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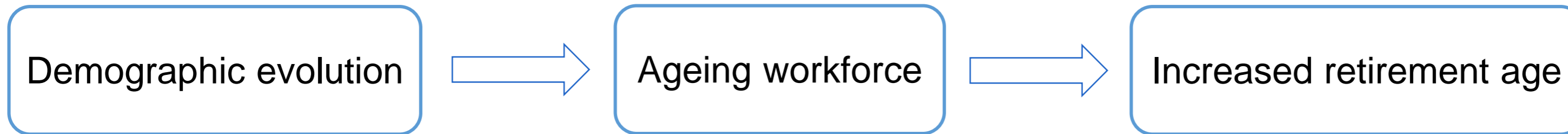
# WORK ABILITY IN NURSING:

# THE ROLE OF RELATIVE HEART RATE RESERVE AND WORK-RELATED STRESS

Employability in the 21<sup>st</sup> century  
Esther Van Poel

# OVERVIEW

- Introduction
- Methods
- Results
- Discussion
- Conclusion
- References



**Feasibility of nursing?**

- Already at higher risk for:
  - cardiovascular diseases Allesøe et al., 2015
  - reduced work ability
  - ...

## Work ability:

personal resources to cope with the work demands  
Ilmarinen, 2009; Ilmarinen et al., 1991

## Work Ability Index (WAI) Work Ability Score (WAS):

Subjective perception of work ability  
Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tulkki, 1998;  
Kinnunen & Nätti, 2017

- Predictor of ageing Monteiro, de santana Pi Chillida, & Moreno, 2012
- work-related stress Golubic, Milosevic, Knezevic. & Mustajbegovic, 2009

Inverse association between both in males Gupta et al., 2014

## Relative heart rate reserve (%HRR):

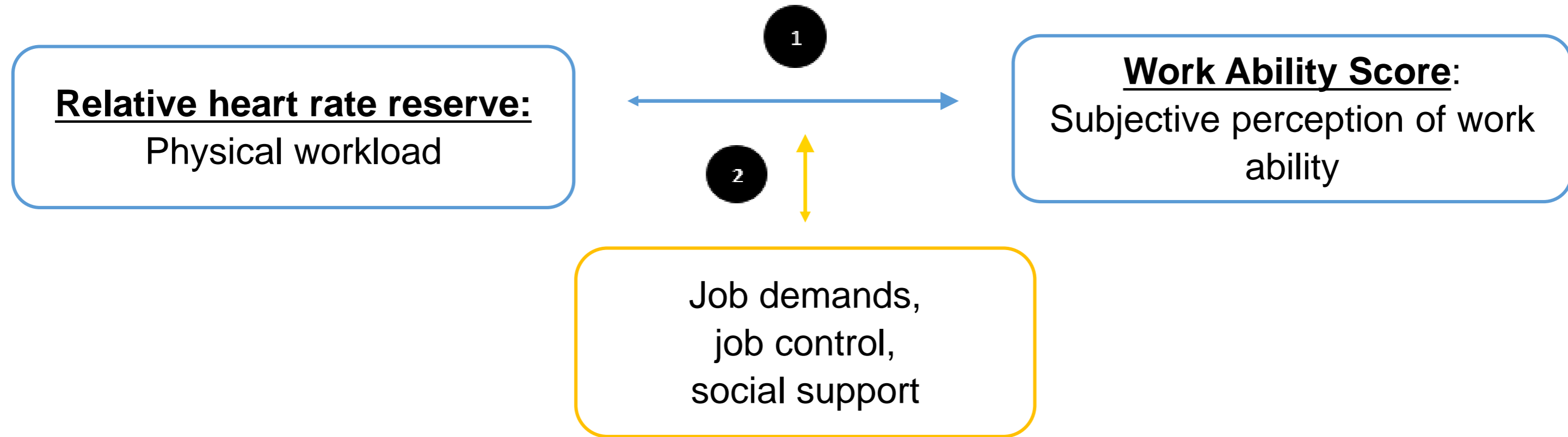
physical workload  
Karvonen & Vuorimaa, 1988

$$[(HR_{work} - HR_{min}) \div (HR_{max} - HR_{min})] \times 100$$

- Measure for the cardiovascular load: positive association
- 8 work hours/day: cut-off 33%  
Rodgers, Kenworth, & Eggleton, 1986

