Impact Analysis of Microinteractions on User Experience in User Interfaces

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About the Presenter

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Education

- M.Sc. Eng. in Computer Science
- Faculty of Electrical Engineering and Computer Science
- Lublin University of Technology

Research Interests

- Human-Computer Interaction
- Accessibility & Usability
- Cognitive Load
- Eye Tracking
- Artificial Intelligence

Research Context & Problem

Microinteractions are small UI elements (animations, feedback, transitions)

Widely used in modern digital systems

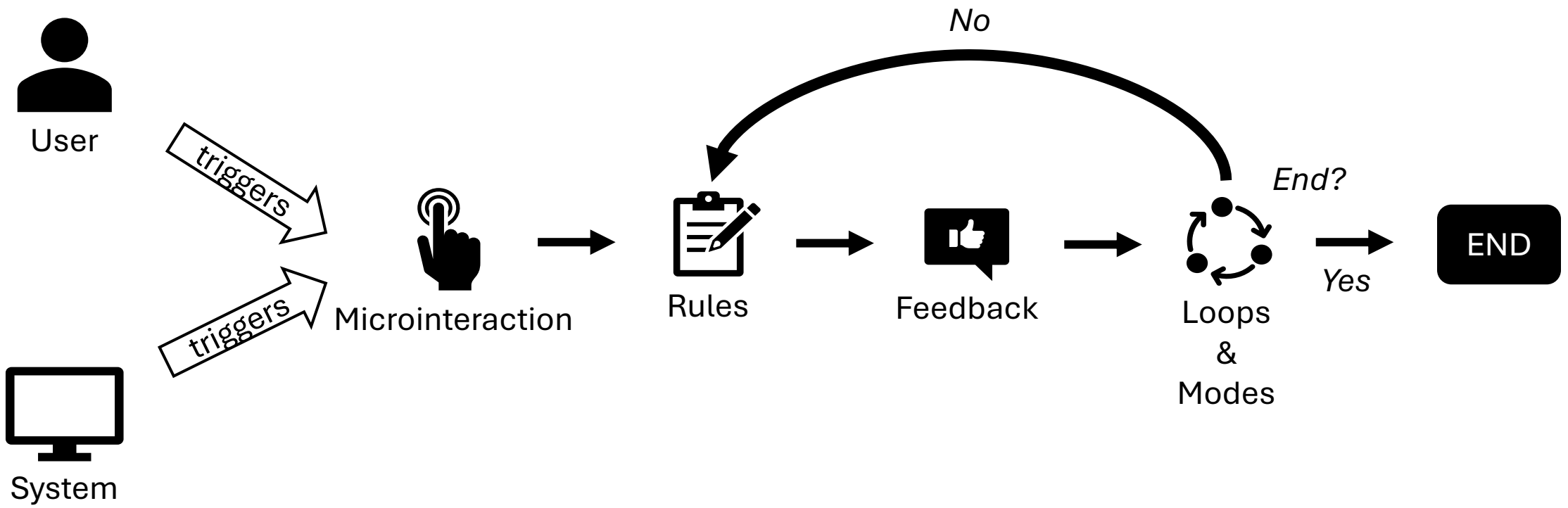
Claimed to improve usability and engagement

Limited experimental evidence combining objective & subjective metrics

Do microinteractions measurably improve user experience?

Microinteractions

Microinteraction – a small, single action within an interface that is task-dependent, completes one specific task and provides immediate feedback.



Research Objective

To empirically investigate the impact of incorporating microinteractions into an e-commerce interface by comparing two versions: one with microinteractions and one without them.

