AGGREGATION OF DATA FROM DIFFERENT SESSIONS/EXPERIMENTS USING ANCHOR SYSTEMS

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June 2012

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AUDIO FIELD SPECIFICITY

- Usage of anchor products/points to stabilise the products space (anchor product with the lowest quality and reference with the highest)
- No problem of reproduction (in controlled environment)+ limited duration (~30s per product)

→ large experiments

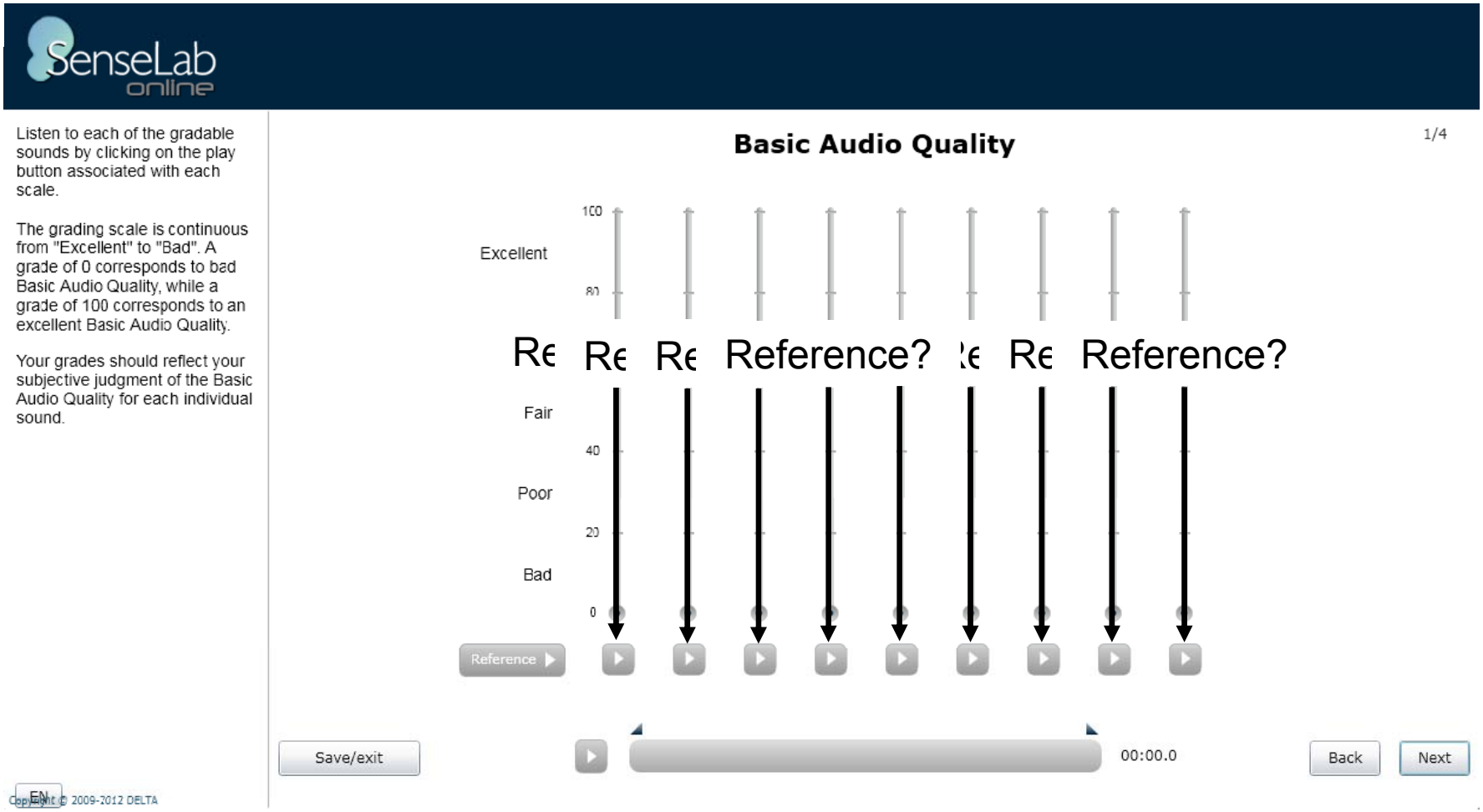
- *Absolute scales*

→ a 1 is 1 in the product space

- Screen can display max. 9 stimuli at the same time

→ split the trials in several “screens”

USER INTERFACE



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PROBLEMATIC

- Product developpment implies severall experiments using some common products (potential anchors)
- If the anchor points have been rated the same way, the product spaces are considered as similar.
- If not, the product spaces are different and we should define a common product space to compare the products from the 2 experiments.

