



Quality of Life Technologies Lab
University of Geneva (CH) & University of Copenhagen (DK)
qualityoflifetechnologies.org



Active Living & Assistive Technologies

Prof. Dr. Katarzyna Wac

AGE NT Conference, March 2021



UNIVERSITÉ
DE GENÈVE

UNIVERSITY OF
COPENHAGEN



STANFORD
SCHOOL OF MEDICINE

Stanford University Medical Center



EUROPEAN
SCIENCE
FOUNDATION



EUROPEAN
COMMISSION



HORIZON 2020



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra



FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION



Research
at Google

A Senior (female, 69)

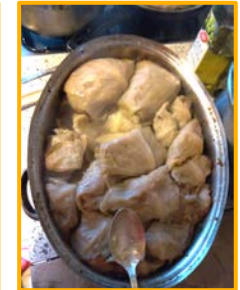
Type 2 Diabetes (1992)

Heart attack (2014)

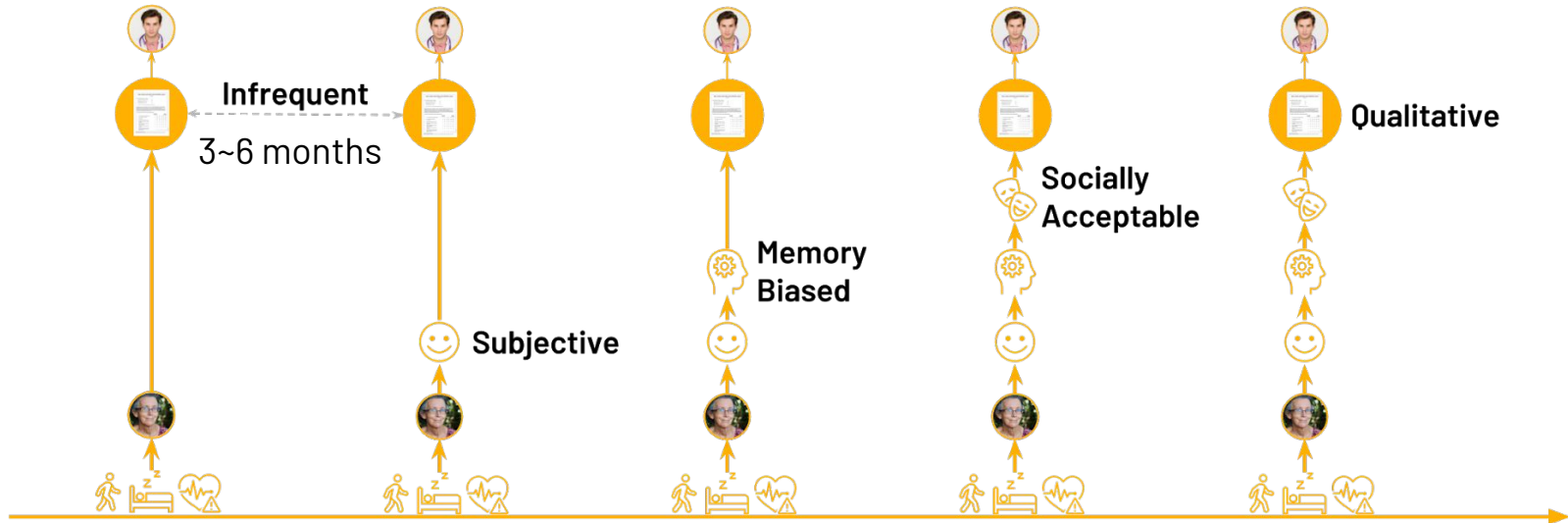
Hip fracture & replacement (2016)

Loves cooking

Much (too much) food (carbs)



Currently...



