

SAMI International Workshop – Subjectivity As Matter & Instrument

– 13, 14, 17 Septembre 2018 –

Maison des Sciences de l'Homme Ange Guépin, Nantes, France

The contribution of computer science and interdisciplinarity research to Q-method

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Lemna



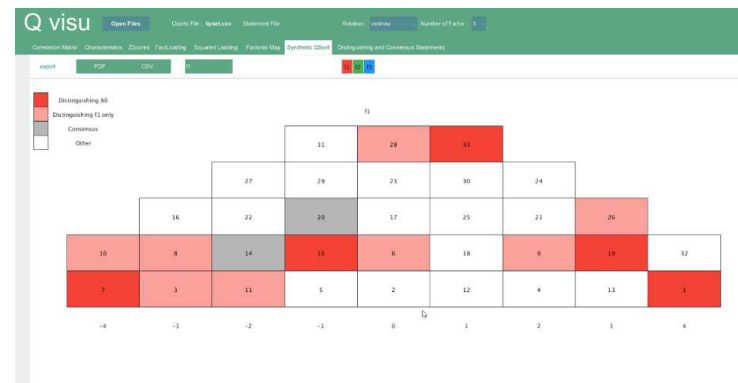
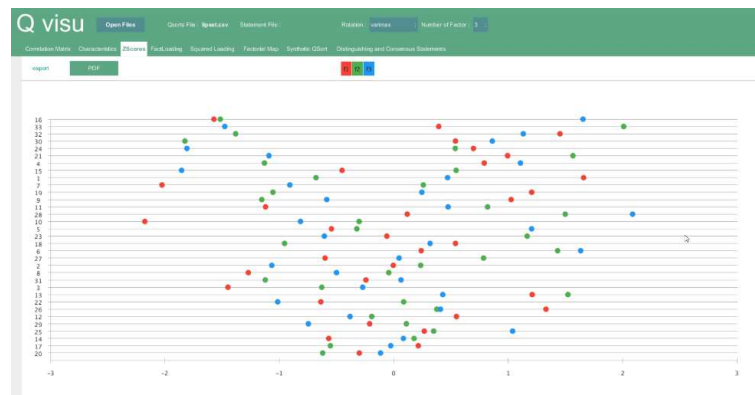
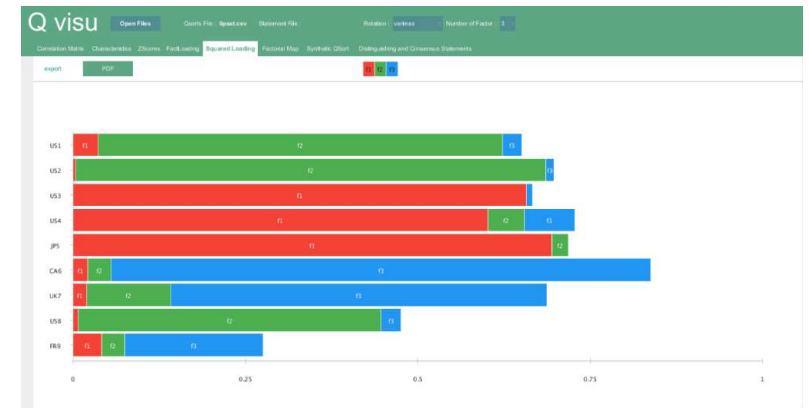
Going beyond the results ...

Q visu Open Files Qsorts File: lipset.csv Statement File: Rotation: varimax Number of Factor: 3

Correlation Matrix Characteristics ZScores Fac.Loading Squared Loading Factorial Map Synthetic QSort Distinguishing and Consensus Statements

export PDF

	Average reliability coefficient	Number of loading Q-sorts	Eigenvalues	Percentage of explained variance	Composite reliability	Standard error of factor scores	Sum of explained variance
f1	0,80	3,00	2,09	23,17	0,92	0,28	23,17
f2	0,80	3,00	1,97	21,93	0,92	0,28	45,09
f3	0,80	3,00	1,68	18,68	0,92	0,28	63,78



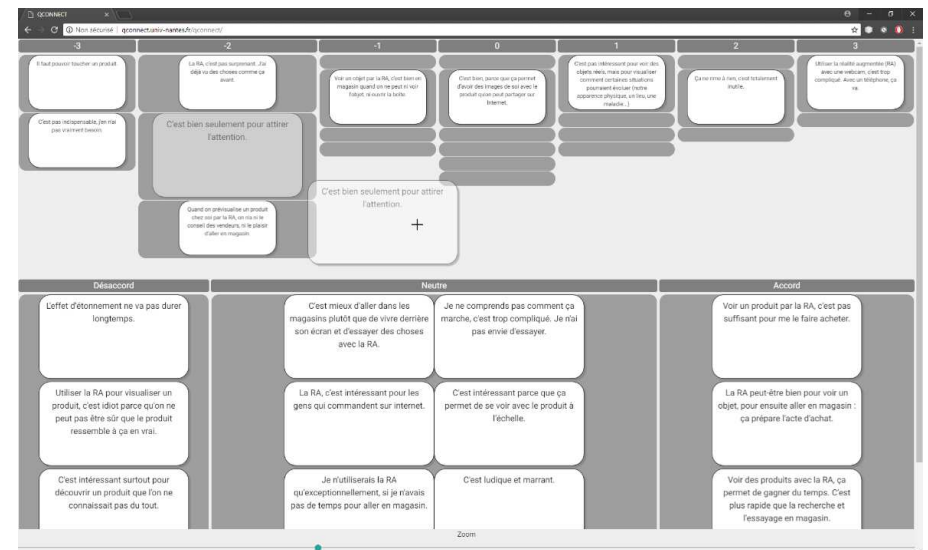
Tracking the sorting dynamics

Events :

