development.	X			
Willingness to act					
9	I want to take action for sustainable development in my community.	X		X	
10	I want to take action for global sustainable development.	X			X
11	I want to engage in changing society towards sustainable development.		X		X
12	I want schoolwork to be about how we can shape a sustainable future together.		X		

Research questions

- RQ1: What is the *reliability and validity* of the self-perceived action competence for sustainability questionnaire SPACS-Q?

- RQ2: In relation to an established instrument in the environmental and sustainability education research field (the sustainability consciousness questionnaire), what is the *convergent validity* of the self-perceived action competence for sustainability questionnaire, SPACS-Q?

Participants

Grade	6	7	8	9	10	11	12	Total
Number of students	85	98	106	95	96	78	56	614
Girl/boy Sexratio	0.95	0.71	1.02	1.16	0.86	0.39	0.61	0.81

Results: confirmatory factor analysis (CFA)
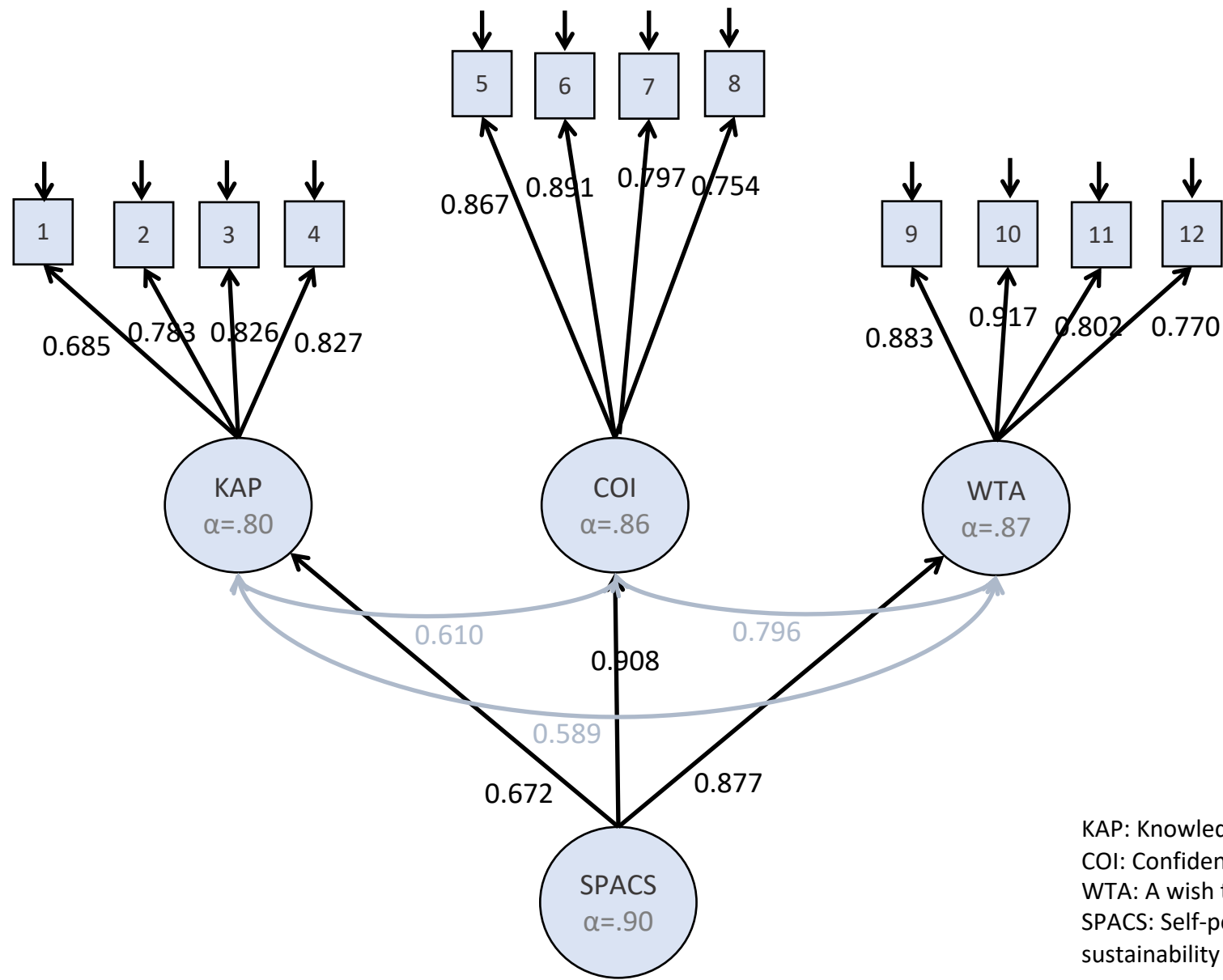
Excellent model fit