# BACKGROUND: PSYCHOSOCIAL WORK ENVIRONMENT



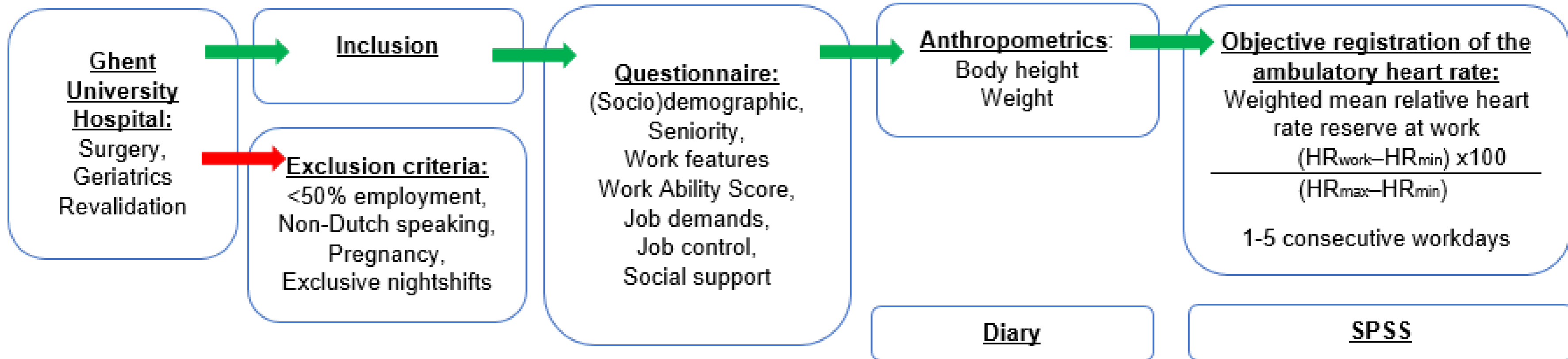


**Hypothesis 1** Inverse association between both: high %HRR ► poor WAS

**Hypothesis 2** Work stressors are moderators in this inverse association

# METHODS

## PARTICIPANTS AND TEST PROCEDURE





# RESULTS

## DESCRIPTIVE STATISTICS

Characteristic	Total (n=83)	Males (n=15)	Females (n=68)	P
<b>Age: years</b>				0.26
Median (IQR)	37.0 (27.9- 49.6)	33.9 (27.7- 40.5)	37.9 (28.1- 50.6)	
<b>Seniority: n(%)</b>				0.22
Maximal 5 years	26 (31.3)	7 (46.7)	19 (27.9)	
More than 5 years	57 (68.7)	8 (53.3)	49 (72.1)	
<b>Work schedule: n(%)</b>				1.00
Day work	8 (9.6)	1 (6.7)	7 (10.3)	
Shift work	75 (90.4)	14 (93.3)	61 (89.7)	
<b>Workhours per week</b>				0.69
Median (IQR)	40 (35-40)	40 (33-40)	40 (38-40)	
<b>Body mass index:</b>				0.91
Median (IQR)	24.1 (21.9–27.0)	23.9 (21.7–27.6)	24.2 (21.9–26.4)	
<b>Current smoker: n(%)</b>				1.00
Yes	15 (18.1)	3 (20.0)	12 (17.6)	
No	68 (81.9)	12 (80.0)	56 (82.4)	

IQR= inter-quartile range

# RESULTS

## DESCRIPTIVE STATISTICS

Characteristic	Total (n=83)	Males (n=15)	Females (n=68)	P
<b>Work Ability Score</b>				
Median (IQR)	8.0 (8.0–9.0)	8.5 (8.0–9.0)	8.2 (8.0–9.0)	0.33
Low (<8.0): n(%)	19 (22.9)	3 (20.0)	16 (23.5)	
High (≤8.0): n(%)	64 (77.1)	12 (80.0)	52 (76.5)	
<b>Relative heart rate reserve</b>				
Median (IQR)	29.2 (23.2–34.0)	29.8 (19.2–35.2)	28.8 (23.3–34.0)	0.92
Low (≤33%): n(%)	59 (71.1)	11 (73.3)	48 (70.6)	
High (>33%): n(%)	24 (28.9)	4 (26.7)	20 (29.4)	
<b>Job demands</b>				
Median (IQR)	12 (11–13)	12 (11–14)	12 (11–13)	0.35
<b>Job control</b>				
Median (IQR)	26 (25–28)	27 (26–29)	26 (25–28)	0.16
<b>Social support</b>				
Median (IQR)	24 (23–27)	24 (23–35)	24 (22–27)	0.98

# RESULTS

## SPEARMAN CORRELATION

- Significant associations:
  - WAS and job control or social support: positive
  - Job control and social support: positive
  - Age and %HRR or social support: negative

Parameter:	Spearman correlation coefficient (r)					
Total	a	b	c	d	e	f
Work Ability Score (a)	-					
Relative heart rate reserve (b)	0.08	-				
Job demands (c)	0.18	-0.18	-			
Job control (d)	0.22*	-0.05	0.06	-		
Social support (e)	0.24*	0.04	0.08	0.34**	-	
Age (f)	0.02	-0.25*	0.03	-0.14	-0.27*	-

