MEASURING MILITARY JOB ADAPTABILITY DEMANDS; A FIRST VALIDATION

ESTHER OPRINS
MARJOLEINE T HART

TNO innovation for life

THE WORLD IS (ALWAYS) CHANGING

SOCIAL /DEMOGRAPHIC

- Urbanisation
- Migration/Diaspora
- Birth rates
  (greying & youth bulges)
- Prosperity

WORLDWIDE SHARING & CONNECTEDNESS

- Ideas & ideologies
- Research & education
- (Social) media
- *Internet of everything*

IDENTITY & CULTURE

- Individual & group identification with worldwide theme's
- Faultlines of civilizations
- Extremist groups

SHIFTING POWER

- Role of the State
- Shifting economic and power centres
- Vast increase in # & type of strategic actors
- Larger differences in military spending

GLOBAL ECONOMY

- Financial interdependance
- Commercial interests and ethics
- Natural resources scarcity
- Economical growth

TECHNOLOGICAL DEVELOPMENTS

- Miniaturisation, nano and conductors
- Robotization, automation & unmanned systems
- Advanced manufacturing (eg. 3D-printing, graphene)
- Novel weapons (eg. directed energy, railguns & hypersonic)
- Human Development (Bio, neuro & gen technologies)
- Energy technologies & energy storage

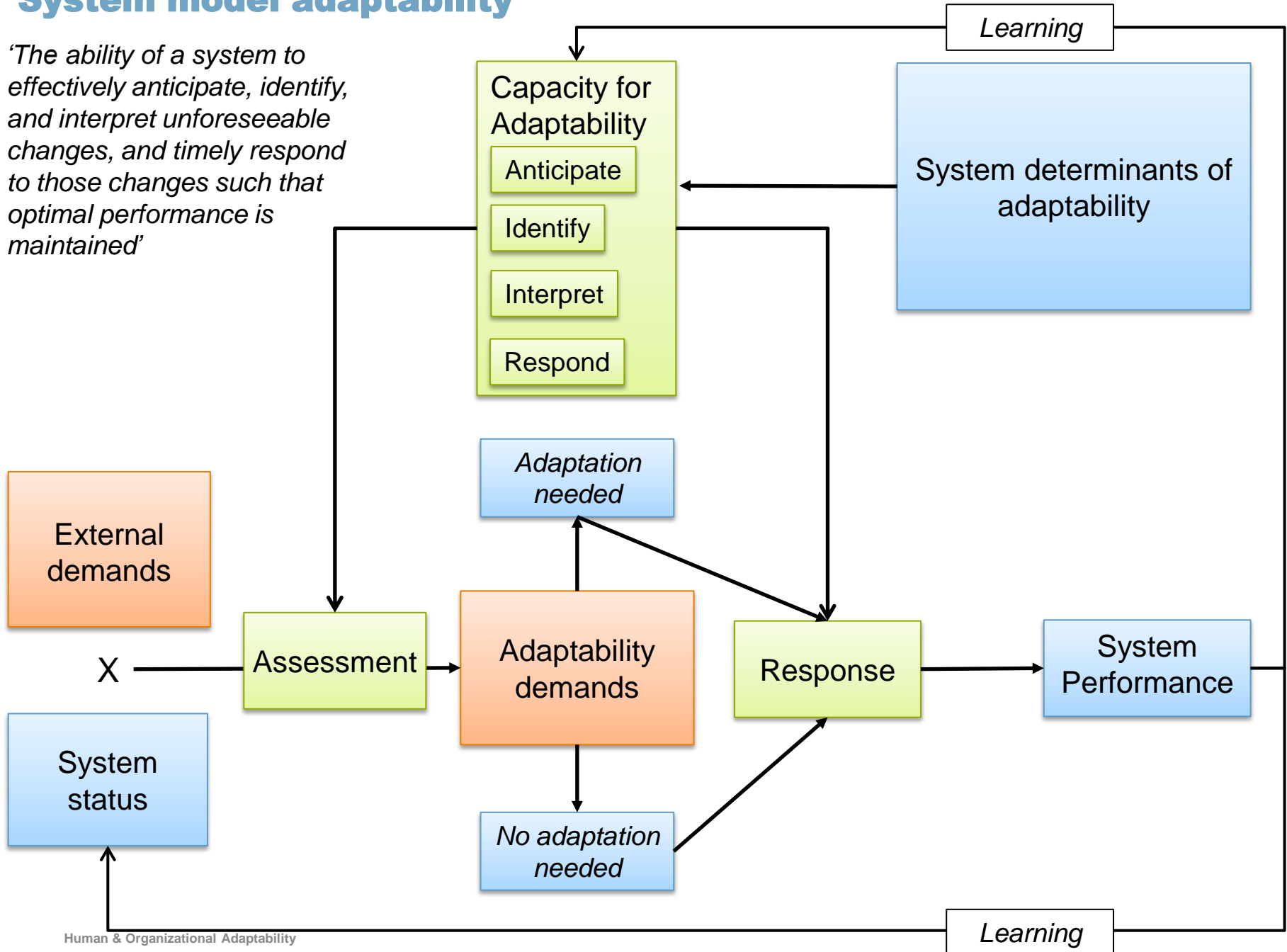# RESEARCH OBJECTIVES (2015-2018)