Methodology

Participants

- N = 33 (age 19-25, M = 21.9, SD = 1.06)
- Computer science students
- Two groups:
  - A (n=16) - microinteractions
  - B (n=17) - no microinteractions

Research Object

- E-commerce website (5 views)
- Two interfaces differing in:
  - Button animations
  - Visual feedback
  - Interaction guidance

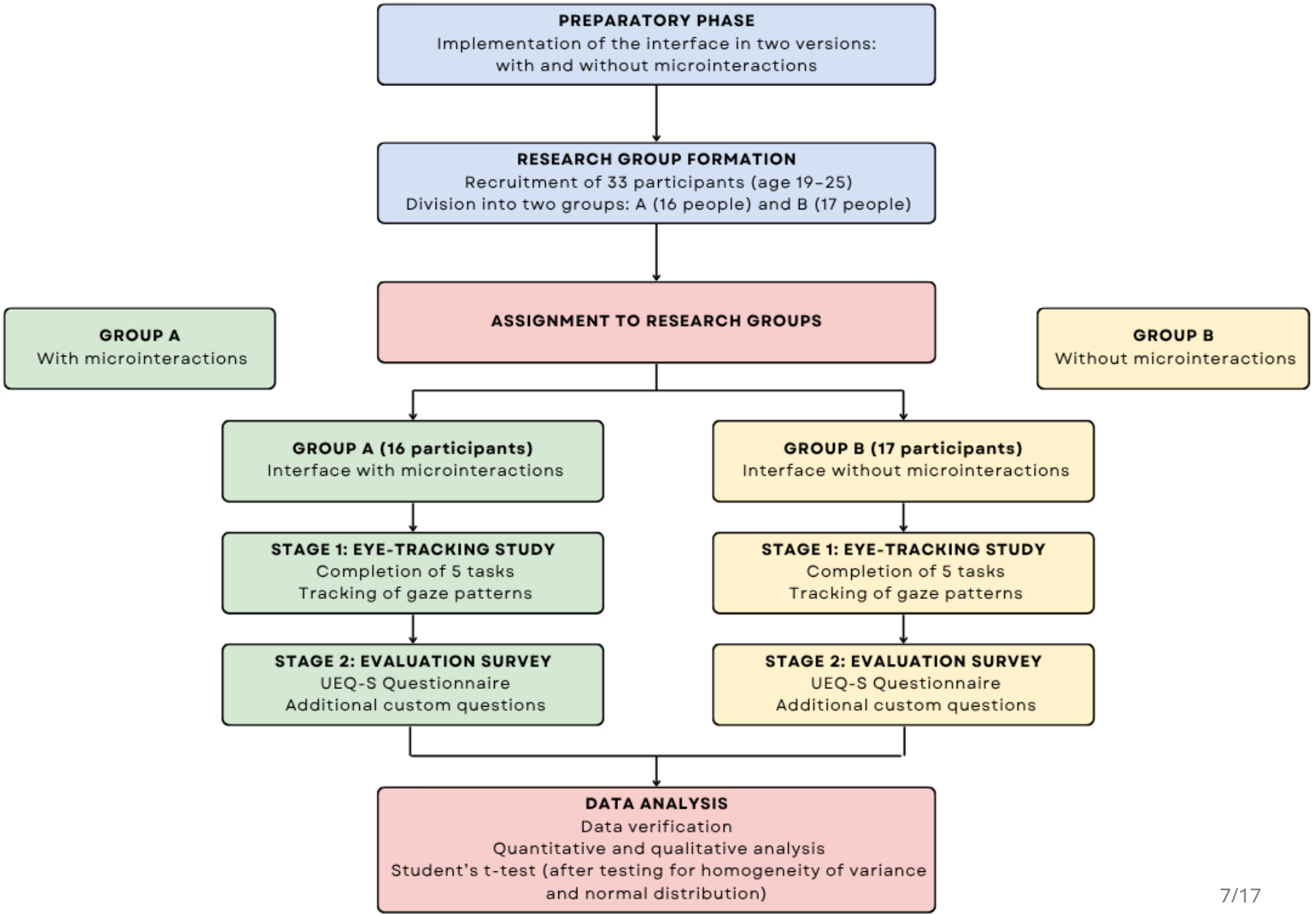
Tools & Metrics

- Eye-tracking metrics:
  - TTFF
  - Dwell Time
  - Fixation Count
  - Peak Saccade Velocity
- UEQ-S + 14 additional items