\*p<0.05; \*\*p<0.01

# RESULTS

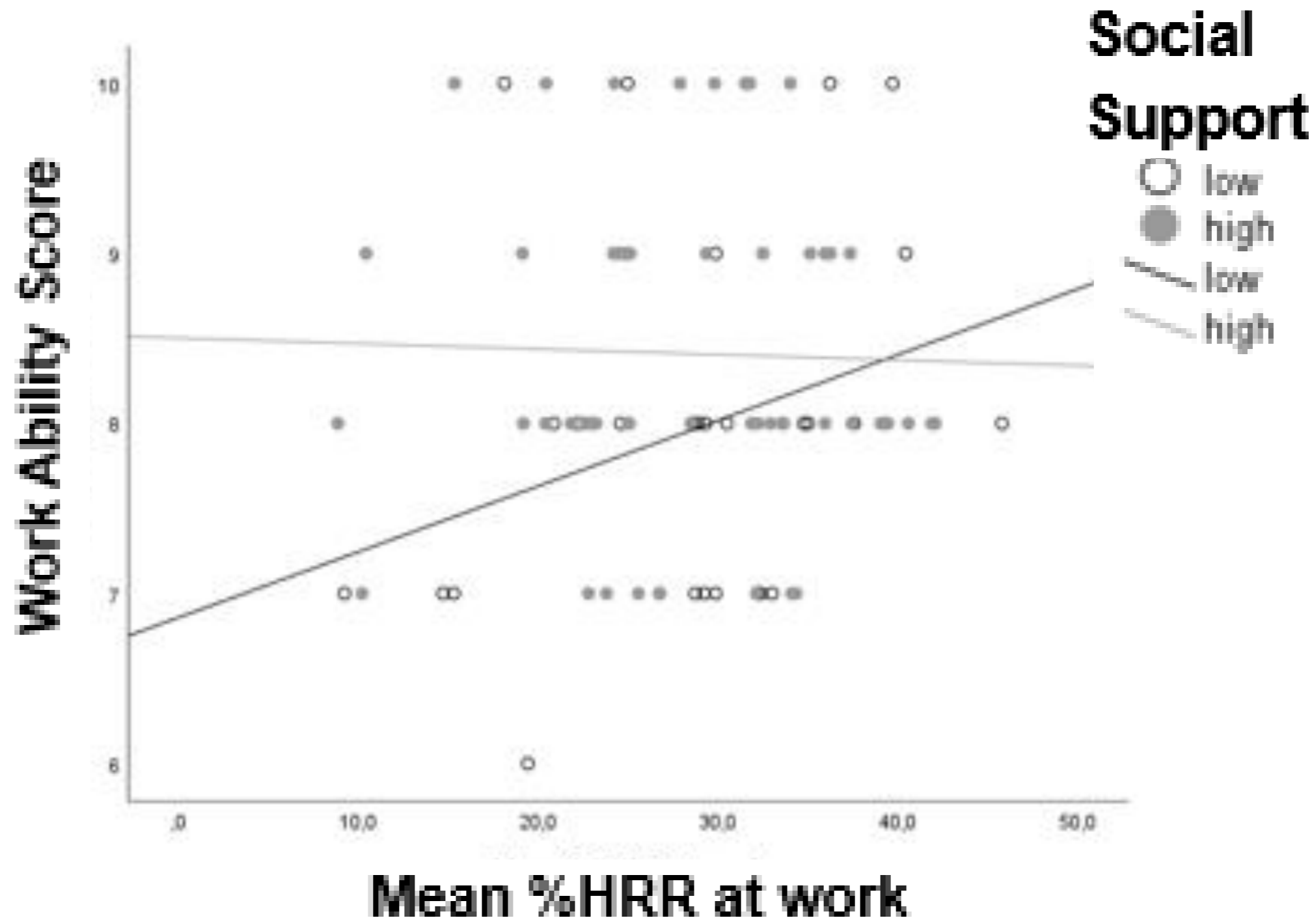
## MULTIPLE LINEAR REGRESSION

Outcome parameter: Work Ability Score Predictor:	$\beta$	T	P
<b>Model 1: Adjusted R<sup>2</sup>=0.05; F(3,79)= 2.53</b>			<b>0.06</b>
Relative heart rate reserve	0.06	0.56	0.58
Job demands	0.19	1.71	0.09
Relative heart rate reserve x job demands	0.26	2.29	<0.05
<b>Model 2: Adjusted R<sup>2</sup>=0.03; F(3,79)= 1.72</b>			<b>0.17</b>
Relative heart rate reserve	0.10	0.89	0.38
Job control	0.23	2.10	=0.05
Relative heart rate reserve x job control	-0.04	-0.33	0.74
<b>Model 3: Adjusted R<sup>2</sup>= 0.07; F(3,79)= 2.92</b>			<b>&lt;0.05</b>
Relative heart rate reserve	0.06	0.60	0.55
Social support	0.33	2.73	<0.01
Relative heart rate reserve x social support	-0.24	-2.00	=0.05