Organizational Adaptability

› Coin a sound definition of organizational adaptivity tailored for the military domain

› Develop a framework with the most important characteristics, conducive and inhibiting aspects of organizational adaptivity

› Provide insight in the applicability, feasibility, demands and preconditions for developing organisational adaptivity, also in relation to the individual level

› Explore and develop guidelines and methods for strengthening organizational adaptivity
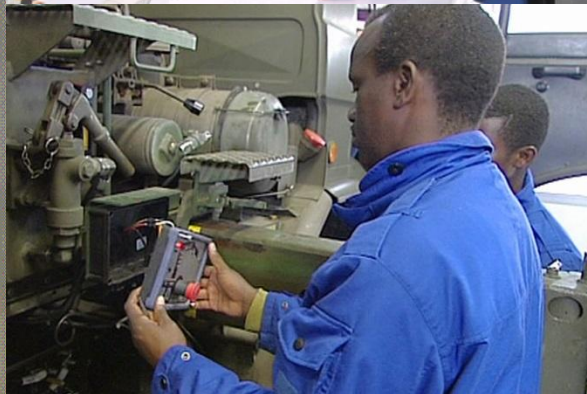
Human Adaptability

› Coin a sound definition of individual adaptivity tailored for the military domain

› Develop a visualization-model with the most important psychosocial determinants of individual adaptivity

› Gain insight in methods for measuring ánd developing the determinants of individual adaptivity

› Explore and develop guidelines and methods for strengthening individual adaptivity

› Study the interdependencies of individual and organizational adaptivity

System model adaptability

'The ability of a system to effectively anticipate, identify, and interpret unforeseeable changes, and timely respond to those changes such that optimal performance is maintained'

Capacity for Adaptability
- Anticipate
- Identify
- Interpret
- Respond

Learning

System determinants of adaptability

External demands

System status

X → Assessment → Adaptability demands → Response → System Performance

Adaptation needed

No adaptation needed

Learning

WHO NEEDS ADAPTIVITY?

DIMENSIONS OF ADAPTIVITY

Different types of situations can be distinguished; each requiring their own form of adaptive behaviours (Pulakos et al, 2000):

> Solving problems creatively
> Dealing with uncertain or unpredictable work situations
> Learning new tasks, technologies, and procedures
> Demonstrating interpersonal adaptability
> Demonstrating cultural adaptability
> Demonstrating physically oriented adaptability
> Handling work stress
> Handling emergency situations

ADAPTIVITY PROFILE (PER JOB)

