

No trace to waste

loss and relocation of traces during packaging and transport of forensic exhibits

Author(s)

Draxel, Katharina; Jullens, Ingrid; de Ronde, Anouk; Kokshoorn, Bas; de Poot, Christianne

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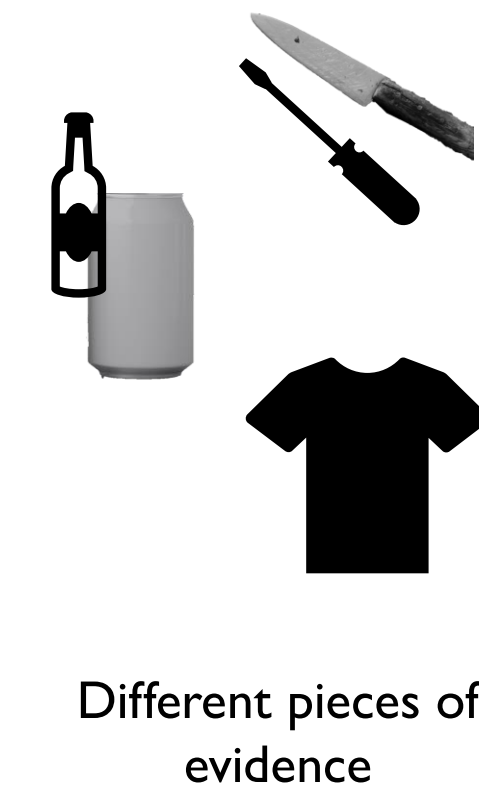
No Trace to Waste: Loss and relocation of traces during packaging and transport of forensic exhibits

Katharina Draxel^{1,2,3}, Ingrid Jullens⁴, Anouk de Ronde¹, Bas Kokshoorn^{1,3}, Christianne de Poot^{1,2,5}

¹Amsterdam University of Applied Sciences, ²VU University Amsterdam, ³Netherlands Forensic Institute, ⁴Dutch National Police, ⁵Police Academy of the Netherlands

Background

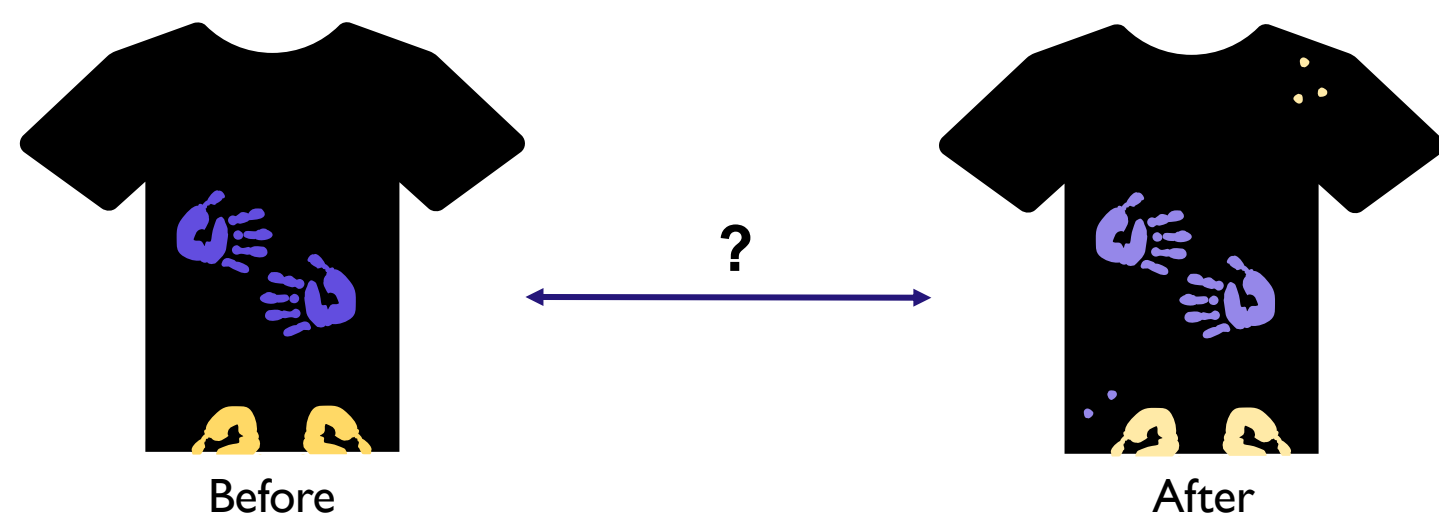
The packaging, transport, and storage of forensic exhibits represent integral steps in the forensic investigation process, ensuring the preservation and integrity of the traces found on items until their subsequent examination. However, limited research shows that loss and relocation of traces can occur during these vital steps^{1,2,3}. The 'No Trace to Waste' project (started January 2023) aims at gaining more knowledge on the extent of this loss and relocation of DNA and fingermarks during the packaging, transport, and storage of forensic evidence. Ultimately, the obtained insights will be used to optimize current procedures.