→ how to adjust the ratings of the products from their original product space to the newly defined *reference* product space?

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METHOD

- Using only the anchor points

$$y_{ijk} = a_{ik} + b_{ik} Y_{jk} + e_{ijk} \quad [1]$$

- Where a_{ik} and b_{ik} are scaling constants to be determined from the data
- Y_{jk} is the panel average for product *j* and sample *k*.
- *a* corresponds to the difference in position of the individual assessment and the panel average.
- *b* is the difference in range/span
- a new data set is obtained by computing

$$y_{ijk}\,(new) = (y_{ijk}\,(old) - \hat{a}_{ik})/b_{ik} \quad [1]$$

[1]*"Statistics for sensory and consumer science"* T.Næs, P.B. Brockhoff and O. Tomic. P40-43

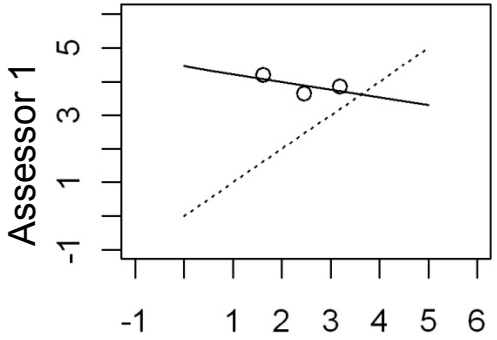
OPTIONS OF THE PRE-TREATMENT

- Number of anchor points used to do the transformation (min. 2)
- Reference product space:
  - first experiment,
  - average of the anchor points across the experiments
  - average of the anchor points across the experiments for each sample
- Level to run the pre-treatment
  - on each trial
  - averaged across the replicates or the samples)
- Normalization of the space to :
  - the original scale
  - range (using the original positions of the extreme systems)

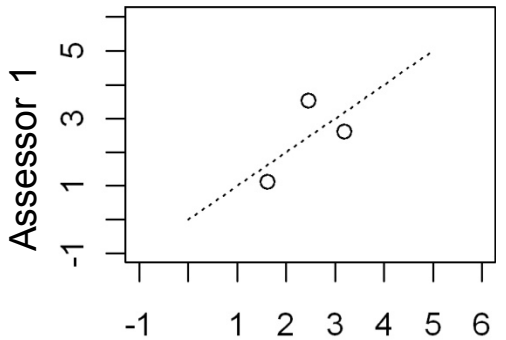
LIMITATIONS

- The anchors should have the same ranking on the scale for all the assessors,
- The anchors should be correctly discriminated.

Before transformation



After transformation



	Experiment 1	Experiment 2
Assessors	16(same+2)	14
products	7	9(3 same +6 others)
Samples	4	4(same)
Replicates	2	2