Main goal: design an instrument to measure which adaptive behavior is required for which (type of) job (profiles)
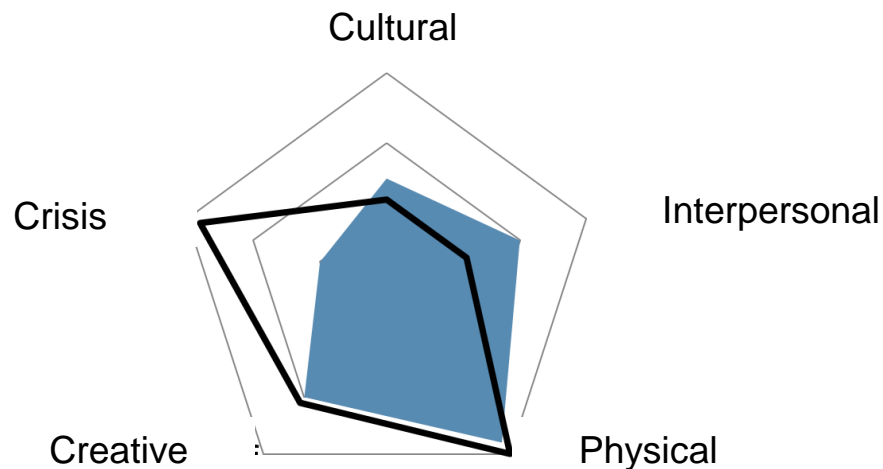
Example for a fictive job

QUESTIONNAIRE:
MILITARY INDIVIDUAL ADAPTIVITY (MIA)

Part 1: Adaptive behaviours (5 – 8 per dimension)

› Main question: "How important are the behaviours for functioning in your job?"

› Example item: "Developing different solutions for an unknown problem"

Part 2: Situations (8 dimensions of Pulakos)

› Question 1: "How important are the following situations for doing your job?"

› Question 2: "How often occur the following situations in your job?"

Respondents score all items at a 5 points rating scale

METHOD

› **Research questions:**

  › What is the psychometric quality of the MIA questionnaire?

    › Factor analysis (oblique); reliability (Cronbach's alpha)

  › Does the MIA distinguish adaptive behaviours per job type?

    › One-way ANOVA; correlations part 1 (behaviours) vs. part 2 (situations)

› **2 pilot studies: civil, high variety of jobs**

  › 1st version of MIA: N = 128

  › 2nd (revised) version of MIA: N = 112

RESULTS PILOT 1: SUMMARY

Statistical results:

› Factor structure: good loadings for all except *learning* and *unpredictable.*

› Reliability: Cronbach's alpha higher than .70 for all except *unpredictable*

Revisions MIA:

› Dimensions with good results *(emergency, creative, culture, physical, stress, interpersonal):* N (items) = 5 instead of 8, based on item-total correlations

› Reformulation and deletion of some items for *learning*

› Deletion of *unpredictable*: no good statistical results, another type of dimension and overarching other dimensions

RESULTS PILOT 2

› **Keep in MIA as is:**

  › Physical (N=6, alpha .96)

  › Cultural (N=5, alpha .92)

  › Emergency (N=5, alpha .94)

  › Stress (N=5, alpha .91)

› **Revision of items:**

  › Creative (N=5, alpha .88)

  › Interpersonal (N=5, alpha .68)

› **Delete:**

  › Learning

Pattern Matrixa

	Component						
	1	2	3	4	5	6	7
PHYSICAL3	,872						
PHYSICAL5	,872						
PHYSICAL6	,872						
PHYSICAL1	,820						
PHYSICAL11	,814						
PHYSICAL9	,793						
CREATIVE1		,833					
CREATIVE5		,682				,342	
CREATIVE4		,574					
CREATIVE2		,516	,422			-,310	
CREATIVE5		,484					
CULTURAL1			,909				
CULTURAL5			,841				
CULTURAL6			,834				
CULTURAL8			,820				
CULTURAL2			,816				
EMERGENCY2				,829			
EMERGENCY1				,717			
EMERGENCY3				,713			
EMERGENCY5	,313			,709			
EMERGENCY8				,666			
INTERPERSONAL2				,464			
STRESS2					-,846		
STRESS6					-,806		
STRESS3					-,727		
STRESS4		-,324			-,668		
STRESS1					-,645		
LEARNING6				-,320	-,514		
LEARNING3		,392			-,440		
LEARNING5						,721	
CREATIVE2		,478				,517	
CREATIVE4				,343		,517	
LEARNING7			,348			,456	
INTERPERSONAL7							,927
CREATIVE6						,380	,540