The Big Picture



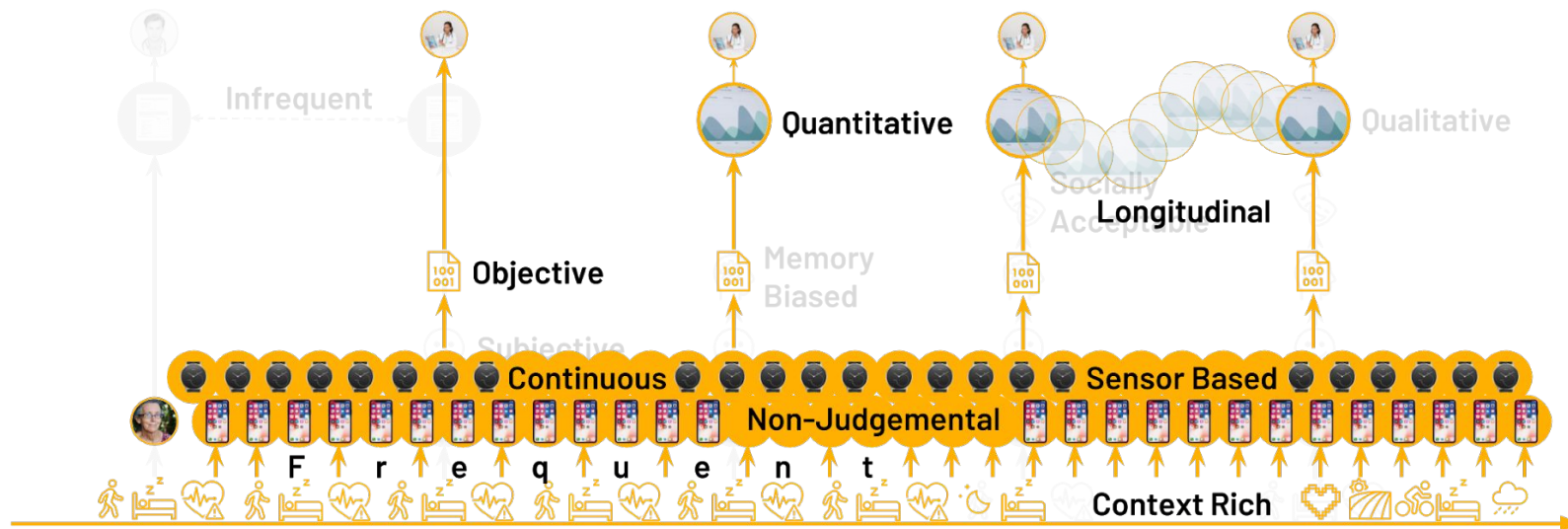
Smartphone & Wearables



88%
of the time
next to us



Future...



S169

69yo, female, HU
disease (HTN)