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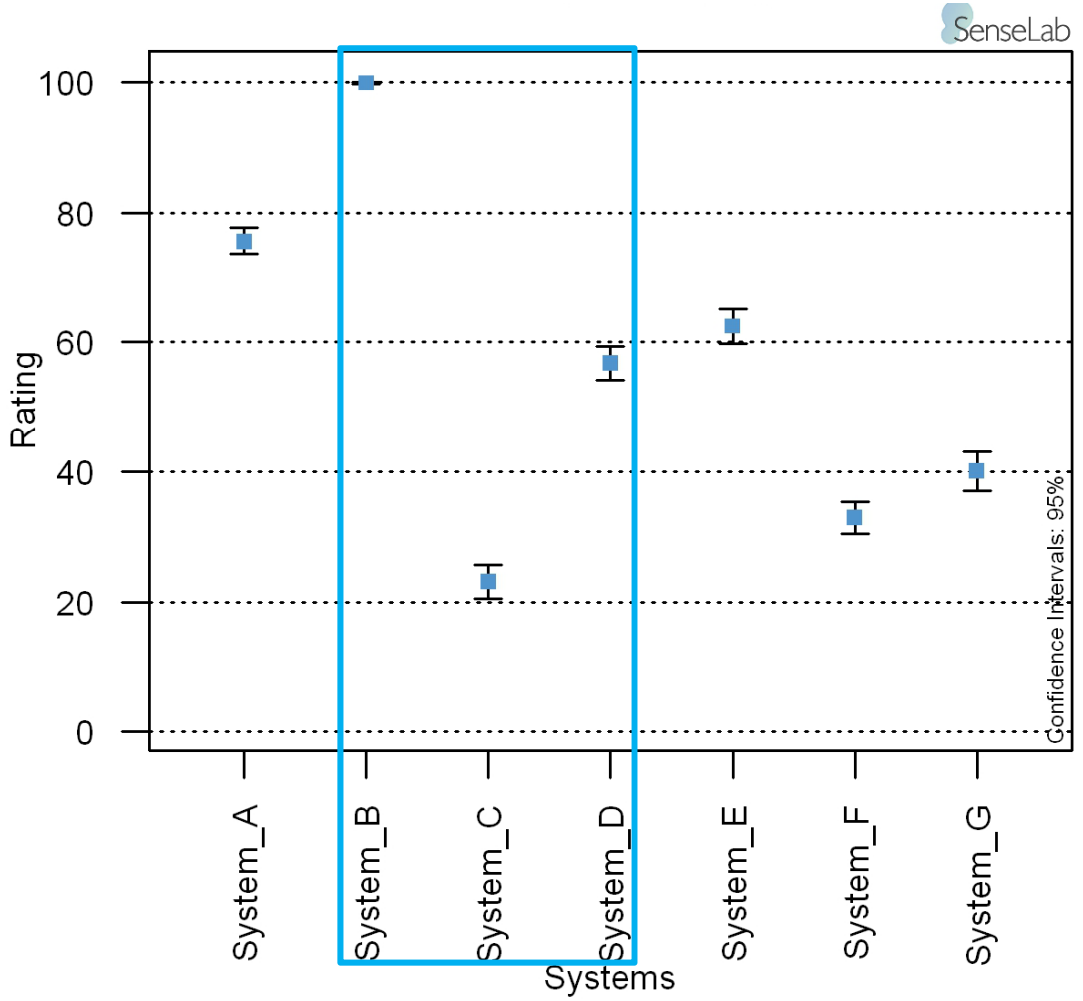
EXPERIMENT 1



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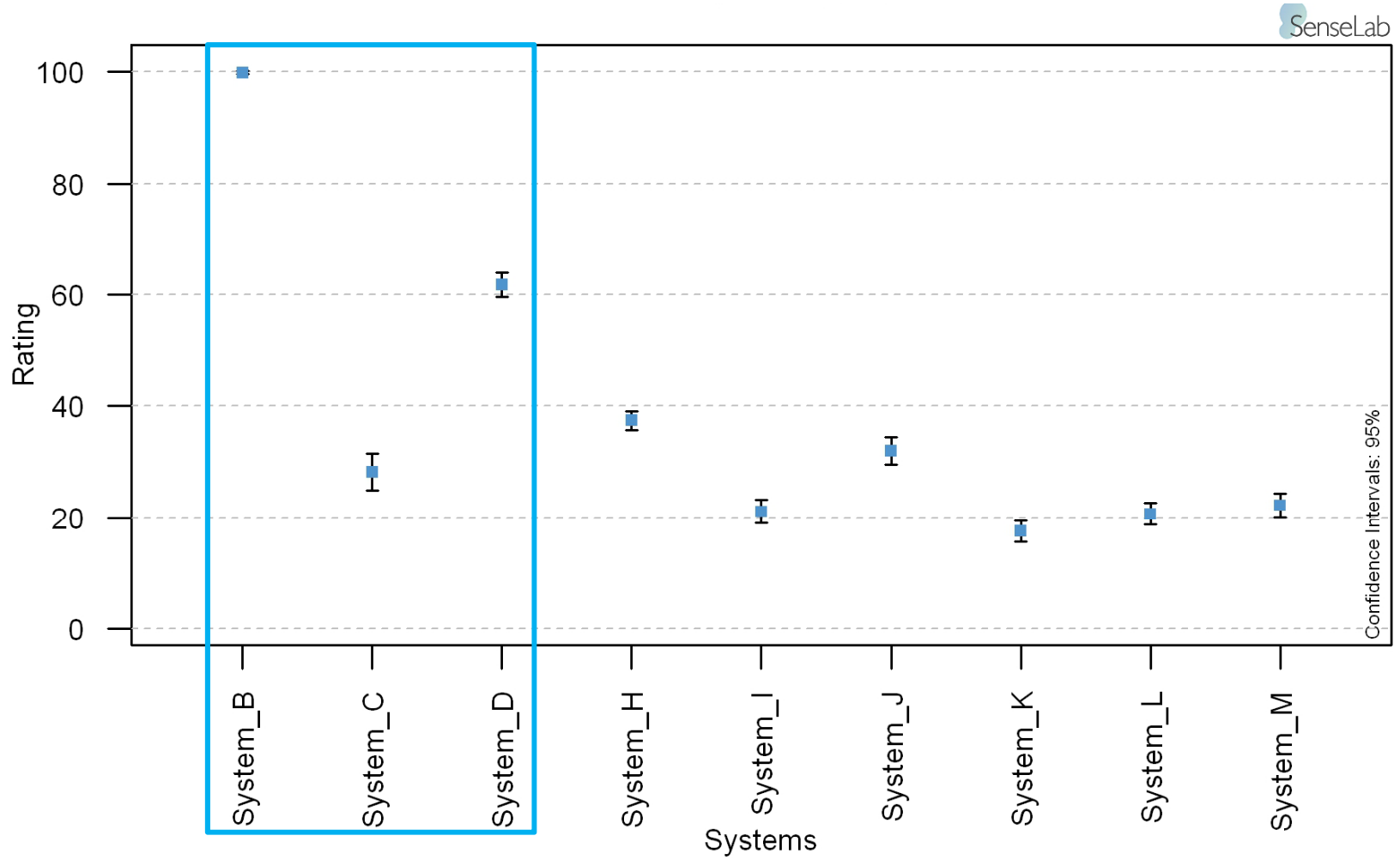
EXPERIMENT 2