Data analysis

- Quantitative analysis
- Qualitative analysis
- Statistical comparison (t-tests)

Experiment Procedure

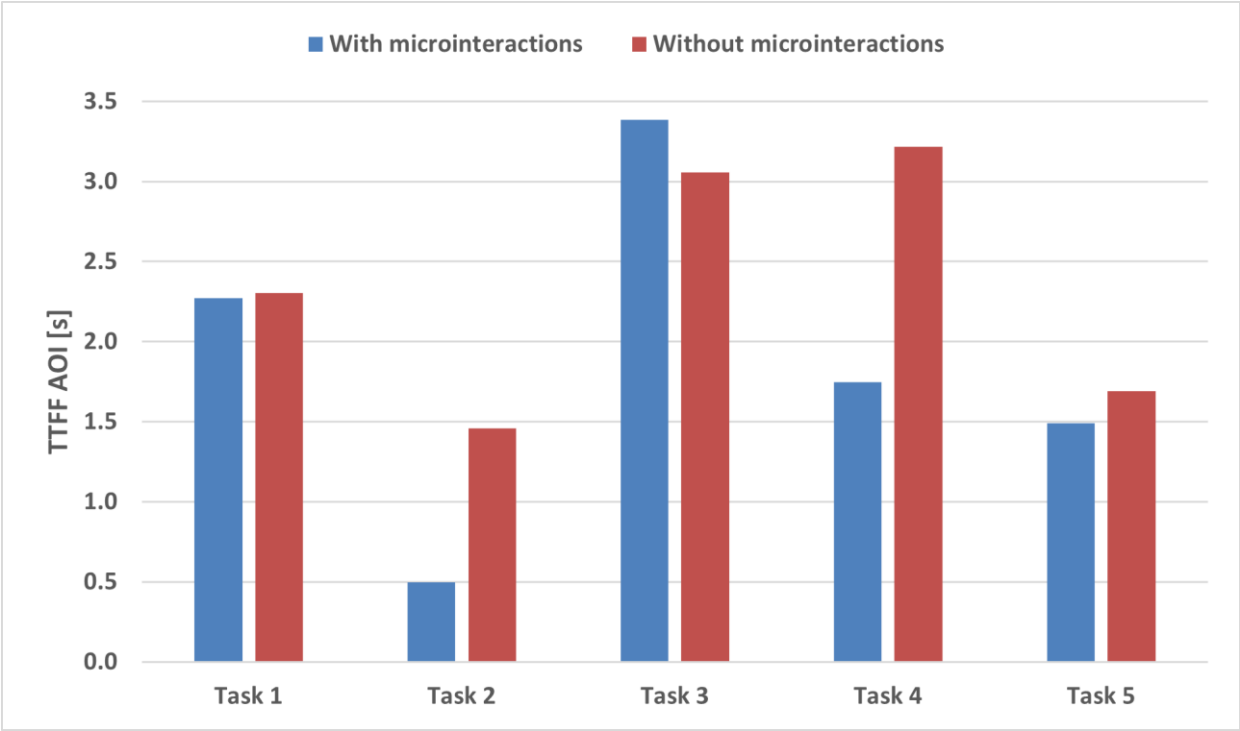


Eye-Tracking Results

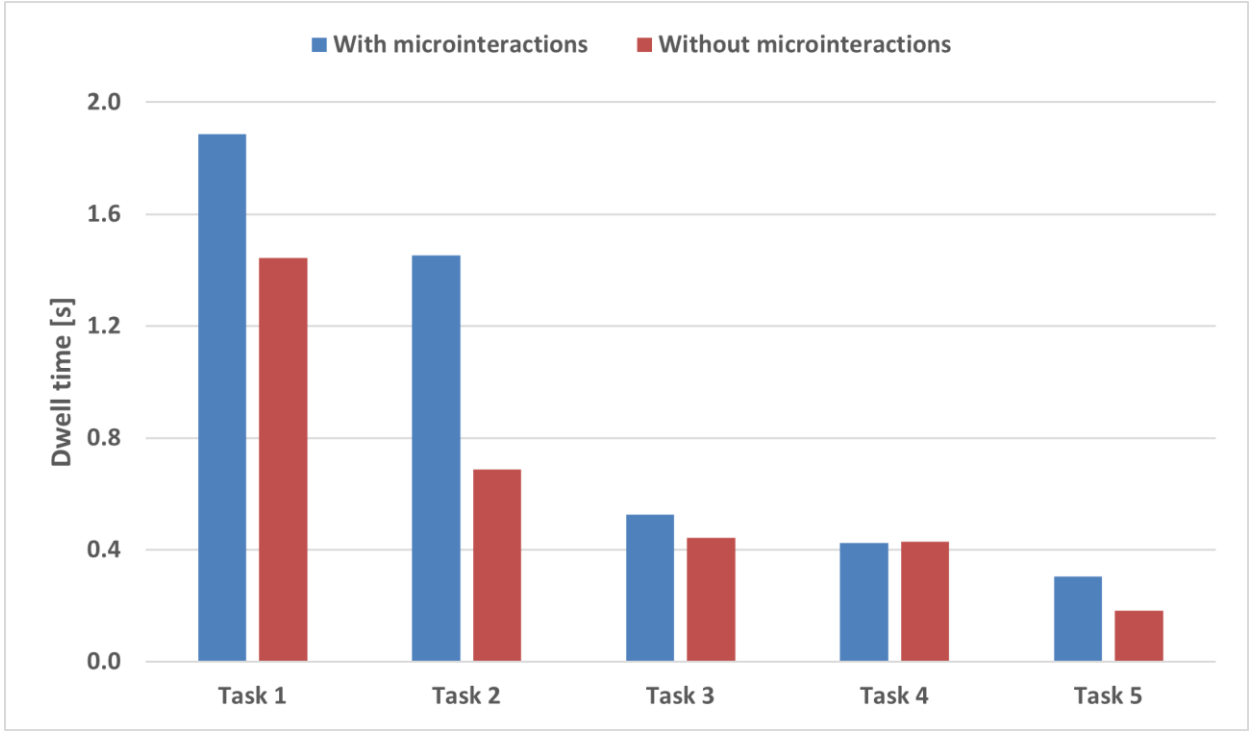
Average values for chosen metrics with the standard deviation.

Metric	With Microinteractions	Without Microinteractions
TTFF [s]	1.88 ± 1.06	2.34 ± 0.79
Dwell Time [%]	25.48 ± 8.00	18.28 ± 5.38
Fixation Count	5.36 ± 2.47	4.06 ± 1.82
Peak Sac. Vel. [deg/s]	80.68 ± 6.25	72.46 ± 4.34

Eye-Tracking Results (TTFF & Dwell Time)