2018



Infrequent

mid-2018



Nutrition: 7
PSQI: 15
MSPSS: 5
GADS: 68
EQ5D-health: 80

steps: 8035
active: 300 min
sleep: 7h06m

Memory
Biased

winter
2018/2019



Nutrition: 5
PSQI: 15
MSPSS: 5
GADS: 51
EQ5D-health: 75

steps: 6760
active: 273 min
sleep: 8h08m

Socially
Acceptable

mid-2019



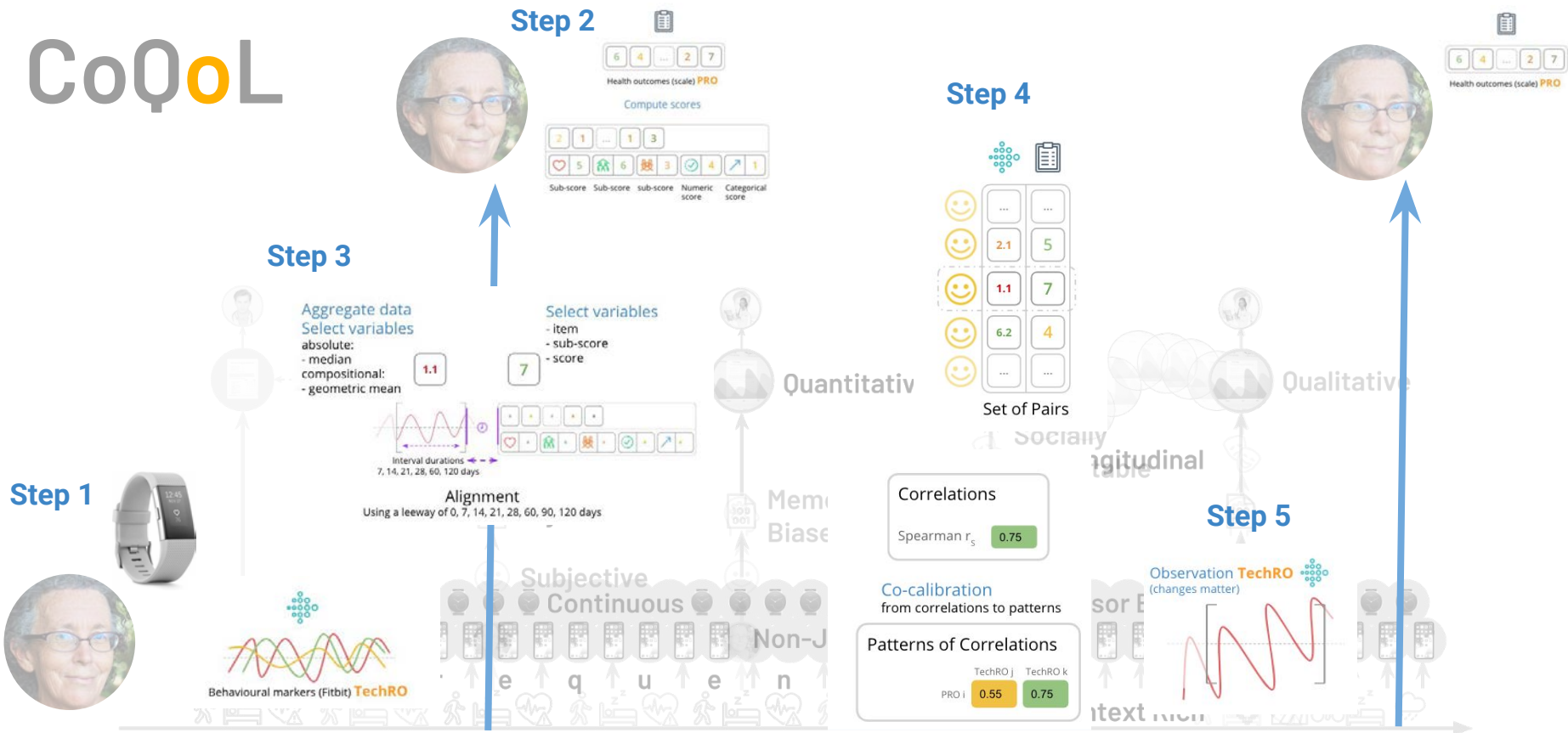
Nutrition: 7
PSQI: 14
MSPSS: 5
GADS: 47
EQ5D-health: 80

steps: 8172
active: 294 min
sleep: 7h03m

Qualitative



CoQoL



Human Factors:

What about the Individual?



Human Factors

Q: Do you use technologies (smartphone/wearable) for your own health/care?

I don't!

I don't mix my smartphone with my health [visibly angry]
It's all in here [indicating own head]
I do not want a phone reminds me about my disease
I have got a [fitbit as a] gift and I dropped it

I would...

Privacy is an issue
It's complicated, I don't know how to use it, I am not a techie
It's inaccurate: I have compared [fitbit] to my husband's Garmin
and I was disappointed" [and have dropped it]

Study details

N = 200 participants (US)

Affinity clustering of significant factors

I do...



Interface design

Too complex!
Passwords
Notifications



Performance

Slow!
No sync
Malfunctioning
Internet is touchy



Battery

Too short
Carry 2 batteries
Walked for free!



Social Sharing

I have enough people
judging me offline
Doctor won't trust it



Accuracy

Not a medical accuracy
Accurate enough to
recognize my efforts



Emotions

Keeps me entertained
I hate it when gained weight
I get addicted



Cost

Smartphone is a basis
Wearables: Too Costly!



Self-Efficacy

I like to see my progress
I try harder
I can always walk tomorrow



Routines

For me when I need it
Non-routine events most
critical



coQoL

Can it Work?

Maybe.