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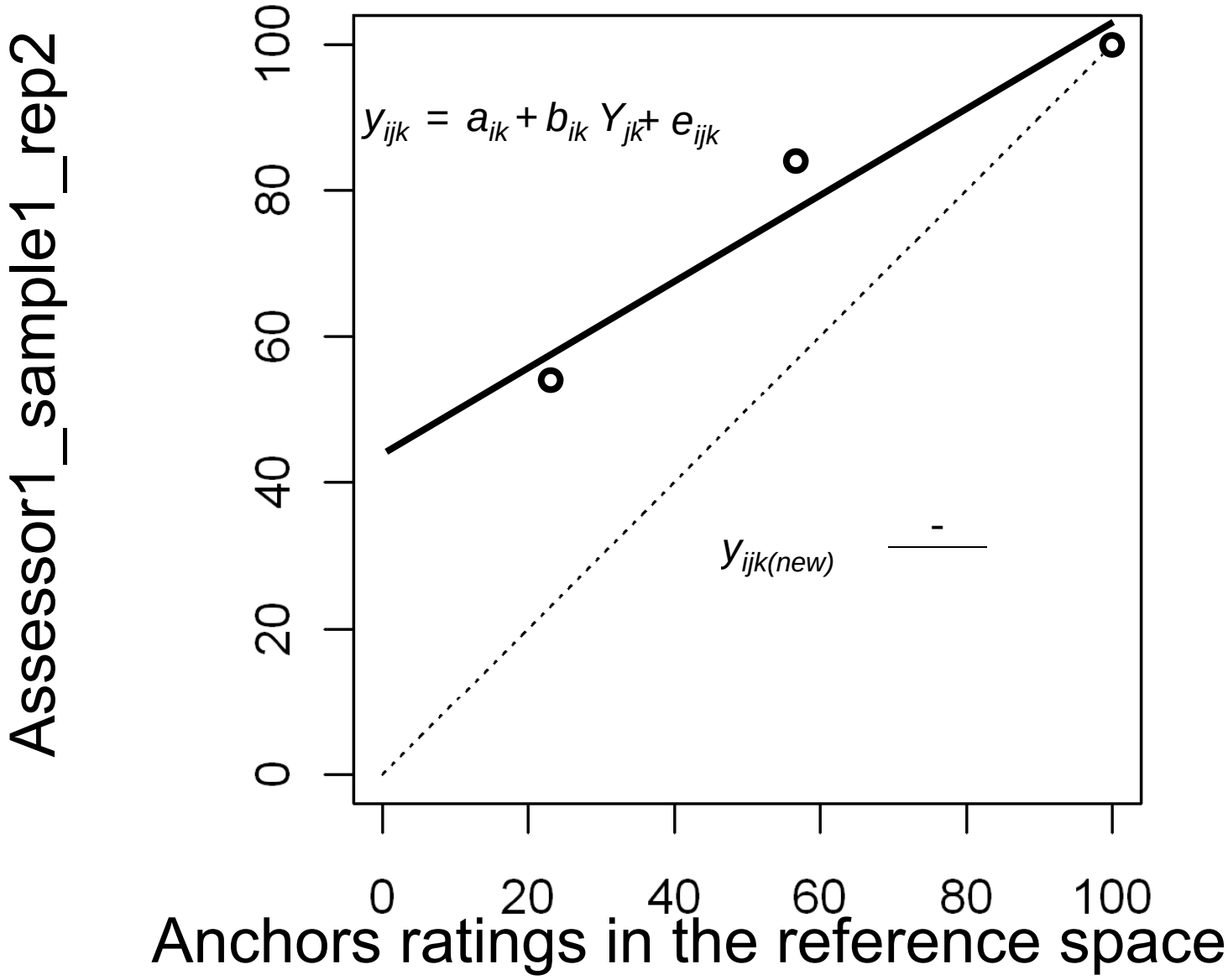
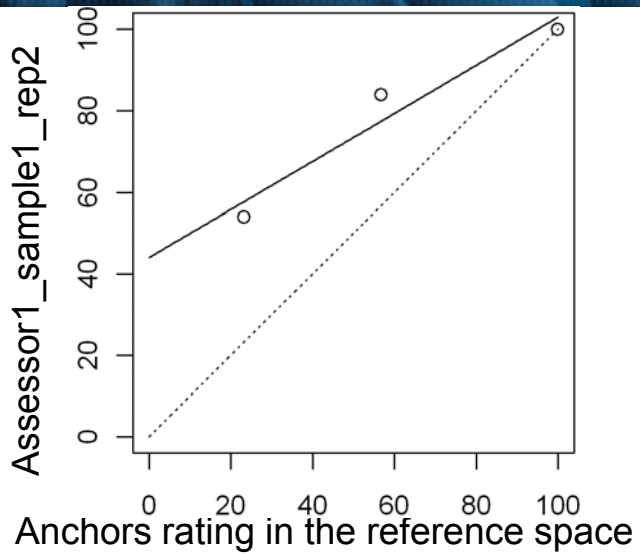
PARAMATERS OF THE TRANSFORMATION