Aim

Research at Lowlands Science 2023:

- Investigate general dynamics of trace relocation during packaging, transport & storage
- Identify packaging and storage conditions with least amount of relocation of traces



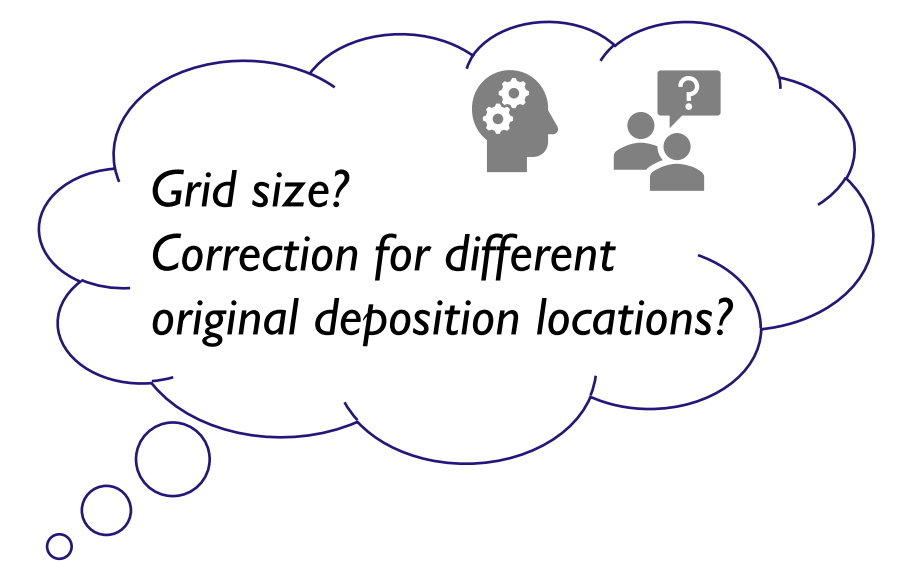
Data analysis

Available data

- Photos of ~270 participants (front and back per participant)
- Captured before and after packaging
- Two colors of fluorescent signal (one color per participant)

