

Psychosocial factors at work in a 5-years-longitudinal study: COPSOQ and ERI in the „Gutenberg Health Study“ (Mainz, Germany)

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SOZIALMEDIZIN



COPSOQ

b a u a :
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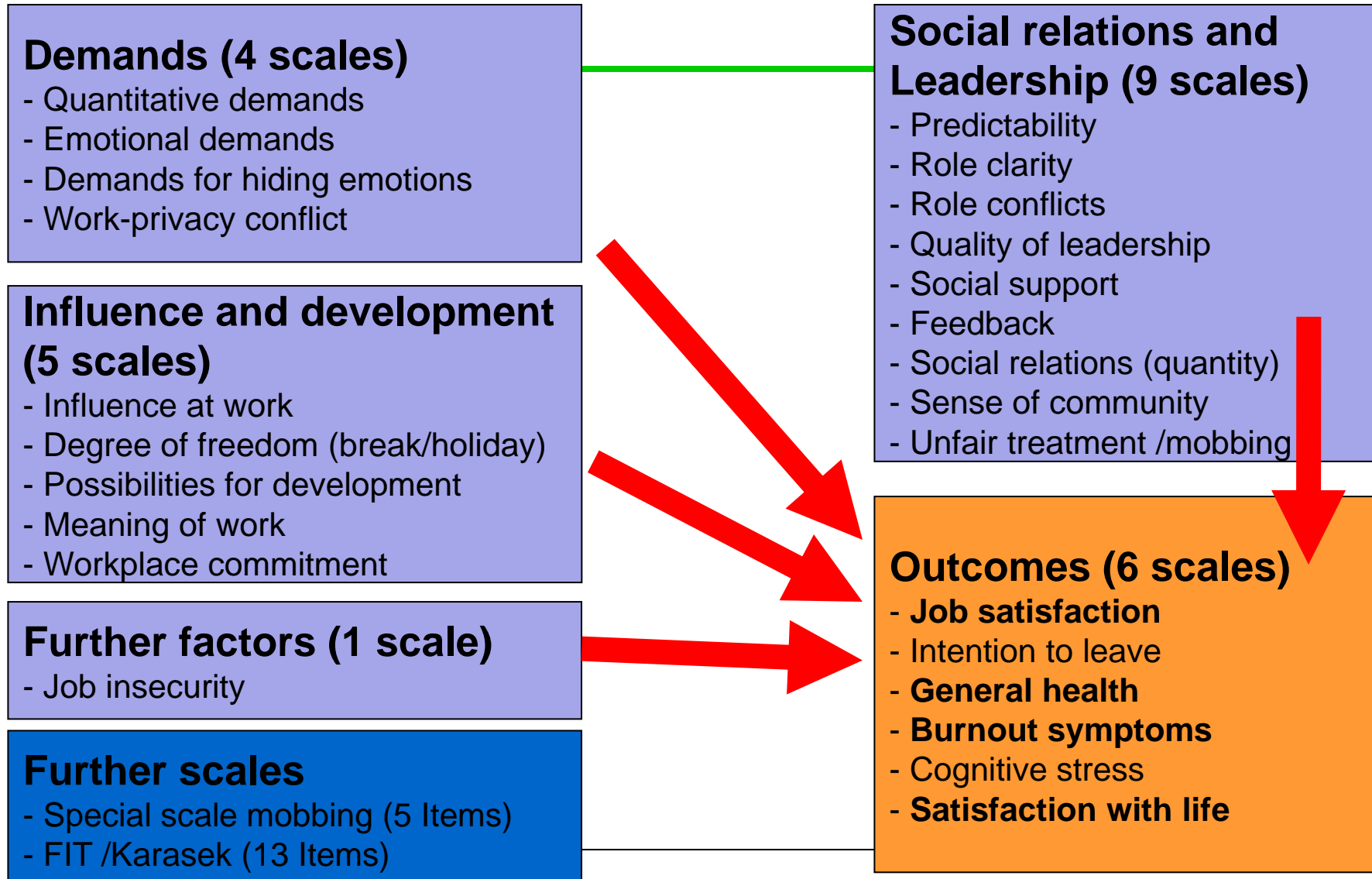
We had 3 jobs to do ...