- mouse click
- mouse move
- drag
- drop
- scrolling
- zooming
- key press
- etc ...

x-y coordinates of each move

Time of each event in milliseconds



Experimental framework

24 statements -from a study on augmented reality- (S. Gauthier thesis)

1. *Using AR with a webcam is too complicated. With a phone, it's OK.*
2. *I don't understand how it works, it's too complicated. I don't want to try.*
3. *AR is not surprising. I've already seen things like this before.*
4. *The wow-effect will not last long.*
5. *It doesn't make sense, it's absolutely useless.*
6. *It's better to go into shops than to live behind your screen and try things with AR.*
7. *I would use AR only as an exception, if I hadn't a second to spare to go into a shop.*
8. *It is not interesting in order to see real objects, but to visualize how some situations could evolve (our physical appearance, a location, an illness ...).*
9. *It's good only to draw attention. etc ...*

14 participants

Statements are randomly displayed on the screen

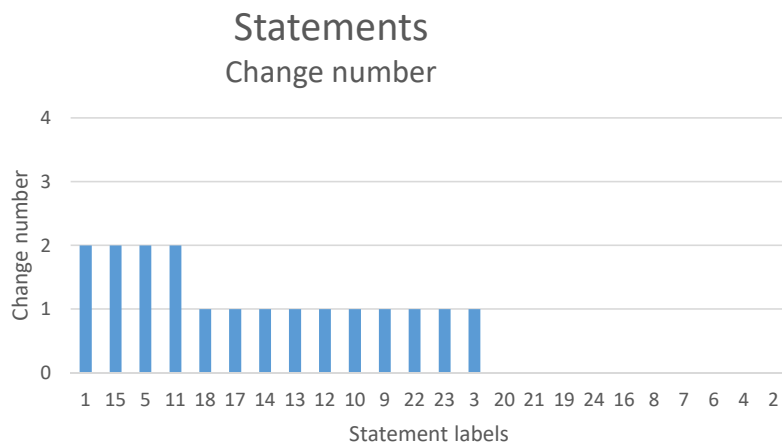
Before starting, a sheet of paper presenting the statements has been given to the participants

2 stages 3 classes: *disagree, neutral, agree*

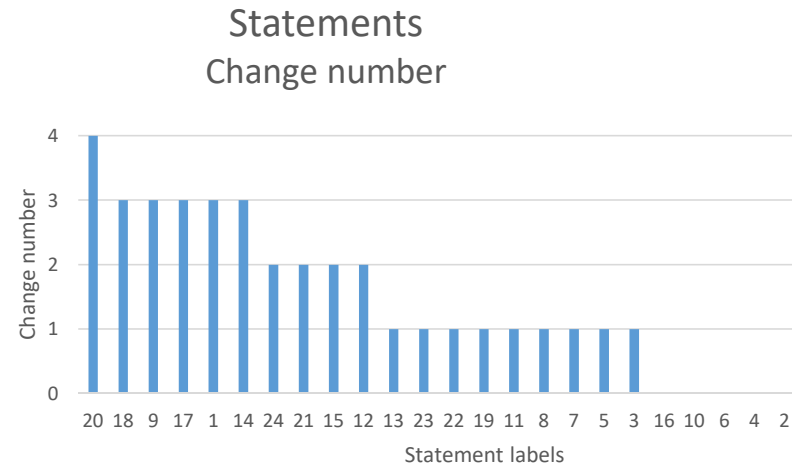
q-sort with the Gaussian distribution: from -3 « *strongly disagree* » to +3 « *strongly agree* »

Exploration of decision evolution 1

Question: are there some placement changes of the statements in each sorting stage ?