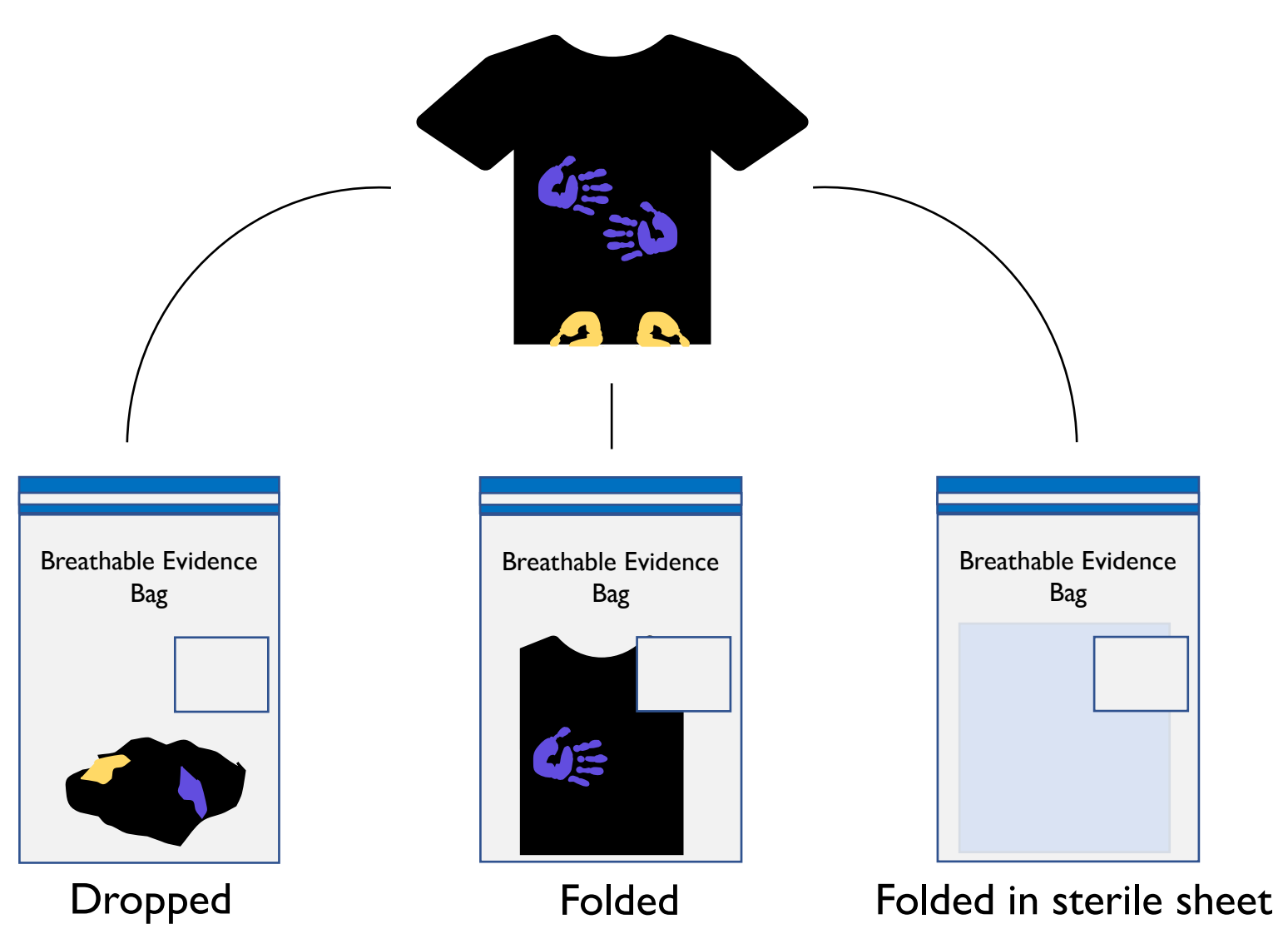
Comparison of photos before and after packaging includes:

- Creating heatmaps to illustrate differences before and after packaging across all participants
- Investigating the relative distance of relocation of traces within each participant
- Calculating ratios to measure the extent of relocation