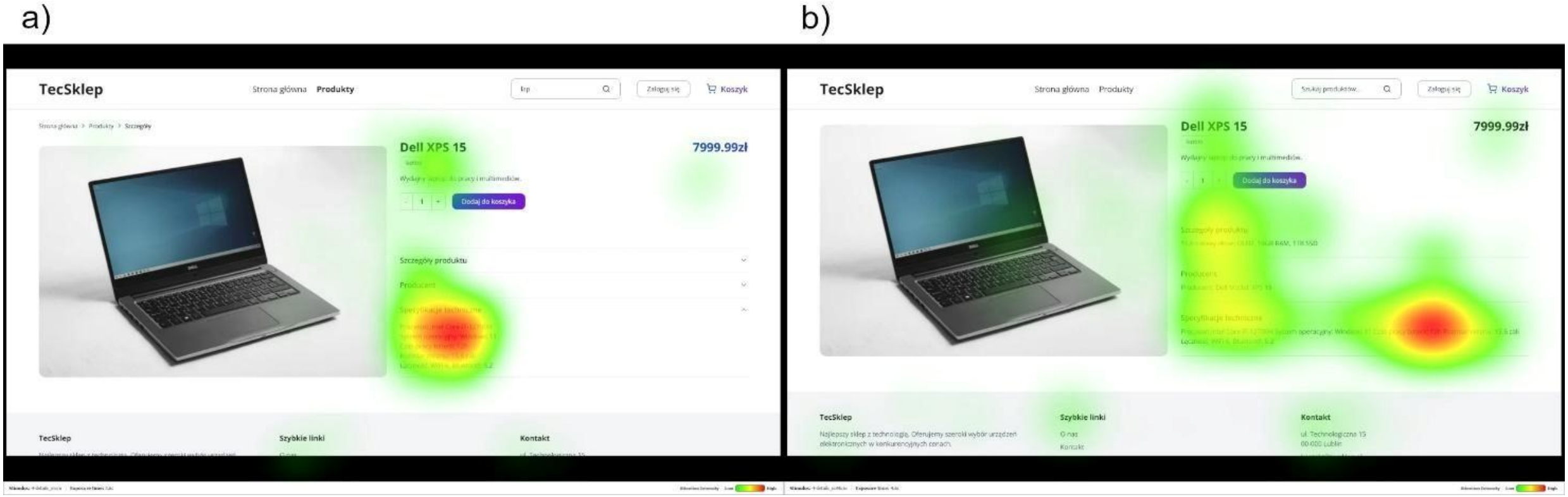


Average TTFF values for each task.



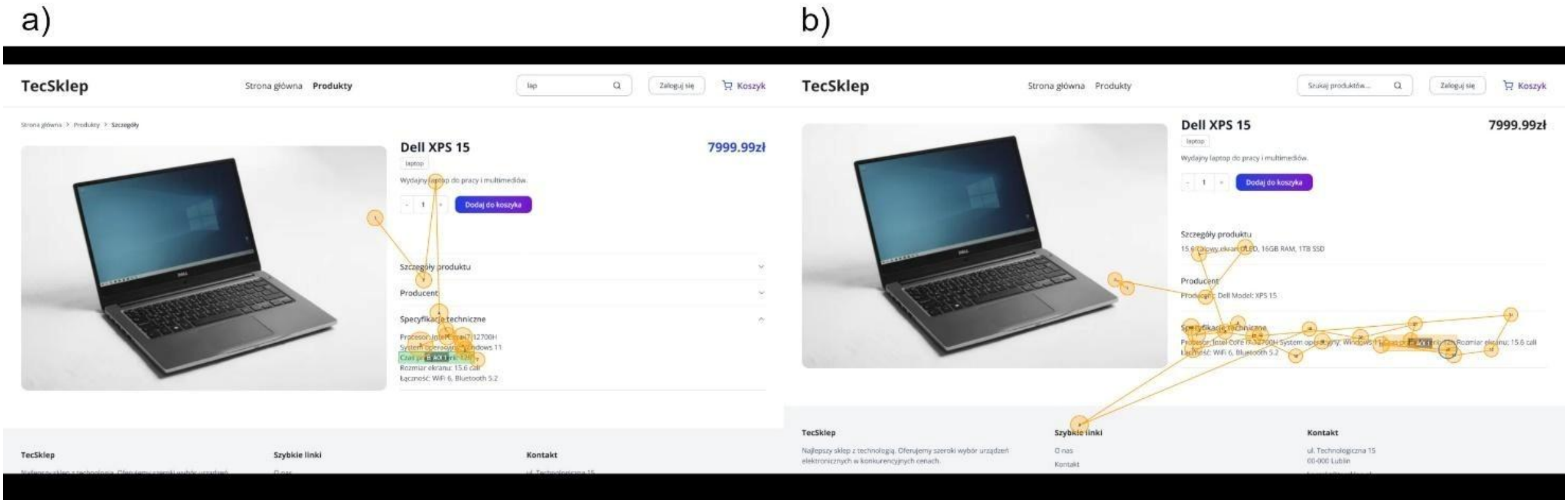
Average Dwell Time on AOI for each task.