- Is „it“ valid?
 - Is COPSOQ a valid instrument to measure psychosocial factors?
 - Answer: YES, see validation studies. International: Burr et al. (2019), Germany: Lincke et al (2021), many others countries: website
- Can we estimate instead of measure?
 - Is there something like a Job-Exposure-Matrix (JEM) to predict psychosocial factors by occupation?
 - Answer: NO, only in parts (ED, INF but not for QL, SC...). Nübling et al. 2017 and many of the analysis by profession/occupation of COPSOQ-teams worldwide (seen also on this workshop)
- Are causes really causes?
 - Which direction are the arrows, is there reversed causality?
 - Answer: Today: The arrows are (mostly) like the model says. Causes are causes and symptoms follow causes.

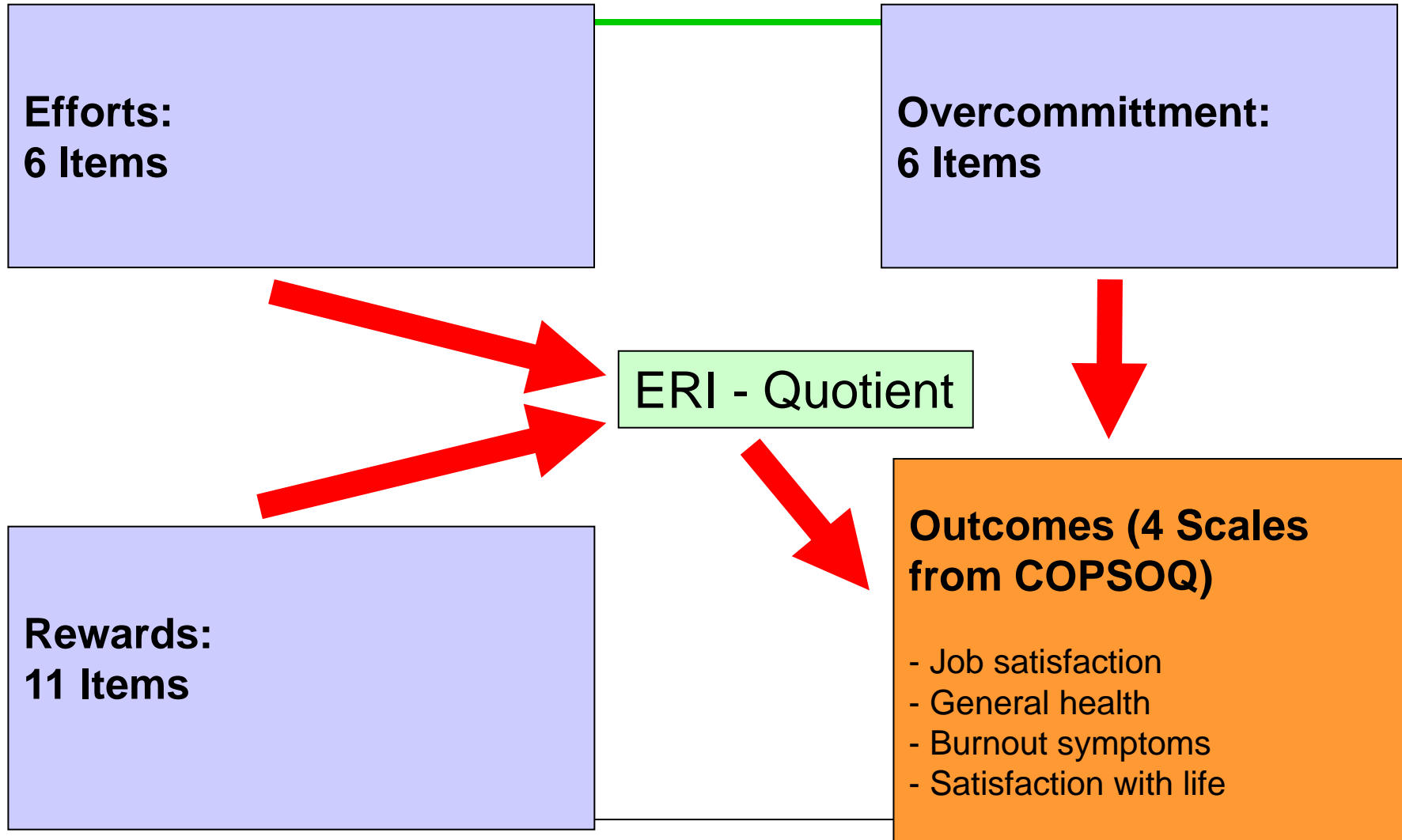
Background and Aims

- Many cross-sectional studies on relation: psychosocial factors at work („causes“) and health and job satisfaction („outcomes“)
- Longitudinal studies are rare
- Application of COPSOQ (Copenhagen Psychosocial Questionnaire) and ERI (Effort-Reward-Imbalance) in the GHS (large representative population based study in Mainz, Germany)
- T0 (baseline), T1 (follow-up) five years later

Content of COPSOQ - Version GHS (baseline)



Content of ERI - Version GHS (baseline)



Methods

- Survey of all persons of GHS employed at survey point
- T0: COPSOQ (n = 4.322), ERI (n = 4.358)
- T1: COPSOQ (n = 3.091), ERI (n = 3.142)
- 4 Outcomes: Job satisfaction, General health, Burnout symptoms, Satisfaction with life
- Regression models T0 (see publication 1, 2013) and T1
- Regression models T0 -> T1 (with and without adjusting für outcomes at T0)

RESEARCH ARTICLE

Open Access

The Gutenberg Health Study: measuring psychosocial factors at work and predicting health and work-related outcomes with the ERI and the COPSOQ questionnaire

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Abstract

Background: Several instruments have been developed to assess psychosocial workload. We compared two of these instruments, the Effort-Reward Imbalance (ERI) model and the Copenhagen Psychosocial Questionnaire (COPSOQ) with regard to congruent validity and internal validity.