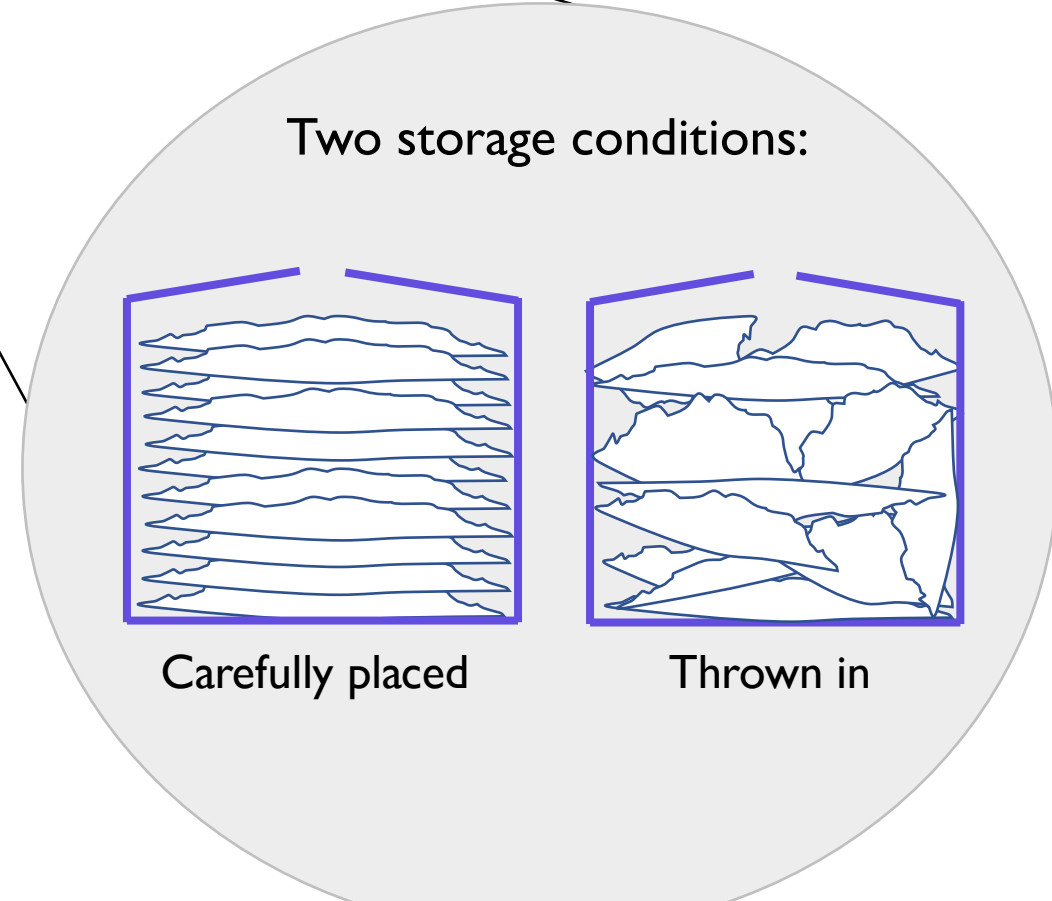


Methodology

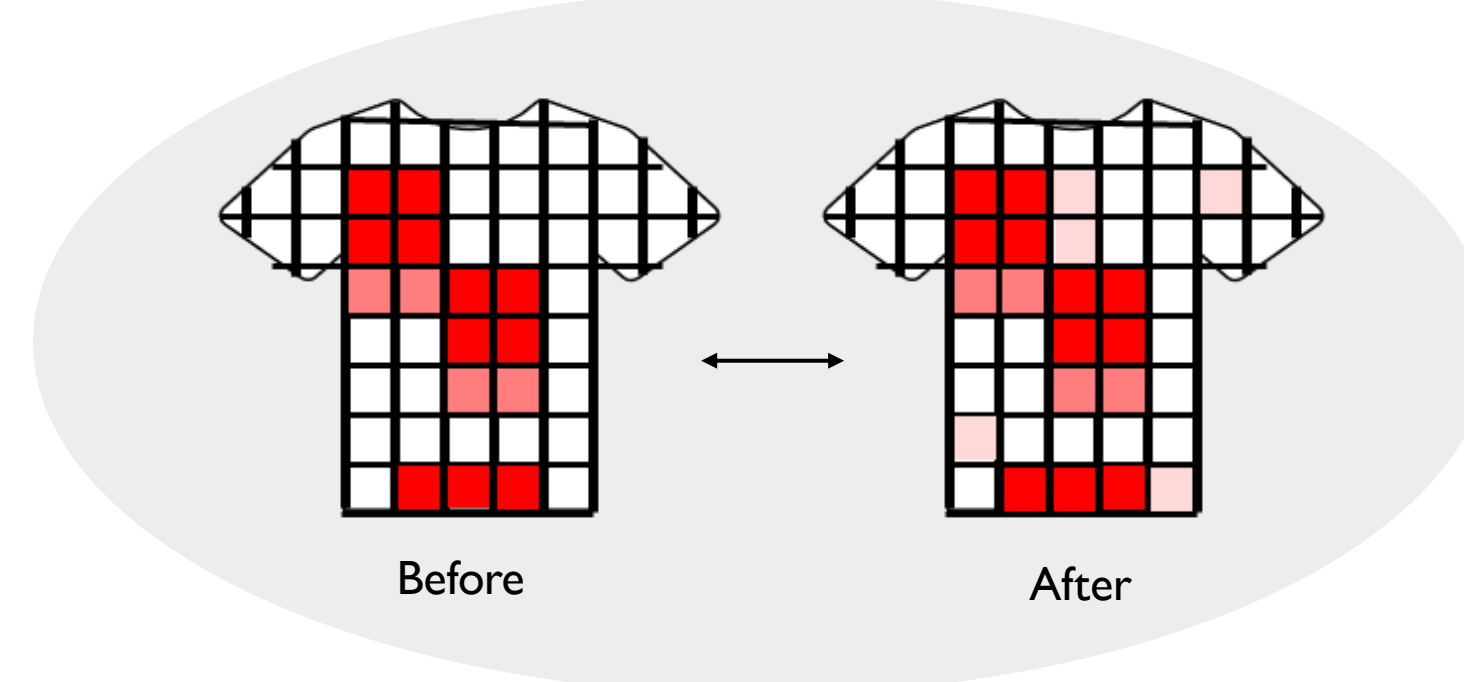
- Survey on demographic data of participants
- Participants deposited fluorescent hand lotion by hugging each other
- T-shirts were packaged and stored under six different test conditions
- Photos of the front and back of the t-shirts were taken before and after packaging