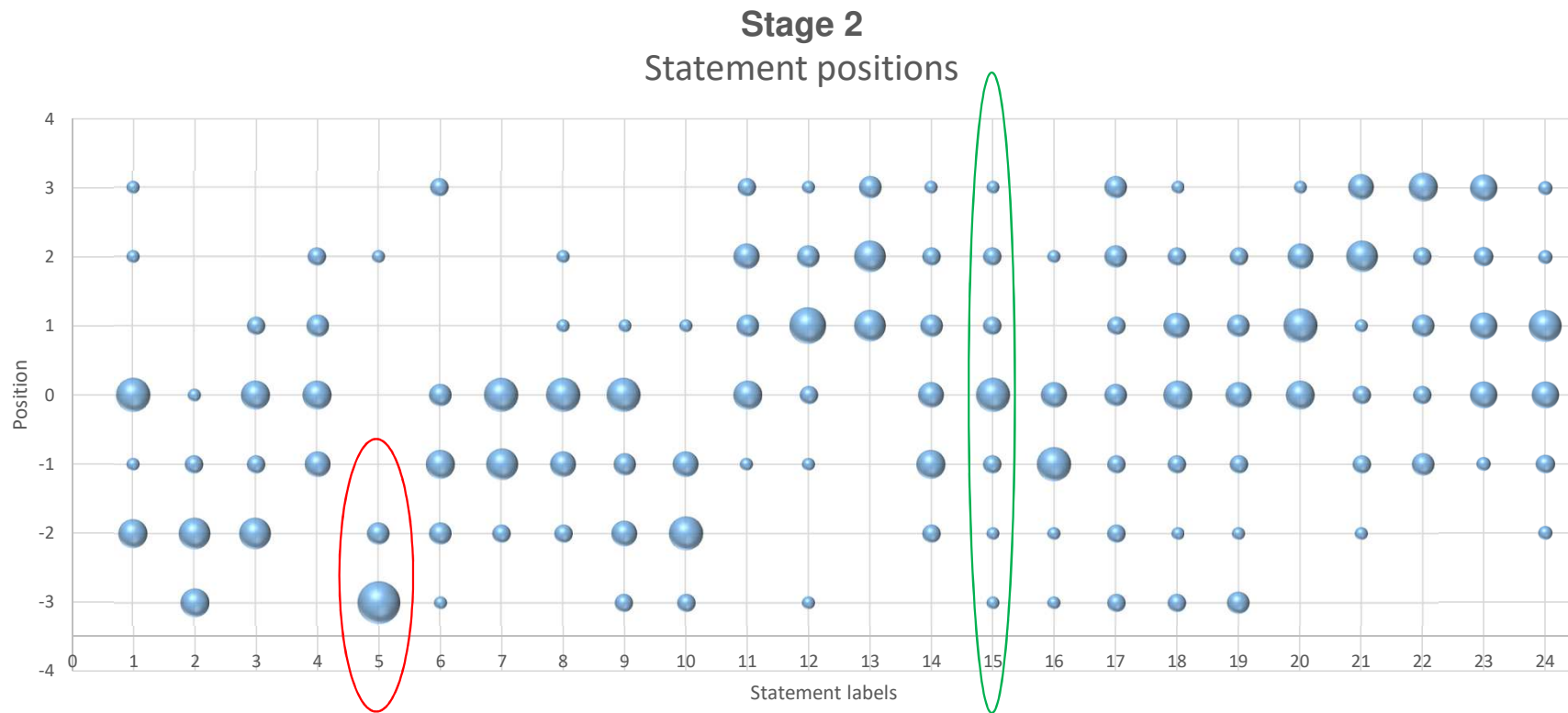
stage 1



stage 2

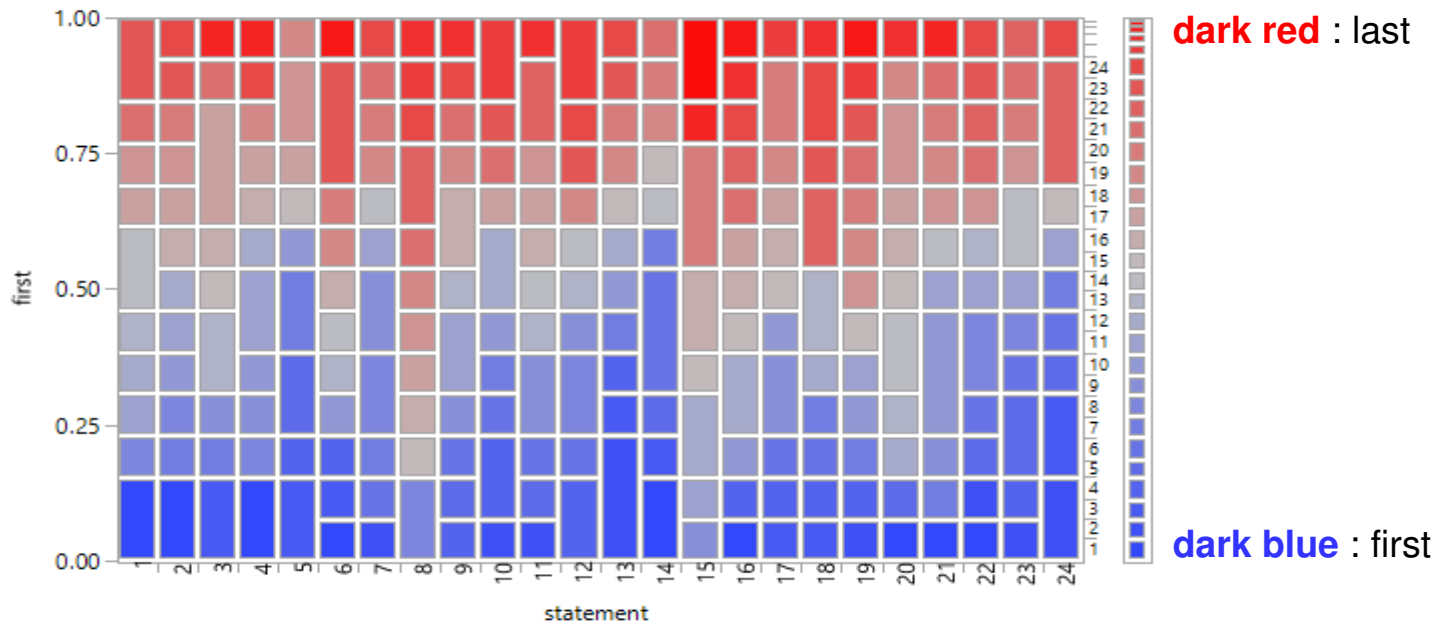
Exploration of decision evolution 2

Question: are some statement placements more « stable » than others ?

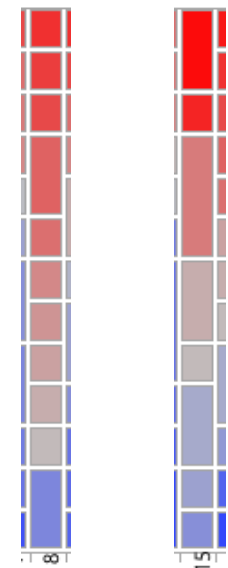


Exploration of decision evolution 3

Question: are some statements placed before others ?



stage 1



never placed first

Exploration of decision evolution 4

Question: what is the evolution of the « neglected » statements ?