Visual Attention Patterns (Heatmaps)



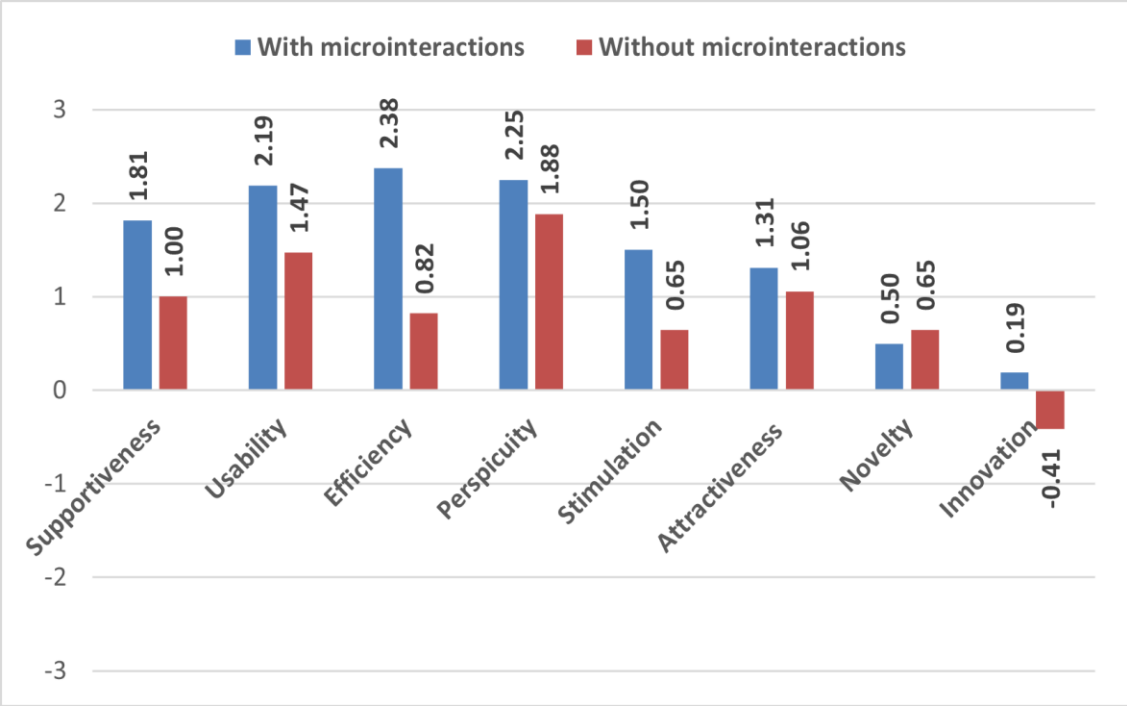
Heatmaps for Task 3: a) with microinteractions, b) without microinteractions.

Visual Attention Patterns (Scanning Paths)