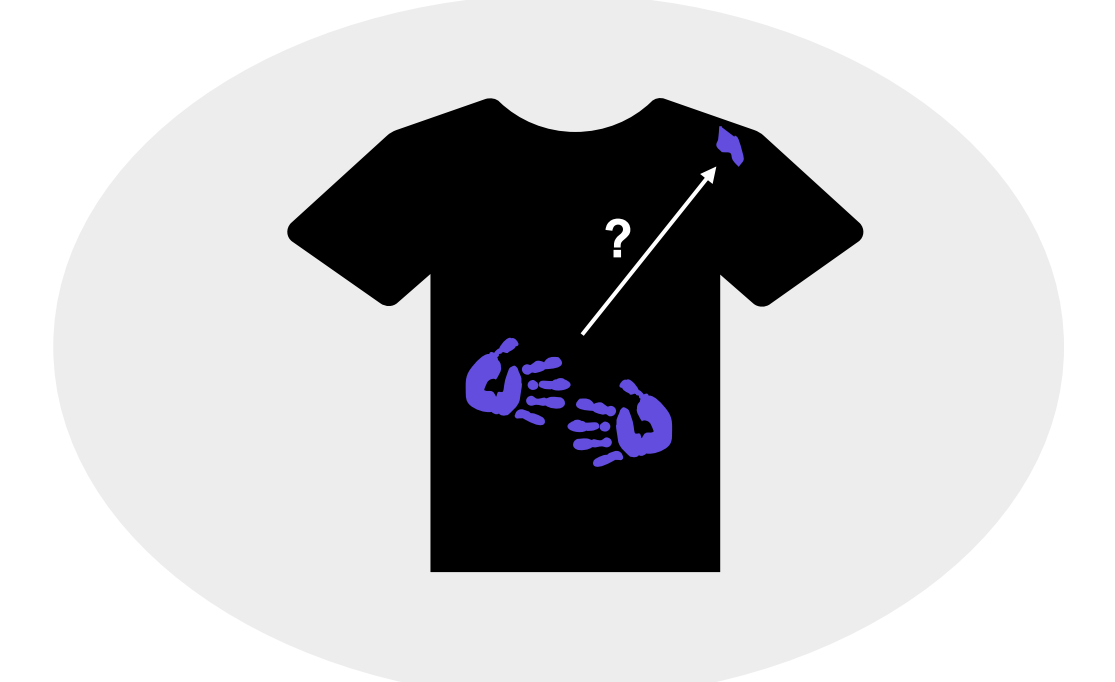
Illustrated is the experimental design of the first experiment, depicting the varying test conditions for the packaging and storage of the t-shirts. Each packaging method is paired with every storage condition, resulting in six test conditions.