Methods: This analysis is based on a population-based sample of the baseline examination of 2,783 employees from the Gutenberg Health Study (GHS). About half of the participants completed the ERI questionnaire (n = 1,342), the other half completed the COPSOQ (n = 1,441). First, the two samples were compared and descriptive analyses were carried out calculating mean values for both instruments in general, then separately for age, gender and main occupational groups. Second, we analyzed the relationship between ERI and COPSOQ scales on the workplace situation and on the workplace outcomes: job satisfaction, general health, burnout, satisfaction with life, by applying stepwise logistic regression analysis.

Results and discussion: For the majority of occupations, high effort as reflected by the ERI corresponded with high demands as reflected by the COPSOQ. Comparably, high reward (according to ERI) yielded a good agreement with high "influence and development" (according to COPSOQ). However, we could also find differences between ERI and COPSOQ concerning the intensity of psychosocial workload in some occupations (e.g., physicians/pharmacists or warehouse managers/warehousemen/transport workers). These differences point to differing theoretical concepts of ERI and COPSOQ. When the ability of ERI and COPSOQ was examined to determine the associations with health and work outcomes, burnout could be better predicted by the COPSOQ; this might be due to the fact that COPSOQ comprises the constructs "work-privacy conflict" and "emotional demand", which are closely related to burnout. However, methodological differences between these instruments limit their direct comparability.

Conclusions: The ERI and COPSOQ instrument yielded similar results for most occupational groups. The slightly stronger association between psychosocial workload as assessed by COPSOQ and burnout might be explained by its broader approach. The ability of the ERI and COPSOQ instrument to reflect relevant risk factors for clinically manifest disorders (e.g., coronary heart disease) will be derived from subsequent prospective analyses of the GHS with the follow-up data.