8 : once placed never moved

It is not interesting in order to see real objects, but to visualize how some situations could evolve (our physical appearance, a location, an illness ...)

15 : has moved several times

When pre-visualizing a product through AR at home, one lacks the pleasure of going into a shop as well as the advice of the salesperson.

Hypothesis : « ambiguous » or double-barelled statements ?

Exploration of decision evolution 5

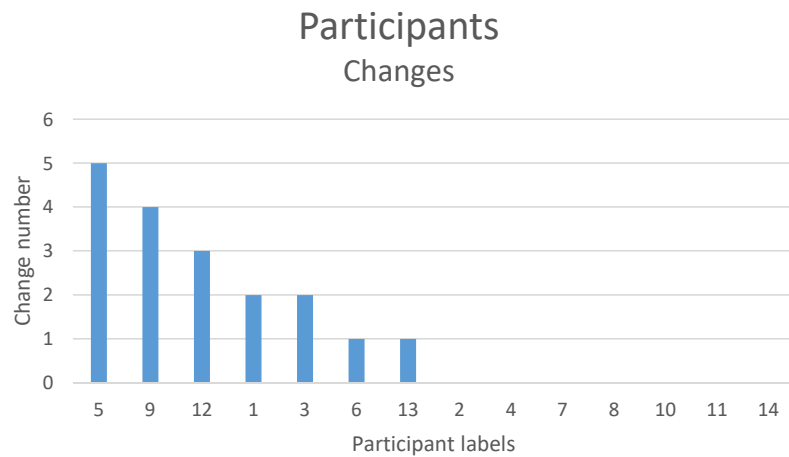
Question: what happens between stage 1 and stage 2 ?

		stage 2							Total	
		firstmove								
From		-3	-2	-1	0	1	2	3		
stage 1	disagree	Frequency	28	37	27	13	3	2	1	111
	neutral	Frequency	0	1	23	58	23	1	0	106
	agree	Frequency	0	1	0	10	23	35	26	95

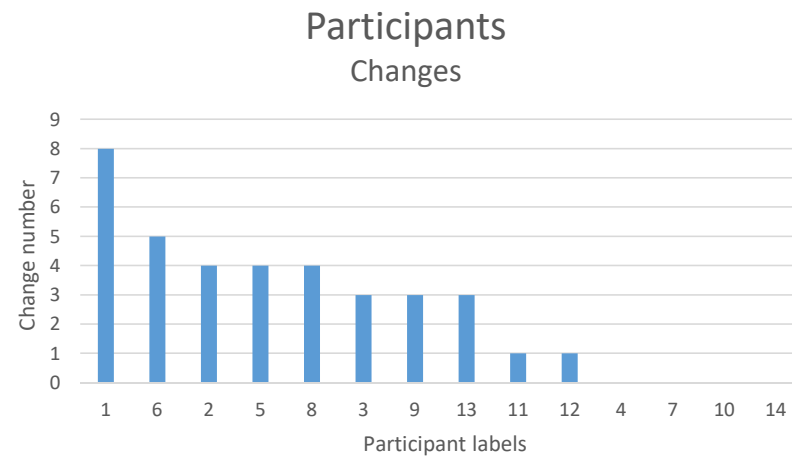
Hypothesis : the attitude is mainly built during stage 1

Exploration of participant attitudes 1

Question: are there some differences between the participants concerning the decision changes during the sorting process ?



stage 1



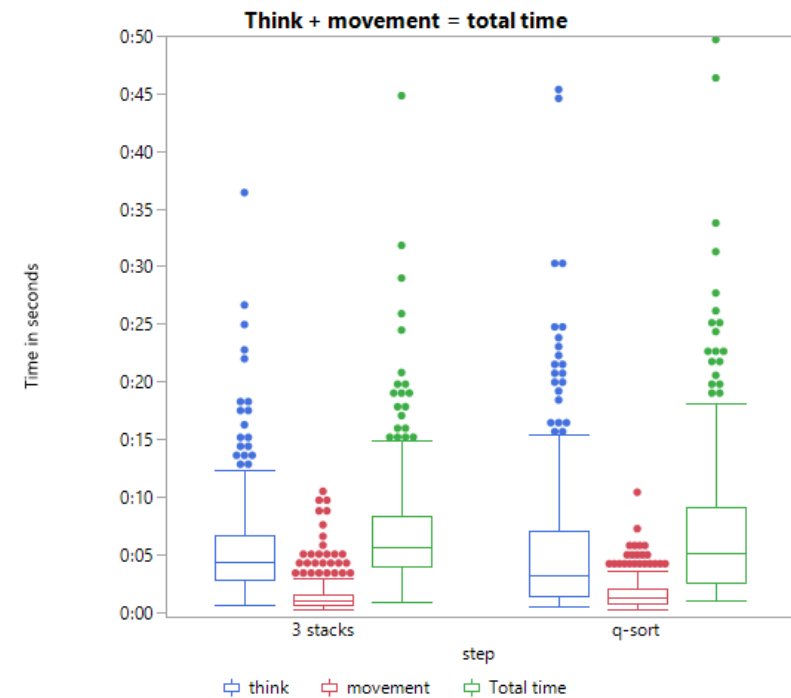
stage 2

Exploration of participant attitudes 2

Question: are there some differences between the sorting times ?