# RESULTS

## STRATIFIED ANALYSIS

- Nurses with low social support:
  - Tendency towards a positive association between %HRR and WAS ( $p=0.09$ )

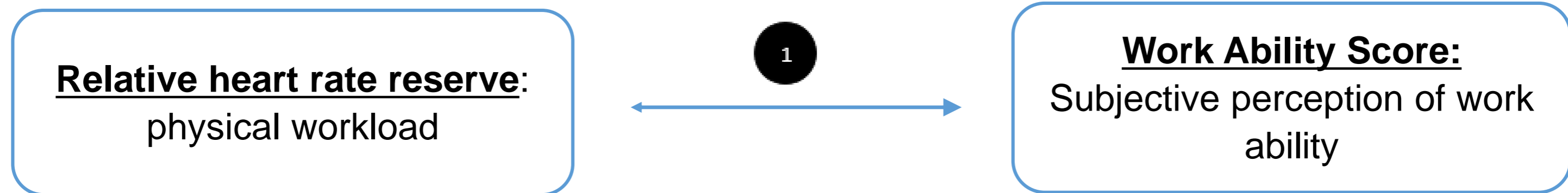


## DISCUSSION

- No significant difference between both genders:
  - Work Ability Score
    - ≠ Rotenberg et al., 2008: WAS males > females
    - Due to different roles in the society? Strandiz and Bammer, 2004
  - Relative heart rate reserve
    - ≈ Korshøj et al., 2016
  - Job demands, job control and social support
    - ≈ Evans and Steptoe, 2002

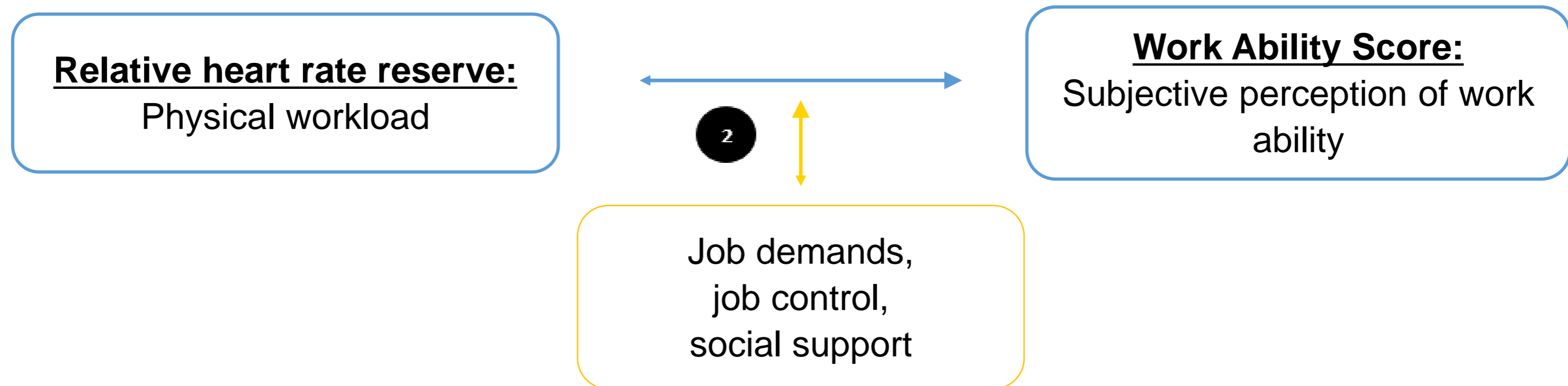
**Hypothesis 1 was not confirmed**

- No significant association between %HRR and WAS
  - Due to female predominance? Gupta et al., 2014
- WAS positively correlated to job control and social support
  - Confirmation of the influence of work-related stress on work ability Clays et al., 2016



**Hypothesis 2 was not confirmed**

- No clear moderation effects
- Nurses with low social support:
  - A tendency towards a positive association between %HRR and WAS
    - Advanced tailoring in female-occupied professions? Gupta et al., 2014
    - The healthy worker effect?





+ Multi-dimensional approach

- Cross-sectional design
- Confounding factors Camerino et al., 2006
- Size and composition of the test group
- ...

Pilot study



Verify current statements



Extensive test group

## CONCLUSION

- No significant differences between both genders for:
  - WAS, %HRR, job demands, job control or social support
- No clear conclusions about moderation effects
- Nurses with low social support
  - A tendency towards a positive association between %HRR and WAS
- The importance of involving the psychosocial work environment
  - Significant association between WAS and job control or social support

QUESTIONS?

THANK YOU FOR LISTENING

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