Keywords: Psychosocial factors, Stress, Strain, COPSOQ, ERI

Publication 1: Baseline (cross-sectional) (T0) with comparison COPSOQ-ERI (2013)

Results T0 and T1

Table S2 COPSOQ cross-sectional linear regression models selected with forward stepwise regression (factors shown in the order of selection) for four health and work-related outcomes at the baseline (t0) or at the 5-year follow-up (t1).

Outcomes at t0 or t1	COPSOQ (t0)			COPSOQ (t1)		
	Scales	Beta (SE)	R ²	Scales	Beta (SE)	R ²
Job satisfaction at t0 or t1			0.52			0.56
	Quality of leadership	0.201 (0.009)		Quality of leadership	0.177 (0.011)	
	Meaning of work	0.239 (0.011)		Meaning of work	0.227 (0.013)	
	Sense of community	0.204 (0.012)		Sense of community	0.194 (0.014)	
	Degree of freedom at work	0.078 (0.007)		Predictability	0.134 (0.013)	
	Job Insecurity	-0.097 (0.009)		Work-Privacy conflict	-0.071 (0.008)	
	N=3164			N=2309		
General health at t0 or t1			0.11			0.10
	Job insecurity	-0.118 (0.015)		Predictability	0.058 (0.018)	
	Possibilities for	0.165 (0.016)		Work-Privacy conflict	-0.099 (0.013)	
	Emotional demands	-0.078 (0.015)		Possibilities for	0.097 (0.019)	
	Work-Privacy conflict	-0.061 (0.012)		Sense of community	0.082 (0.021)	
	Mobbing (1 Item)	-0.069 (0.015)		Job insecurity	-0.058 (0.016)	
	N=3151			N=2299		
Burnout at t0 or t1			0.31			0.29
	Work-Privacy conflict	0.193 (0.011)		Work-Privacy conflict	0.197 (0.014)	
	Possibilities for	-0.215 (0.015)		Job insecurity	0.158 (0.017)	
	Emotional demands	0.187 (0.014)		Possibilities for	-0.195 (0.019)	
	Job insecurity	0.132 (0.014)		Emotional demands	0.174 (0.017)	
	Mobbing (1 Item)	0.105 (0.013)		Sense of community	-0.122 (0.021)	
	N=3164			N=2311		
Satisfaction with Life Scale at t0 or t1			0.21			0.21
	Job insecurity	-0.173 (0.014)		Meaning of work	0.144 (0.021)	
	Meaning of work	0.095 (0.020)		Job insecurity	-0.134 (0.017)	
	Work-Privacy conflict	-0.121 (0.011)		Work-Privacy Conflict	-0.114 (0.013)	
	Possibilities for	0.170 (0.018)		Sense of community	0.124 (0.021)	
	Sense of community	0.139(0.019)		Possibilities for	0.116 (0.020)	
	N=3159			N=2308		

R² = Proportion of the variance explained by the model. SE Standard Error; N valid case number (fluctuates due to missing values)