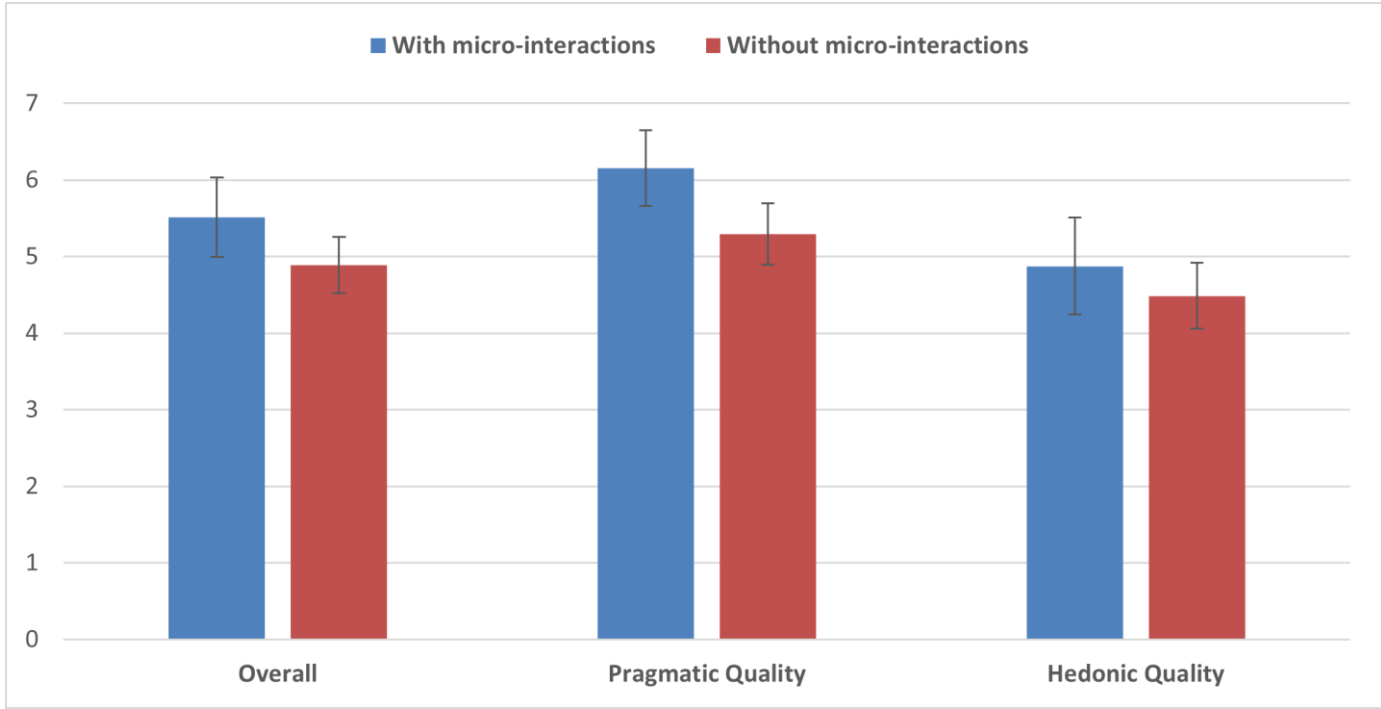


Scanning paths for Task 3: a) with microinteractions, b) without microinteractions.