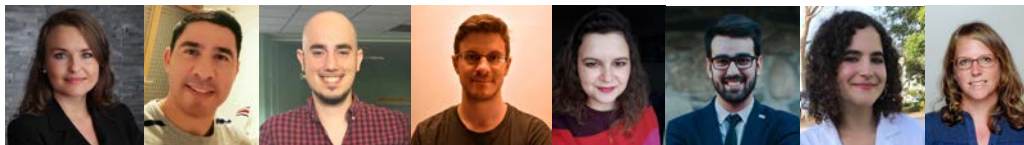




Quality of Life Technologies Lab
www.qol.unige.ch

European
Network of
Living Labs

...welcoming collaborations

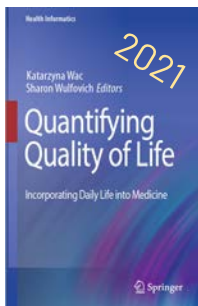


Prof. Katarzyna Wac and the QoL Team

Quality of Life, Center for Informatics, University of Geneva, Switzerland

katarzyna.wac@unige.ch

Images: unsplash.com and icons8.com



UNIVERSITÉ
DE GENÈVE

UNIVERSITY OF
COPENHAGEN



STANFORD
SCHOOL OF MEDICINE
Stanford University Medical Center



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra



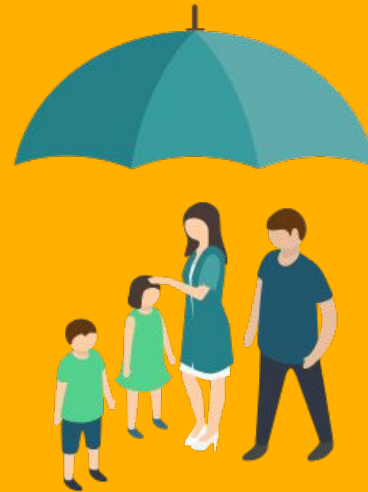
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION



Research
at Google

coQoL:

Social Support (MSPSS)



N=39, 18 healthy, 26F, 70±7yo

MSPSS: moderate vs. 2 years of TechR0 data

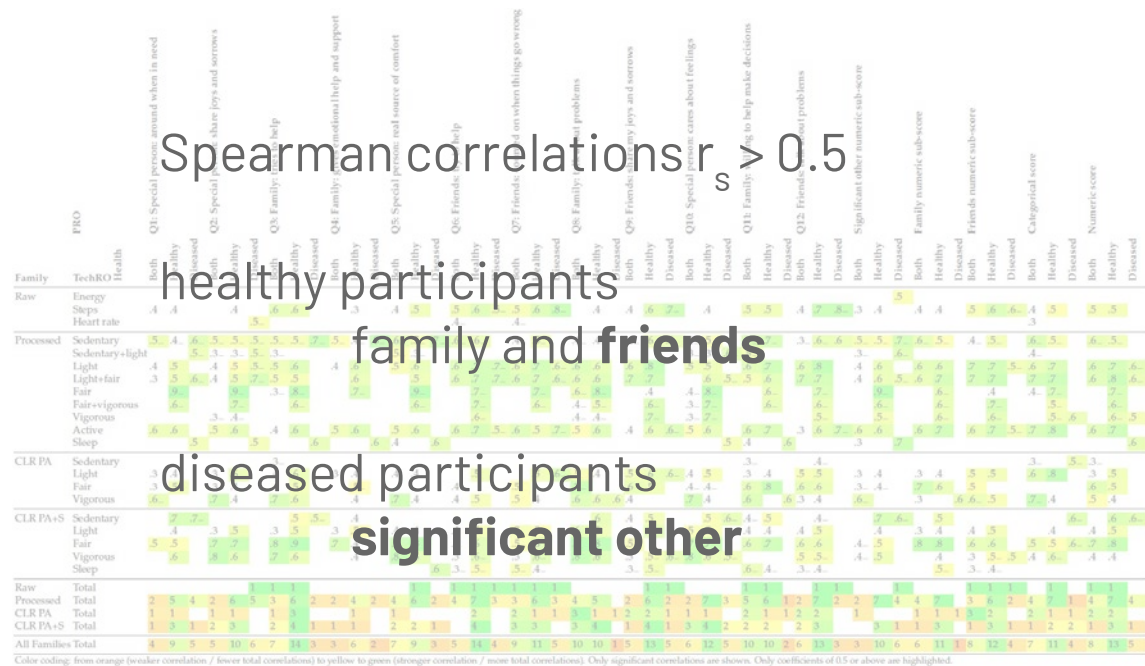
Family	Raw	TechR0	PRO	Q1: Special person: around when in need		Q2: Special person: share joys and sorrows		Q3: Family: tries to help		Q4: Family: gives emotional help and support		Q5: Special person: real source of comfort		Q6: Friends try to help		Q7: Friends: counted on when things go wrong		Q8: Family: talk about problems		Q9: Friends share my joys and sorrows		Q10: Special person: cares about feelings		Q11: Family: willing to help make decisions		Q12: Friends talk about problems		Significant other numeric sub-score		Family numeric sub-score		Friends numeric sub-score		Categorical score		Numeric score	
				Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy	Both	Healthy
Processed	Energy Steps																																				
	Heart rate																																				
	Sedentary																																				
	Sedentary+light																																				
	Light																																				
	Light+fair																																				
	Fair																																				
	Fair+vigorous																																				
	Vigorous																																				
	Active Sleep																																				
CLR PA	Sedentary																																				
	Light																																				
	Fair																																				
	Vigorous																																				
CLR PA+S	Sedentary																																				
	Light																																				
	Fair																																				
	Vigorous																																				
Raw	Total																																				
	Processed																																				
	CLR PA																																				
	CLR PA+S																																				
All Families Total																																					