Results

T0 -> T1

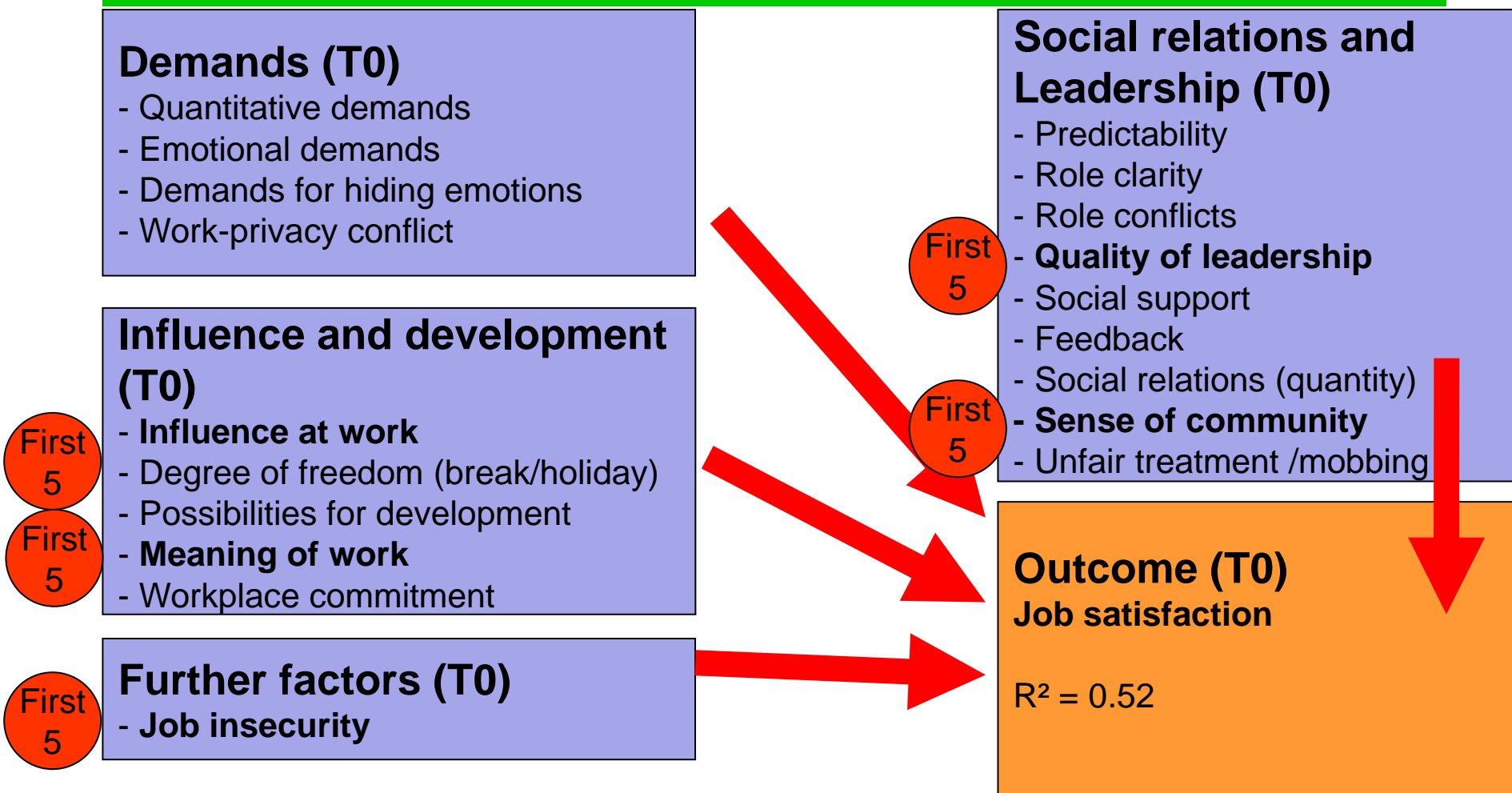
Table 7 COPSOQ prospective linear regression models selected with forward selection). Four health and work related outcomes at the 5-year follow-up (t1) v

Outcomes at t1	COPSOQ (t0)		R ²
	Scales	Beta (SE)	
Job satisfaction at t1			0.24
	Meaning of work	0.145 (0.017)	
	Sense of community	0.157 (0.019)	
	Predictability	0.098 (0.018)	
	Job insecurity	-0.110 (0.014)	
	Quality of leadership	0.080 (0.015)	
	N= 2281		
General health at t1			0.07
	Job insecurity	-0.101 (0.017)	
	Mobbing (1 Item)	-0.068 (0.017)	
	Work-Privacy conflict	-0.049 (0.014)	
	Possibilities for development	0.091 (0.019)	
	Emotional demands	-0.047 (0.017)	
	N= 2270		
Burnout at t1			0.17
	Work-Privacy conflict	0.113 (0.015)	
	Job insecurity	0.151 (0.018)	
	Possibilities for development	-0.168 (0.021)	
	Emotional demands	0.172 (0.019)	
	Predictability	-0.091 (0.020)	
	N= 2296		
Satisfaction with Life Scale at t1			0.16
	Meaning of work	0.114 (0.023)	
	Job insecurity	-0.152 (0.017)	
	Sense of community	0.136 (0.022)	
	Work-Privacy conflict	-0.077 (0.013)	
	Possibilities for development	0.114 (0.022)	
	N= 2295		