UEQ-S Results

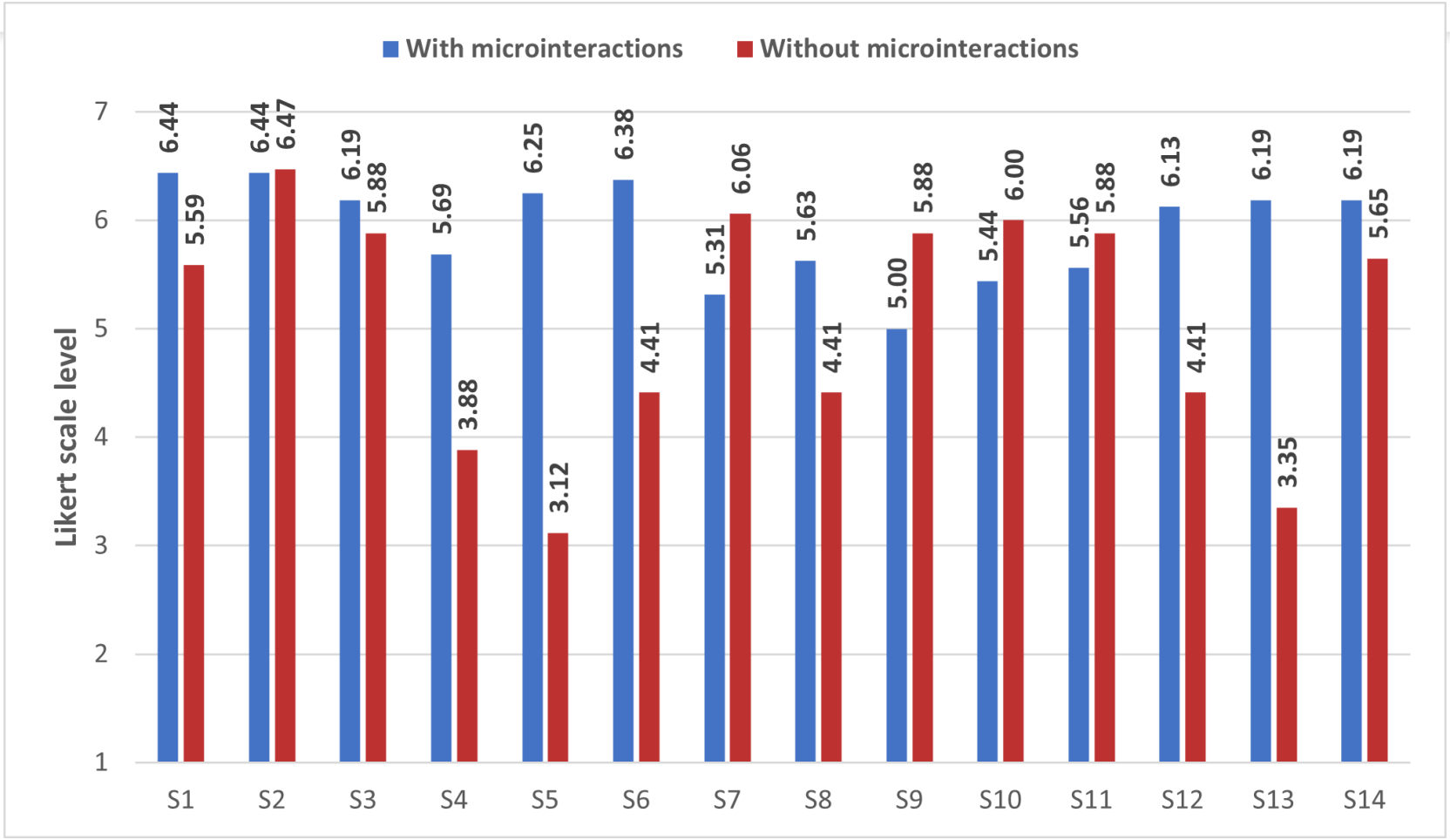


Average user UEQ-S ratings for both interface versions.



Average UEQ-S ratings by dimension.

Additional User Ratings Results



Average user ratings for additional statements.

Statistical Significance of Differences

Statistical test results for UEQ-S for each dimension.

Scale	p-value	Result
Pragmatic Quality	0.004	Significant
Hedonic Quality	0.328	Not Significant
UEQ-S Overall	0.063	Not Significant

Statistical Significance of Differences

Statistical test results for additional statements.

Statement	p-value	Significance
S1	0.059	✗
S2	0.915	✗
S3	0.527	✗
S4	0.007	✓
S5	0.000	✓
S6	0.001	✓
S7	0.027	✓
S8	0.021	✓
S9	0.033	✓
S10	0.154	✗
S11	0.423	✗
S12	0.004	✓
S13	0.000	✓
S14	0.139	✗
Total	**0.017**	✓

Conclusions

Microinteractions improved usability and pragmatic quality

They increased enjoyment and perceived responsiveness

Eye tracking confirmed more focused visual behaviour

No negative impact on comfort or navigation fluidity

Microinteractions significantly enhance overall user experience

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