Color coding: from orange (weaker correlation / fewer total correlations) to yellow to green (stronger correlation / more total correlations). Only significant correlations are shown. Only coefficients of 0.5 or above are highlighted.



N=39, 18 healthy, 26F, 70±7yo

MSPSS: moderate vs. 2 years of TechRO data



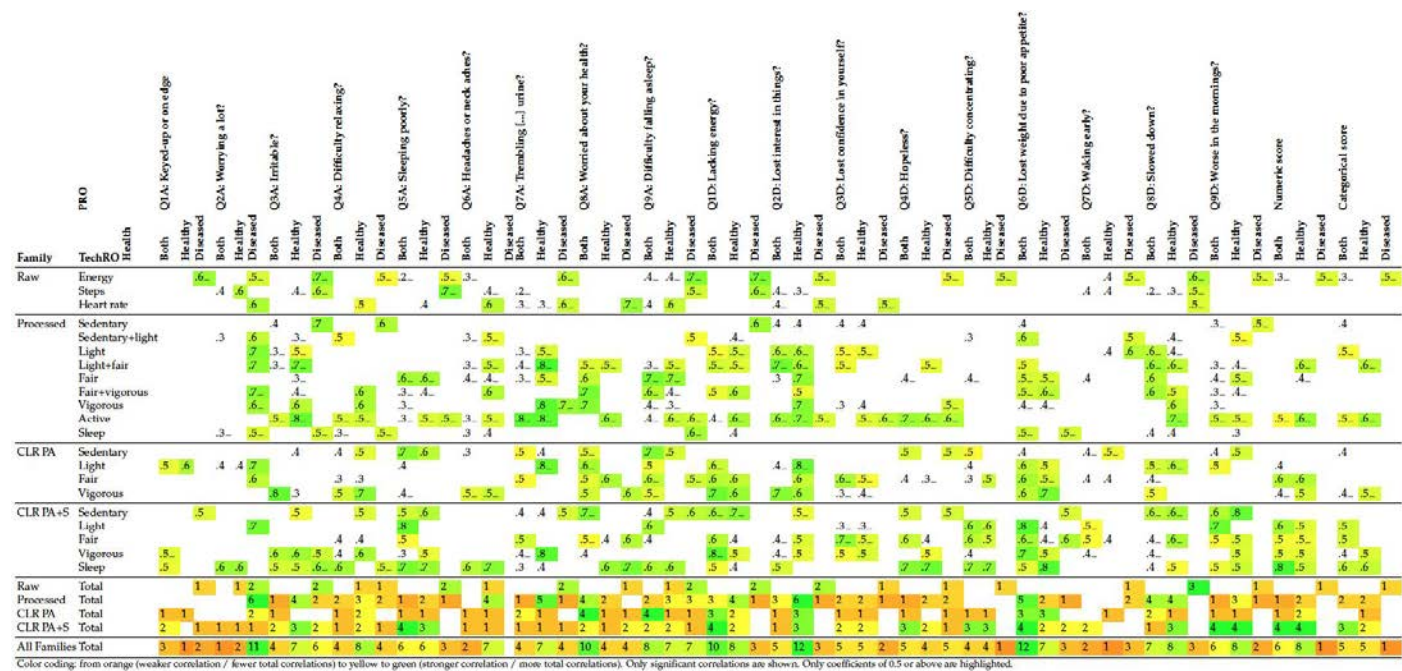
coQoL:

Negative Feelings, Anxiety (GADS)



N=39, 18 healthy, 26F, 70±7yo

GADS: possible/mild vs. 2 years of TechRO data



N=39, 18 healthy, 26F, 70±7yo

GADS: possible/mild vs. 2 years of TechRO data