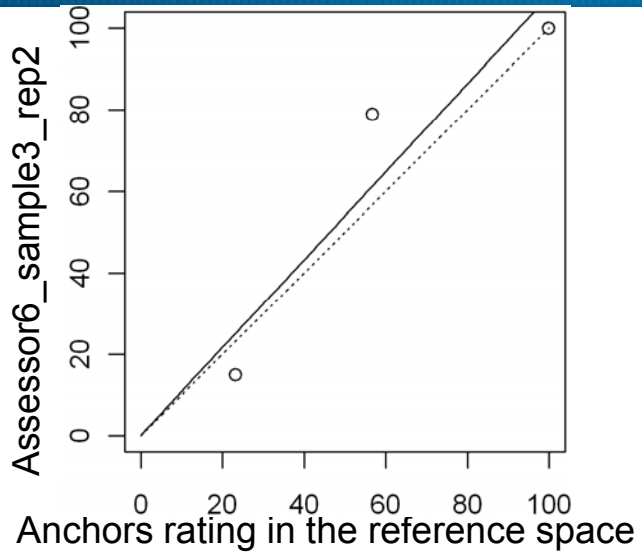
- Number of anchor points : 3 (system_B, system_C, system_D)
- Reference product space: position of the anchors in experiment 1
- Computed on each trial
- No Normalization