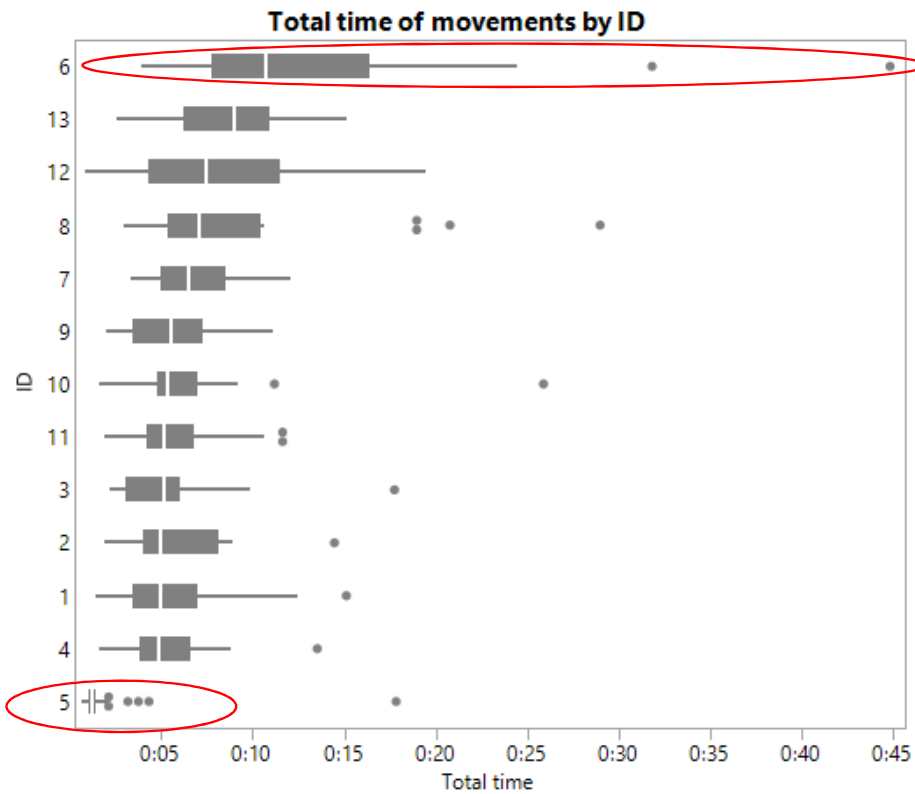
For each **displacement**:

- «reflection time »:
time measured between the last movement and the displacement start
- «displacement time »:
time measured between the displacement start and its end
- **total time**: reflection time + displacement time

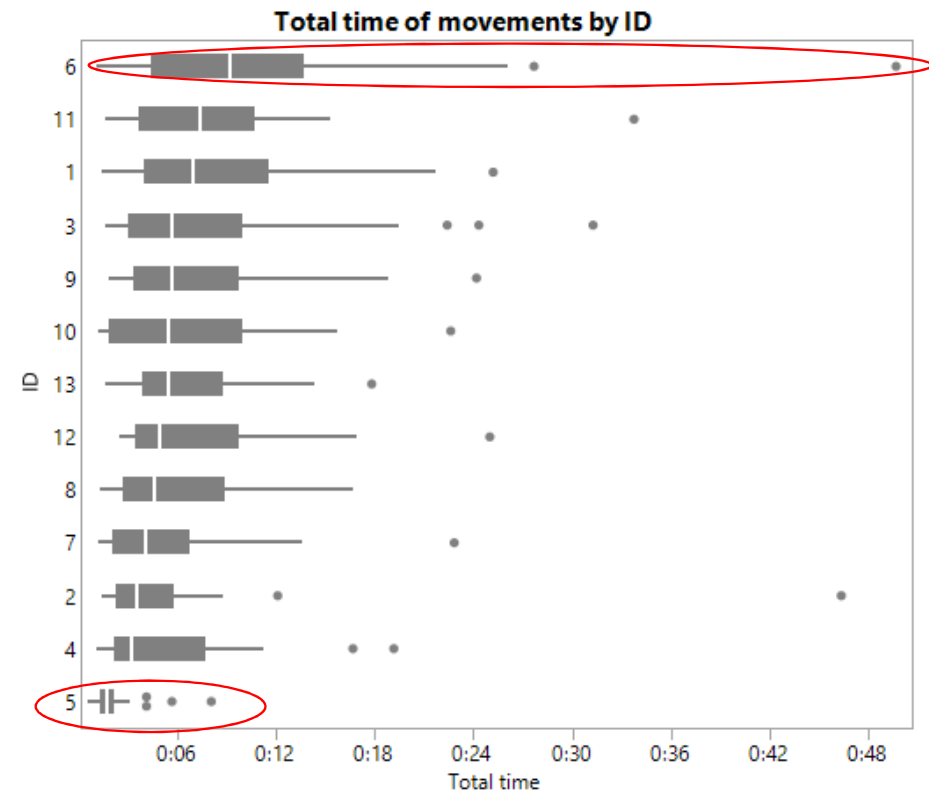


Exploration of participant attitudes 3

Question: are there some differences between the sorting times ?