CFI = 0.989

TLI = 0.986

RMSEA = 0.058

KAP: Knowledge of action possibilities
COI: Confidence i one's one influence
WTA: A wish to act
SPACS: Self-perceived action competence for sustainability

Results: descriptive statistics

Dimensions and items in the SPACS-Q		Likert scale answers						Estimates		
		1	2	3	4	5		M	SD	Factor weight
KAP : Knowledge of Action Possibilities								**3.80**	**0.84**	
1		4.7%	3.7%	24.1%	30.3%	37.1%		3.91	1.09	0.685
2		6.2%	8.1%	29.6%	32.7%	23.3%		3.59	1.12	0.783
3		3.9%	3.4%	20.7%	37.6%	34.4%		3.95	1.02	0.826
4		4.1%	6.0%	28.8%	34.2%	26.9%		3.74	1.05	0.827
COI : Confidence in Own Influence **"I believe …"**								**3.65**	**1.01**	
5		10.6%	8.3%	27.5%	26.2%	27.4%		3.51	1.27	0.867
6		8.0%	8.3%	29.5%	27.0%	27.2%		3.57	1.20	0.891
7		8.8%	9.9%	31.1%	24.4%	25.7%		3.48	1.22	0.797
8		4.9%	3.6%	22.0%	22.0%	47.6%		4.04	1.13	0.754
WTA : Willingsness To Act **"I want …"**								**3.54**	**1.02**	
9		7.3%	8.5%	30.3%	25.2%	28.7%		3.59	1.20	0.883
10		6.4%	6.0%	27.2%	28.7%	31.8%		3.73	1.16	0.917
11		8.3%	11.4%	33.4%	23.5%	23.5%		3.42	1.20	0.802
12		10.4%	10.1%	31.6%	22.3%	25.6%		3.43	1.26	0.770

Results: reliability measures

Scale		SPACS-Q					SCQ-S			
		SPACS	KAP	COI	WTA		SC	K	A	B
Items		12	4	4	4		27	9	9	9
Cronbach's α		.90	.80	.86	.87		.87	.82	.82	.78

CFA of the SCQ-S
CFI = 0.953
TLI = 0.960
RMSEA = 0.025

Results, convergent validity

	KAP	COI	WTA	SPACS-Q	K	A	B	SCQ-S
KAP	1	.485*	.495*	.763*	.391*	.399*	.510*	.539*
COI		1	.656*	.867*	.380*	.435*	.501*	.521*
WTA			1	.872*	.450*	.486*	.585*	.611*
SPACS-Q				1	.489*	.529*	.636*	.666*
K					1	.610*	.444*	.833*
A						1	.398*	.807*
B							1	.796*
SCQ-S								1

* Pearson's correlation (*r*) is significant at the 0.01 level (2-tailed)

Conclusions

1. We claim that the SPACS-Q is a novel and theory-driven empirically sound instrument.

2. We therefore invite and encourage fellow researchers to use the SPACS-Q in investigations including monitoring the self-perceived action competence for sustainability concept among people and for further validation.

Thank you for your attention!

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