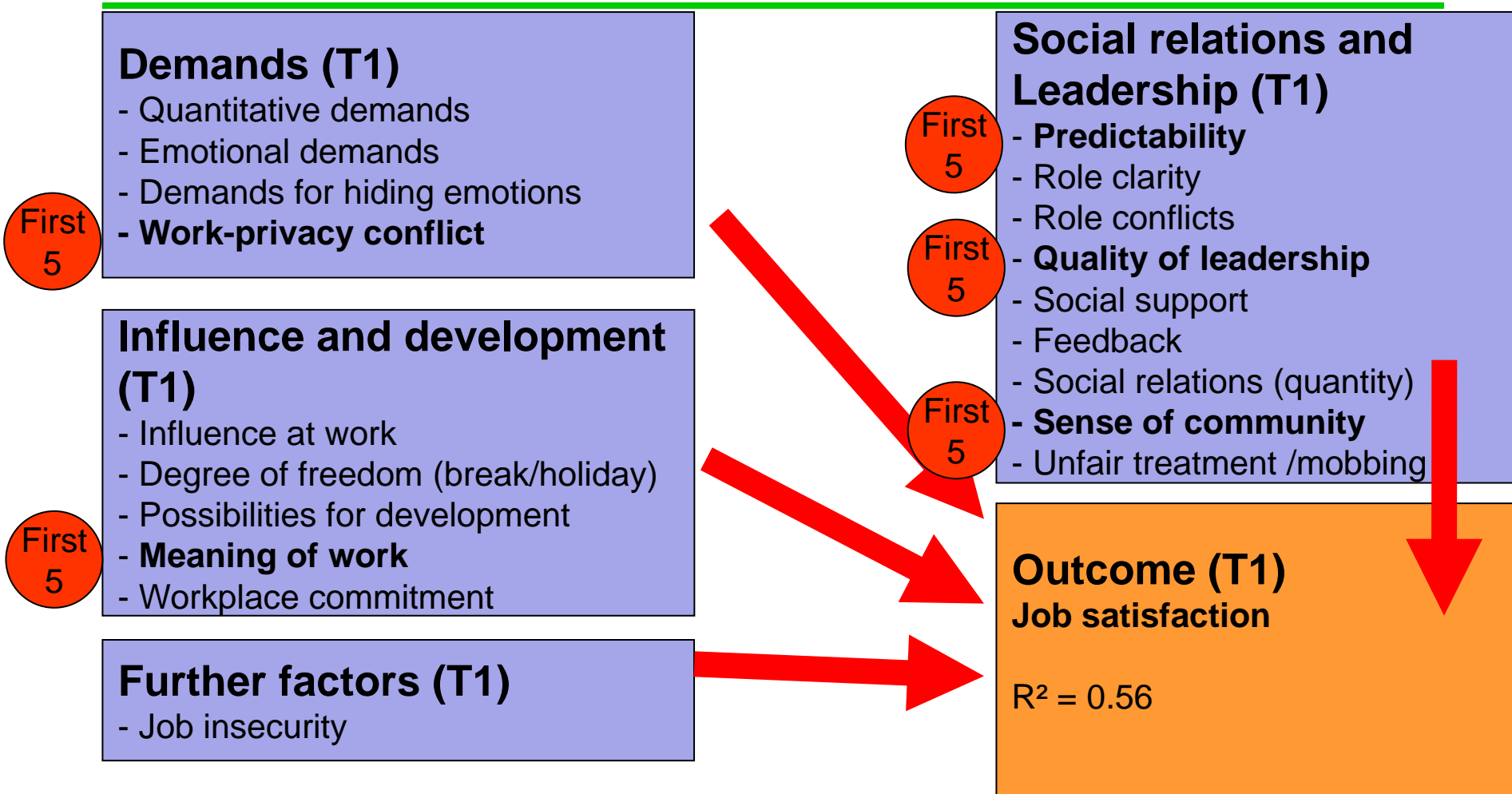
Results (compressed)