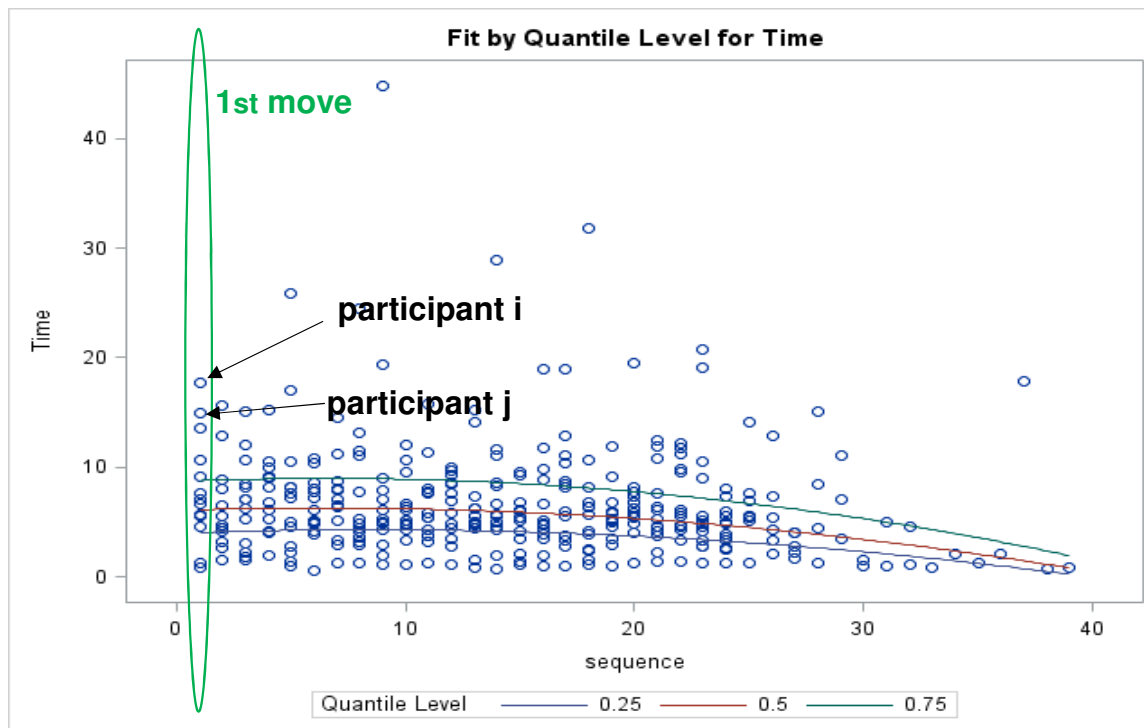
stage 1



stage 2

Exploration of participant attitudes 3

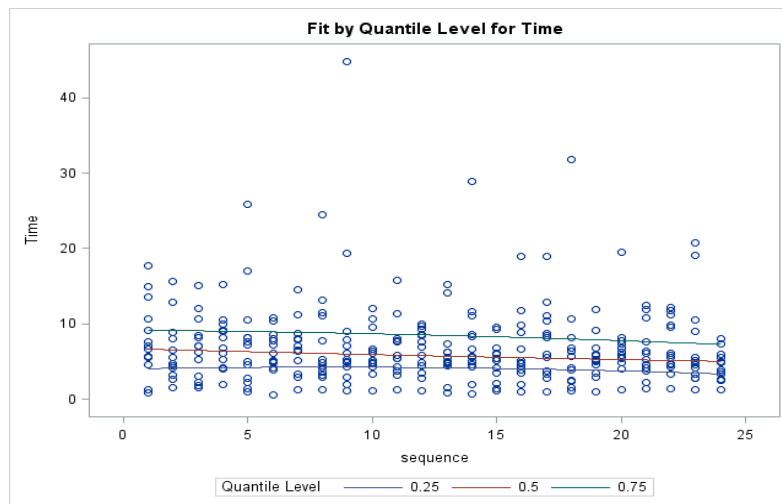
Question: how does the sorting behavior evolve ?



model : quantile regression with a polynomial of degree 2

stage 1

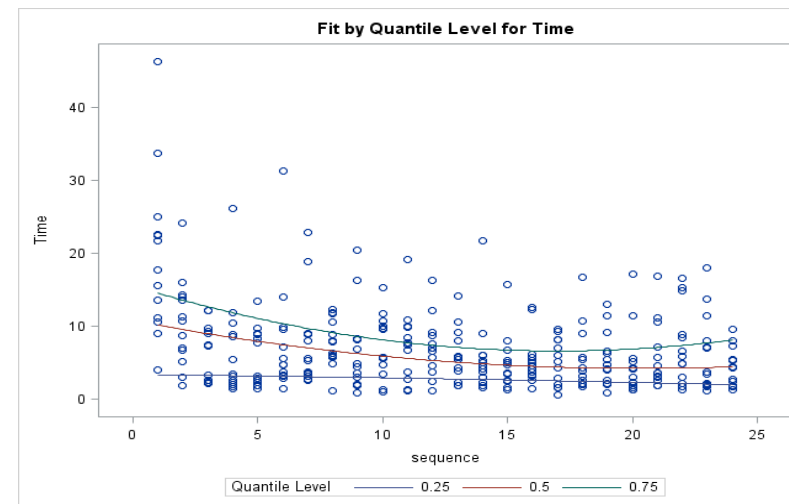
Exploration of participant attitudes 4



stage 1

median stability following
by a slight decreasing

Hypothesis: same attitude for each statement
with a slight learning of the process