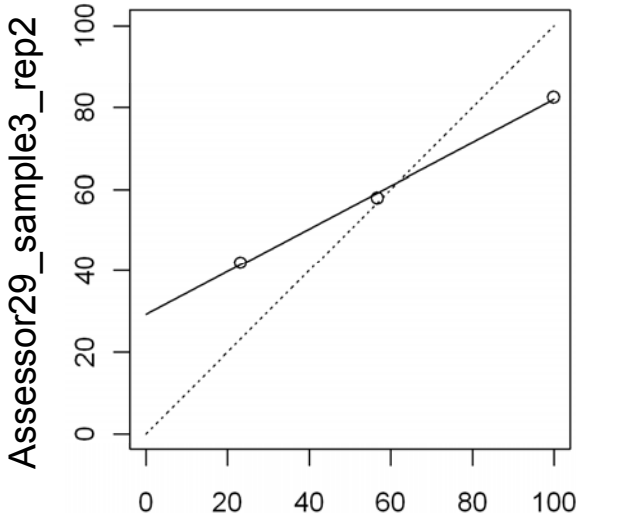
EXAMPLE OF PROJECTION

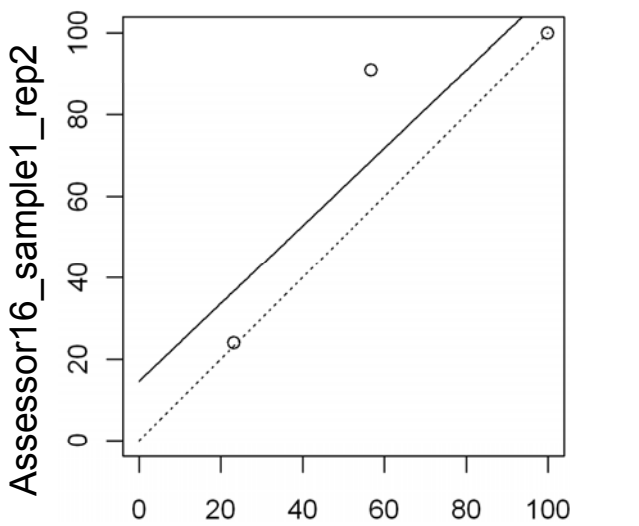


REGRESSION ON THE ANCHOR POINTS

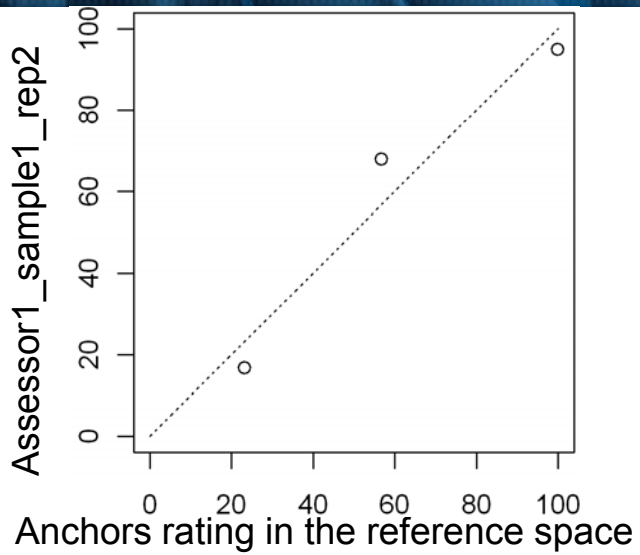


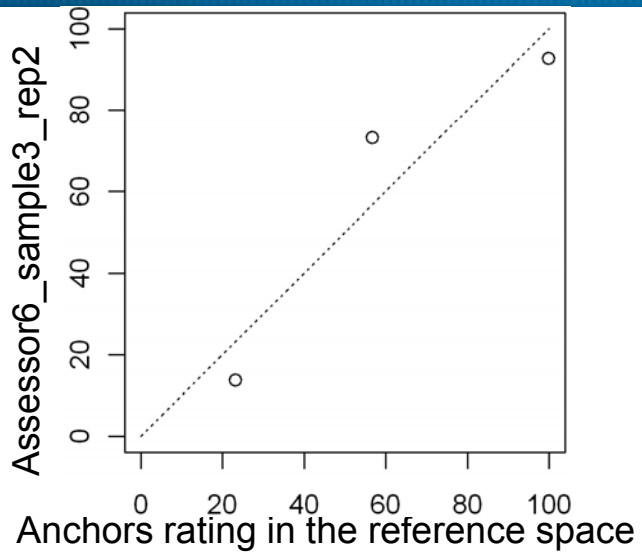


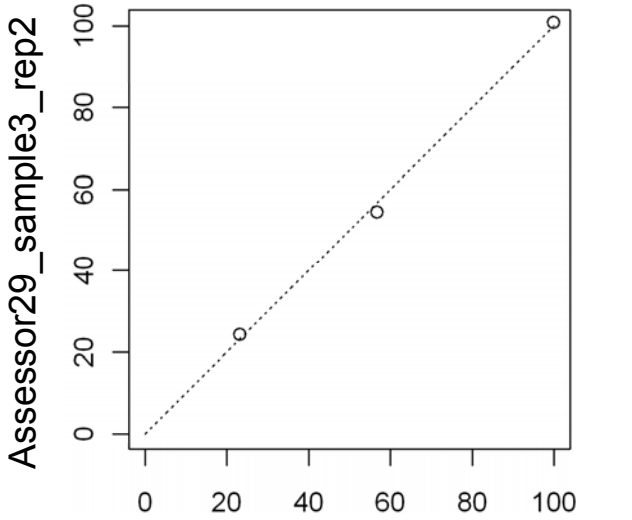


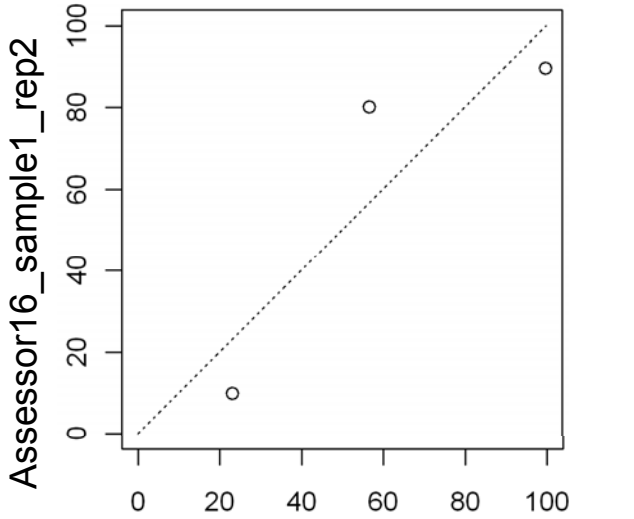


EXAMPLE OF PROJECTION USING THE REGRESSION