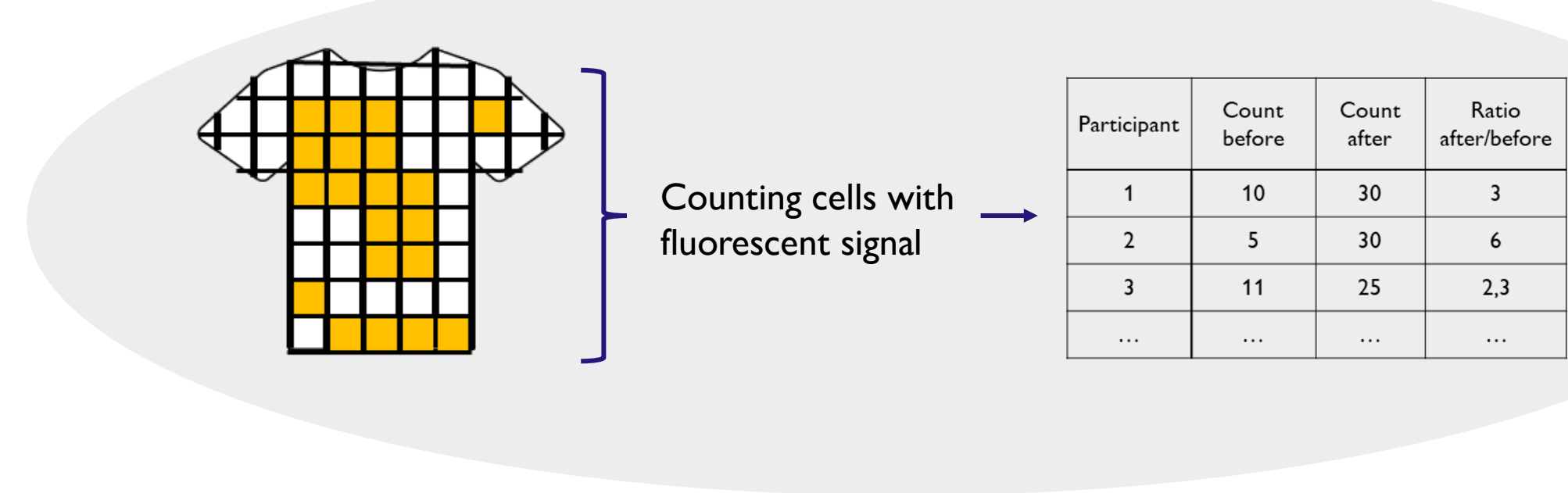
A. Heatmapping



B. Relative distance



C. Ratios



Future outlook

- International questionnaire on currently applied protocols and concerns
- Iteration of first experiment with latent DNA across key variables
- Conducting further experiments with different items combining DNA with fingerprints
- Investigation of the underlying mechanisms governing the potential observed phenomena



References:

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Acknowledgements

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