- R^2 for 4 models at baseline (T0) and follow-up (T1) similar (ERI: 0.10 - 0.43; COPSOQ: 0.10 - 0.56).
- T1-outcomes with T0-causes: weaker relations (ERI 0.07 - 0.19; COPSOQ 0.07 - 0.24) but still significant.
- Loss in prediction especially for scale „job satisfaction“

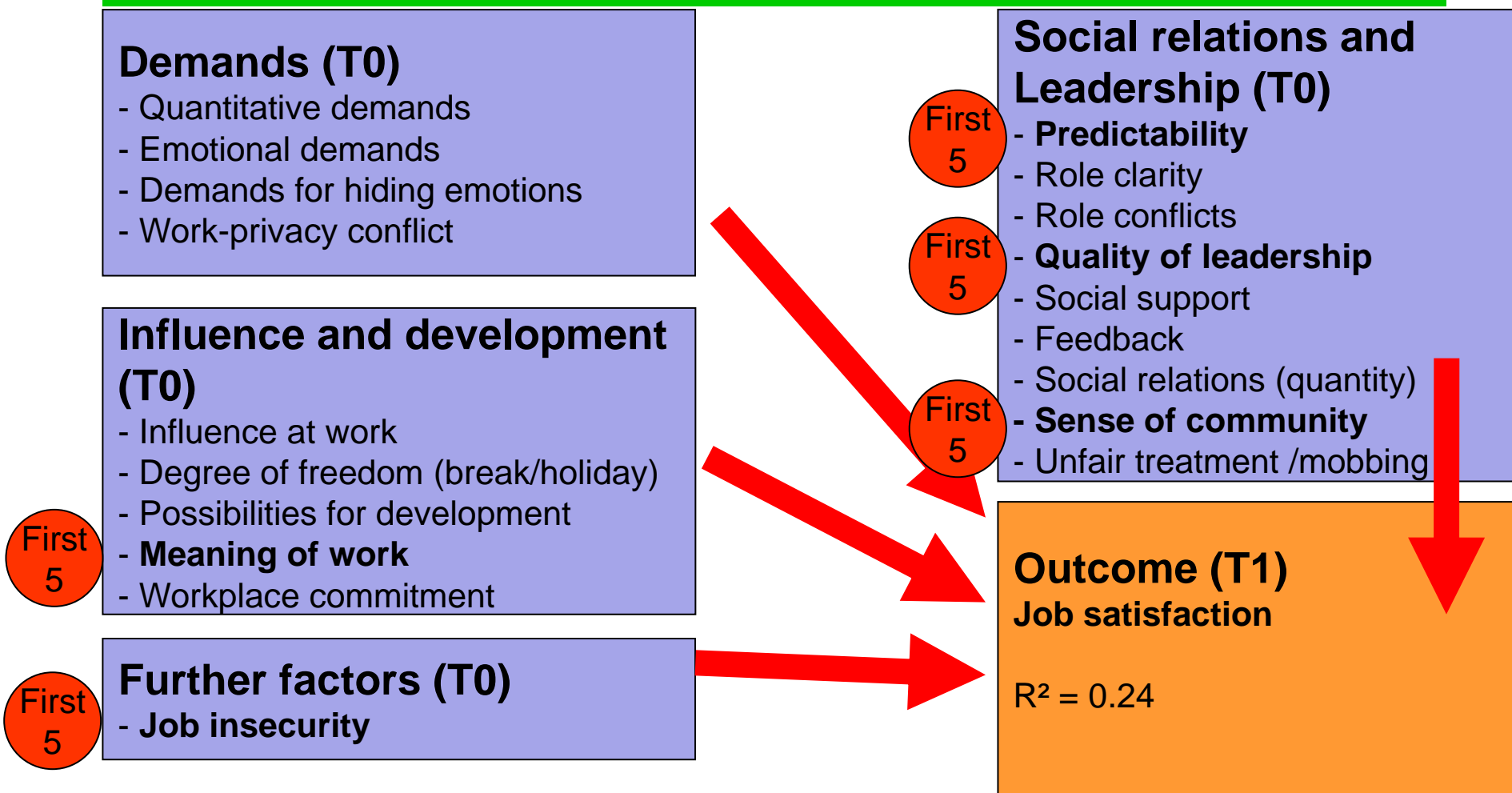
Example COPSOQ-Model on Job satisfaction, GHS T0 (baseline), 5 first predictors