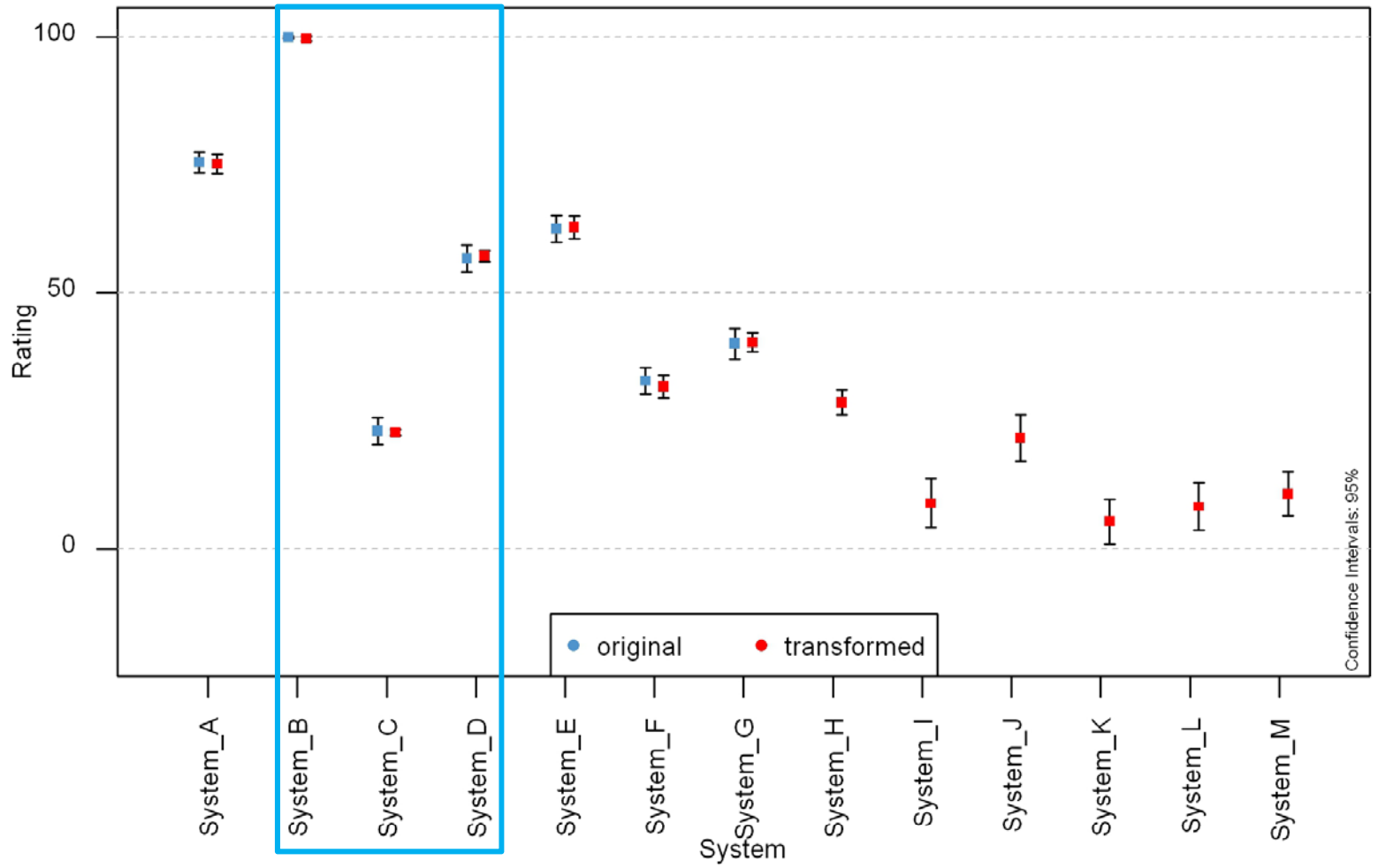








TRANSFORMATION EXPERIMENT 1



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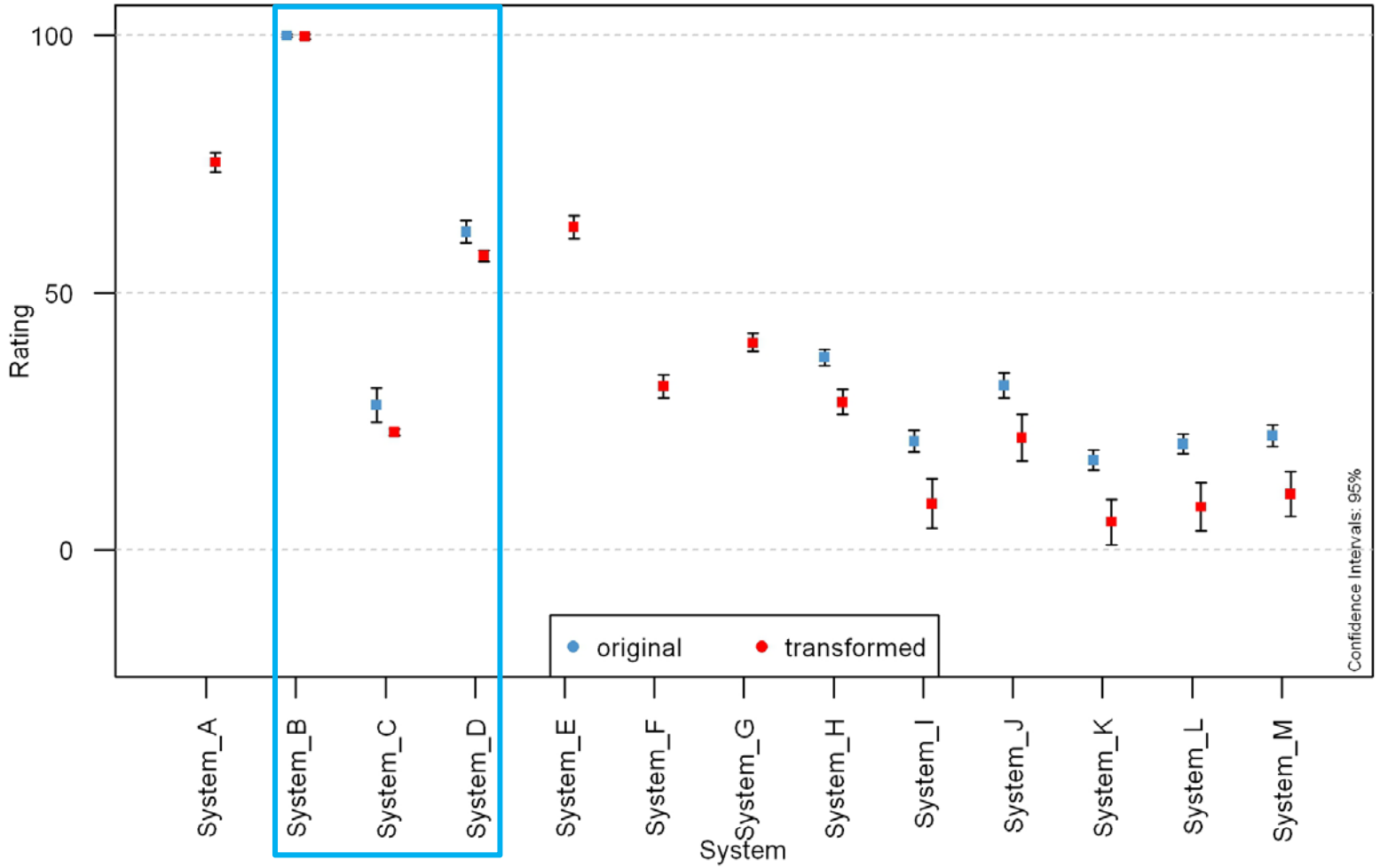
TRANSFORMATION EXPERIMENT 2



CONCLUSIONS

- Allows the experimentator to merge the results from 2 experiments which have at least 2 commun products,

- Regression can be more or less accurate and increase the uncertainty outside the slot defined by the lowest anchor and the highest one

NEXT STEPS

- Test all the options and compare the influence of each of them on the data,
- Test more advanced data analysis on the processed data,
- An indicator of the quality of the transformation should be defined for each assessor or trial (R^2 ?)

Thank you !☺

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