JOB CATEGORIES

Job categories (NY Times)
Administrative / Clerical
Biotech / R&D / Science
Business / Strategic Management
Customer Support / Client Care
Editorial / Writing
Education / Training
Logistics / Transportation
Manufacturing / Production / Operations
Medical / Health
Project / Program Management
Quality Assurance / Safety
Sales / Retail / Business Development
Security / Protective Services

Differences in means of situations for function groups (part 2 MIA):

One-way ANOVA

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Emergencies	Between Groups	40,750	6	6,792	7,474	,000
	Within Groups	39,982	44	,909		
	Total	80,732	50			
Creative	Between Groups	11,390	6	1,898	4,383	,001
	Within Groups	19,058	44	,433		
	Total	30,449	50			
Cultural	Between Groups	11,800	6	1,967	2,745	,024
	Within Groups	31,525	44	,716		
	Total	43,325	50			
Physical	Between Groups	15,523	6	2,587	3,438	,007
	Within Groups	33,109	44	,752		
	Total	48,632	50			
Stress	Between Groups	4,348	6	,725	,981	,450
	Within Groups	32,502	44	,739		
	Total	36,850	50			
Learning	Between Groups	2,409	6	,401	,420	,862
	Within Groups	42,075	44	,956		
	Total	44,484	50			
Interpersonal	Between Groups	6,168	6	1,028	1,217	,316
	Within Groups	37,157	44	,844		
	Total	43,325	50			
Unpredictable	Between Groups	2,859	6	,476	,617	,716
	Within Groups	33,995	44	,773		
	Total	36,854	50			

CORRELATIONS PART 1 - PART 2 MIA

		Emergency (situation)	Creative (situation)	Cultural (situation)	Physical (situation)	Stress (situation)	Interpersonal (situation)
Emergency (behaviour)	Pearson Correlation	,784	,308	,334	,475	,371	,442
	Sig. (2-tailed)	,000	,001	,000	,000	,000	,000
	N	112	112	112	112	112	112
Creative (behaviour)	Pearson Correlation	,165	,763	,164	-,027	,133	,394
	Sig. (2-tailed)	,082	,000	,084	,774	,161	,000
	N	112	112	112	112	112	112
Cultural (behaviour)	Pearson Correlation	,223	,285	,605	,134	,072	,448
	Sig. (2-tailed)	,018	,002	,000	,158	,452	,000
	N	112	112	112	112	112	112
Physical (behaviour)	Pearson Correlation	,575	,168	,313	,802	,357	,273
	Sig. (2-tailed)	,000	,076	,001	,000	,000	,004
	N	112	112	112	112	112	112
Stress (behaviour)	Pearson Correlation	,592	,402	,194	,338	,587	,472
	Sig. (2-tailed)	,000	,000	,040	,000	,000	,000
	N	112	112	112	112	112	112
Learning (behaviour)	Pearson Correlation	,250	,443	,123	,165	,208	,292
	Sig. (2-tailed)	,008	,000	,196	,083	,028	,002
	N	112	112	112	112	112	112
Interpersonal (behaviour)	Pearson Correlation	,210	,386	,299	,128	,205	,558
	Sig. (2-tailed)	,026	,000	,001	,178	,030	,000
	N	112	112	112	112	112	112

CONCLUSIONS

› **Psychometric quality of MIA**:

  › Fairly good. some revisions were necessary. Two dimensions of adaptive behavior (*unpredictable, learning*) are of a different type than others.

  › They also had lower psychometric qualities: therefore deleted.

› **Differentiation of MIA between jobs**:

  › Fairly good for most dimensions, especially the more reliable ones.

  › This suggest that MIA can be used to define profiles of adaptive behaviours required for a particular type of job/function

FUTURE RESEARCH

› **Military participants** (september 2015)

> › Determinants (e.g. NEO) of adaptive behaviors (MIA)

> › Self-assessment on adaptive behaviours (MIA)

> › Distinction of MIA for a high variety of job types:

	Operational	Supportive	Service
Staff level	1	2	3
Executive level	4	5	6