stage 2

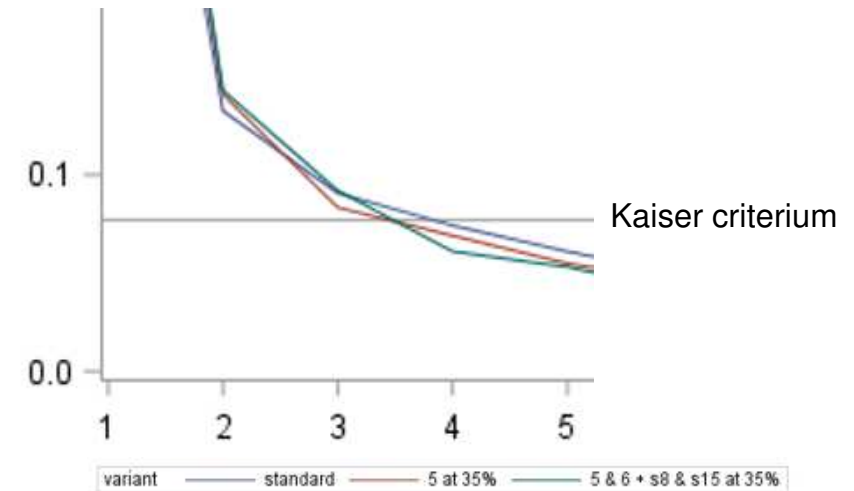
significant median decreasing

Hypothesis: discovering of the sorting constraints at
the beginning and then acceleration of the decisions
(attitude mainly built in stage 1)

Impact on the Q results 1

Proposition: adding weights in PCA to modulate the « outlier » impact (both statements & individuals)

Number	standard		5 & 6 + s8 & s15 at 35%	
	Eigenvalue	Proportion	Eigenvalue	Proportion
1	18.08	47.0%	16.66	51.7%
2	5.09	13.3%	4.61	14.3%
3	3.49	9.1%	2.97	9.2%
4	2.85	7.4%	1.97	6.1%
5	2.35	6.1%	1.71	5.3%
6	1.91	5.0%	1.31	4.1%
7	1.46	3.8%	1.22	3.8%
8	1.25	3.3%	0.68	2.1%
9	0.78	2.0%	0.40	1.2%
10	0.42	1.1%	0.32	1.0%
11	0.33	0.9%	0.22	0.7%
12	0.23	0.6%	0.13	0.4%
13	0.19	0.5%	0.06	0.2%
Total	38.43	100%	32.25	100%



3 factors with weights and 4 otherwise

Impact on the Q results 2

Comparison with random weights (here statements 5 and 14)

Eigenvalue #	eigenvalue1	% without weight	Cum % without weight	eigenvalue2	% with 65% weight	Cum % with 65% weight	eigenvalue3	% with 35% weight	Cum % with 35% weight
1	18.08	47.05%	47.05%	16.68	45.60%	45.60%	15.45	44.25%	44.25%
2	5.09	13.25%	60.30%	5.03	13.75%	59.35%	4.98	14.26%	58.51%
3	3.49	9.07%	69.36%	3.35	9.16%	68.50%	3.23	9.26%	67.77%
4	2.85	7.42%	76.79%	2.83	7.74%	76.24%	2.81	8.05%	75.82%
5	2.35	6.10%	82.89%	2.26	6.18%	82.41%	2.17	6.21%	82.03%

Further works: simulations with random selections and various weights

Impact on the Q digital protocol 1

Numerous software and on-line services

On-line

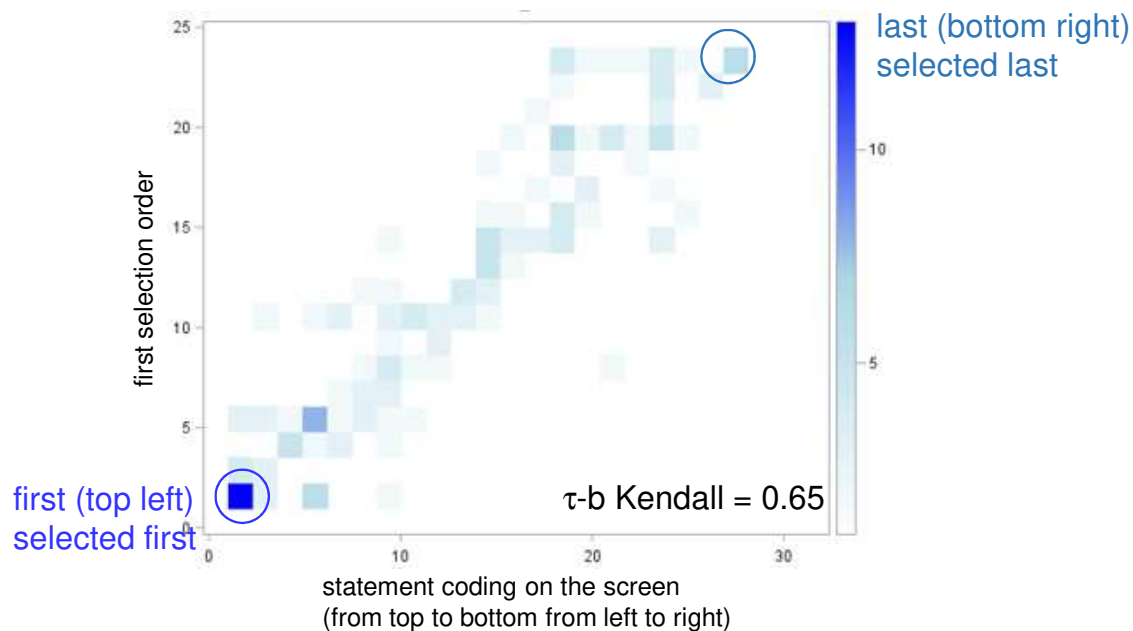
- HTML-Q
<https://github.com/aproxima/htmlq>
- qsoftware
<http://www.qsoftware.net>
- Ken-Q Data
<https://shawnbanasick.github.io/ken-q-data/index.html#section1>
- Easy-HtmlQ
https://docs.google.com/presentation/d/1fOYxQOo2XpgR1IZ4gyGO_dRi9Ehh6-0TN98us2xPEPs/edit#slide=id.p
- Ken-Q Analysis
<https://shawnbanasick.github.io/ken-q-analysis/>
- Qsortouch
<https://qsortouch.com/>
- vqmethod
<https://www.vqmethod.com/Home>
- webQ
<http://schmolck.org/qmethod/webq/>