Example COPSOQ-Model on Job satisfaction, GHS T1 (follow up), 5 first predictors



Example COPSOQ-Model on Job satisfaction, GHS T1 (follow up), 5 first predictors from T0 (baseline)



Discussion

- High conformity of models for COPSOQ and ERI (i.e. criterion validity)
- Association of working conditions (cause, predictor) and satisfaction / health (outcomes, criterion) from cross-sectional analysis are existing als longitudinally (similar prediction models but weaker relations)
- **Working conditions are predictors for satisfaction and health in a causal manner!**
- Limitations: only 2 measurement points, no information on duration/persistence (dose). I.e.: Quality of leadership -> Job satisfaction

RESEARCH ARTICLE

Open Access



The Gutenberg health study: a five-year prospective analysis of psychosocial working conditions using COPSOQ (Copenhagen psychosocial questionnaire) and ERI (effort-reward imbalance)

Matthias Nuebling^{1†}, Janice Hegewald^{2†}, Karla Romero Starke², Hans-Joachim Lincke¹, Sylvia Jankowiak³, Falk Liebers³, Ute Latza³, Stephan Letzel⁴, Merle Riechmann-Wolf^{4,5}, Emilio Gianicolo^{6,7}, Manfred Beutel⁸, Norbert Pfeiffer⁹, Klaus Lackner¹⁰, Thomas Münzel^{11,12}, Philipp S. Wild^{11,13,14} and Andreas Seidler²

Abstract

Background: Psychosocial working conditions were previously analyzed using the first recruitment wave of the Gutenberg Health Study (GHS) cohort ($n = 5000$). We aimed to confirm the initial analysis using the entire GHS population at baseline ($N = 15,010$) and at the five-year follow-up. We also aimed to determine the effects of psychosocial working conditions at baseline on self-rated outcomes measured at follow-up.

Methods: At baseline, working GHS participants were assessed with either the Effort-Reward-Imbalance questionnaire (ERI) ($n = 4358$) or with the Copenhagen Psychosocial Questionnaire (COPSOQ) ($n = 4322$); participants still working after five years received the same questionnaire again (ERI $n = 3142$; COPSOQ $n = 3091$). We analyzed the association between working conditions and the outcomes job satisfaction, general health, burnout, and satisfaction with life at baseline, at follow-up and also prospectively from baseline to follow-up using linear regression models. We examined the outcome variance explained by the models (R^2) to estimate the predictive performance of the questionnaires.

Results: The models' R^2 was comparable to the original baseline analyses at both t_0 and t_1 (R^2 range: ERI 0.10–0.43; COPSOQ 0.10–0.56). However, selected scales of the regression models sometimes changed between assessment times. The prospective analysis showed weaker associations between baseline working conditions and outcomes after five years (R^2 range: ERI 0.07–0.19; COPSOQ 0.07–0.24). This was particularly true for job satisfaction. After adjusting for the baseline levels of the outcomes, fewer scales still explained some of the variance in the distribution of the outcome variables at follow-up. The models using only data from t_0 or t_1 confirmed the previous baseline analysis. We

Publication 2:
Longitudinal
study: (T0, T1,
T0 -> T1)
including
comparison
COPSOQ-ERI
(2022)

We had 3 jobs to do ...

- Is „it“ valid?
 - YES
- Can we estimate instead of measure?
 - NO
- Are causes really causes?
 - YES

Thank you for your attention!



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