Off-line

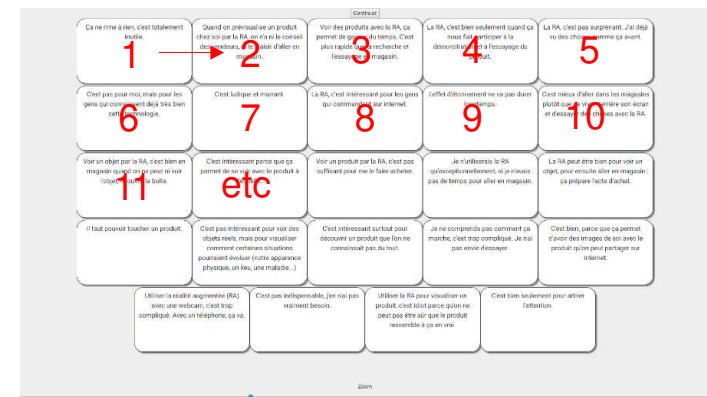
- PQMethod
<http://schmolck.org/qmethod/#PQMethod>
- PCQ
<http://www.pcqsoft.com/>
- Qmethod
<https://cran.r-project.org/web/packages/qmethod/index.html>
- FlashQ
<http://www.hackert.biz/flashq/home/>
- QFACTOR
<https://ideas.repec.org/c/boc/bocode/s458326.html>
- QCONECRT
<https://ideas.repec.org/c/boc/bocode/s458325.html>
- Attachment Q-Sorter
<http://www.aqs.stoneclearing.net/>
- Lloyd's Q Sort Tool
<http://www.nowhereroad.com/qsort/>
- rap
<http://rap.ucr.edu/qsorter/>

Impact on the Q digital protocol 2

Question: what is impact on the results of the statement order on the screen ?



stage 1



good news: no correlation between the presentation and the placements

Hypothesis: no holistic vision and consequently no significant difference between a global presentation and a statement by statement presentation

Impact on the Q protocol

Question: interpretation of -1 and +1 in the Q sorting ?

		stage 2							
		firstmove							
From		-3	-2	-1	0	1	2	3	
stage 1	disagree	Frequency	28	37	27	13	3	2	1
	neutral	Frequency	0	1	23	58	23	1	0
	agree	Frequency	0	1	0	10	23	35	26

		stage 2							
		lastmove							
from		-3	-2	-1	0	1	2	3	
stage 1	disagree	Frequency	25	37	31	12	3	2	1
	neutral	Frequency	1	0	21	57	25	2	0
	agree	Frequency	0	2	0	9	24	35	25

Hypothesis: different interpretations for the coding – impact on the analysis ?

Next future ...



New survey and new traces



Understanding the behaviors



Integrating the new informations in the Q process

Beyond ... towards « integrative human sciences »

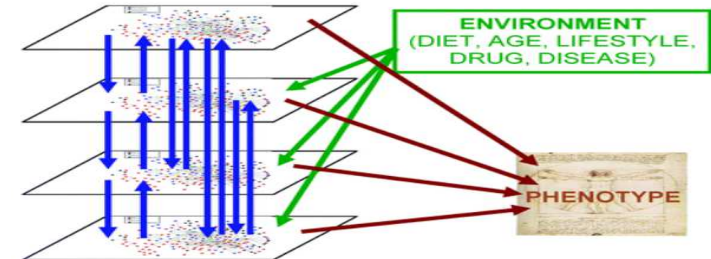
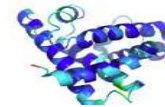
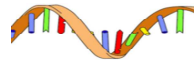
Inspiration: Integrative Biology

Geno-omics

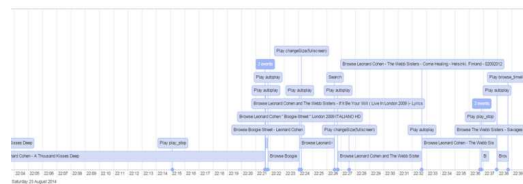
Transcript-omics

Prote-omics

Metabol-omics



- Digital traces
- Surveys
- Interviews



Project	Start	End	Status	Notes
Project A	2004	2006	Completed	Project A was completed in 2006.
Project B	2005	2007	In Progress	Project B is currently in progress.
Project C	2006	2008	On Hold	Project C has been put on hold.
Project D	2007	2009	Planned	Project D is planned for 2009.
Project E	2008	2010	Cancelled	Project E was cancelled in 2010.
Project F	2009	2011	Completed	Project F was completed in 2011.
Project G	2010	2012	In Progress	Project G is currently in progress.
Project H	2011	2013	Planned	Project H is planned for 2013.
Project I	2012	2014	On Hold	Project I has been put on hold.



Combining different scales