京都工芸繊維大学
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Comparing the Influence of UI Layout on Usability and Performance for Japanese and Austrian Users

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hilab

Outline

- Background
- Test Procedure
  - Pilot Test
  - Adaptations
- Results
  - Quantitative
  - Qualitative
- Future Work

Figure 1a: [1]

Figure 1b: [1]

Background

Reineck and Bernstein's AUI

Figure 3a: Indian -> France + US [2]

Figure 3b: Mexico -> Bulgaria + Switzerland [2]

Test Procedure » Pilot Test

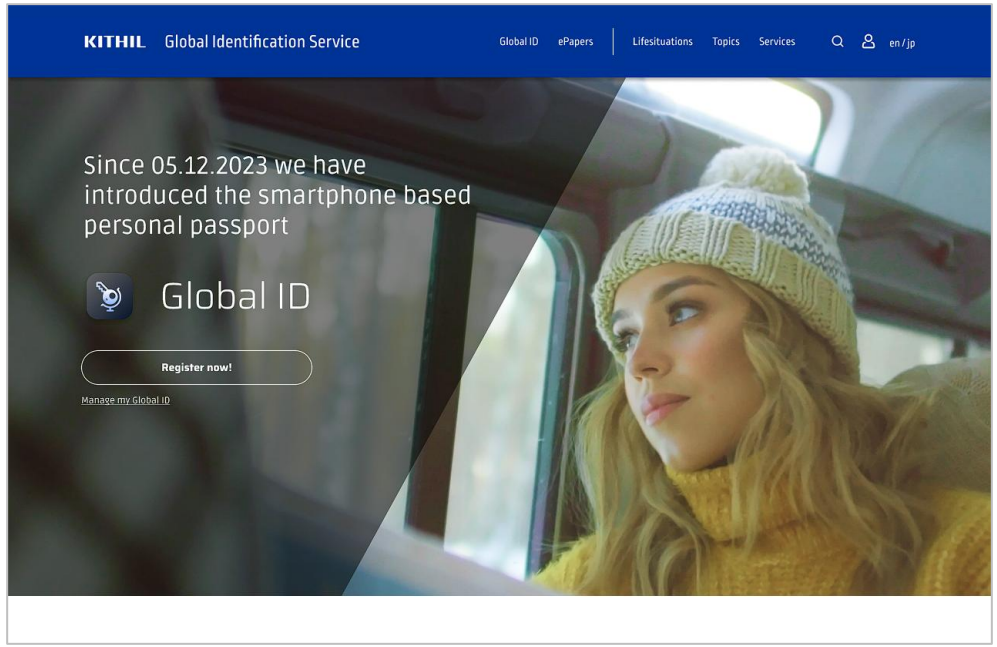


Figure 3a: [a]

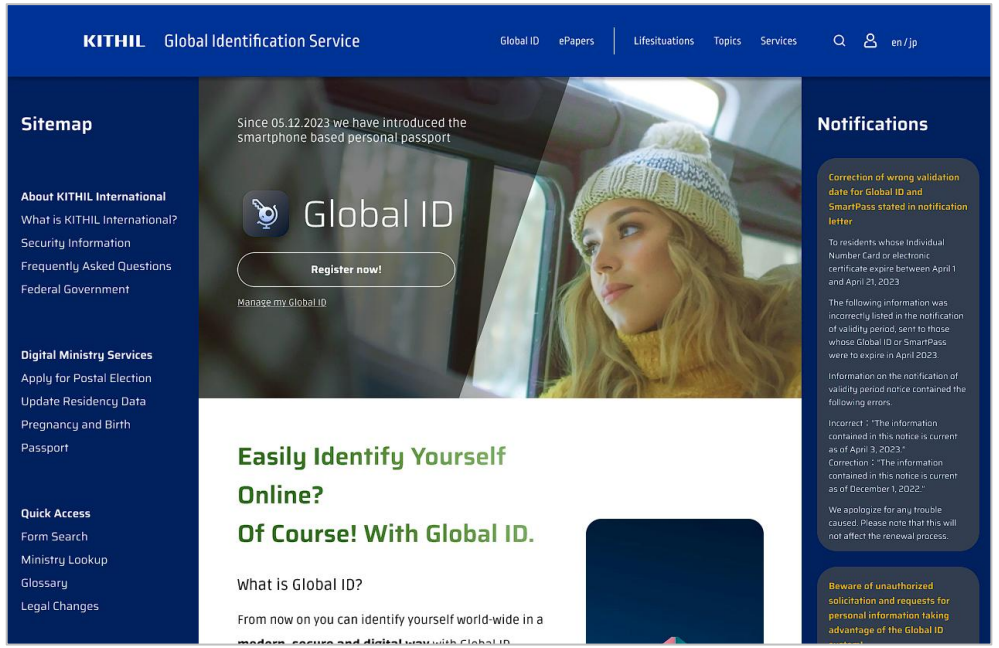


Figure 3b: [a]

Test Procedure » Pilot Test

	Introduction
SYSTEM A	Task 1
	Task 2
	Questionnaire
SYSTEM B	Task 3
	Task 4
	Questionnaire
	Finalization

Test Procedure » Pilot Test

- Test was up to 100 minutes
- English proficiency gap
- Test design not fit for large scale

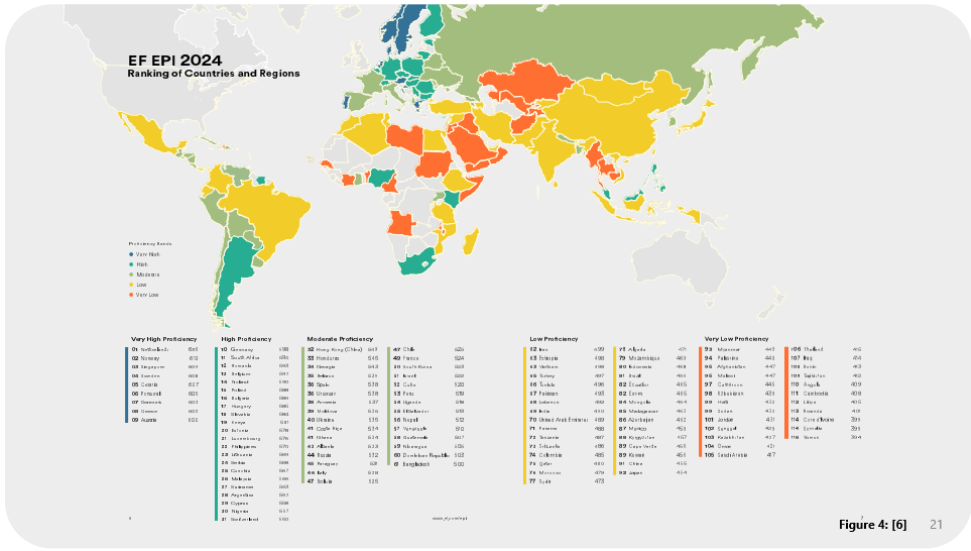


Figure 5: [3]

Test Procedure » Adaptations

- Test was up to 100 minutes
- English proficiency gap
- Test design not fit for large scale

1. Use standardized questionnaire

Questionnaire	
old	**new**
8 Open-Ended Questions	**Laugwitz et al.'s 26-Element Likert Scale**
7 Likert-Style Questions	
System Usability Scale (SUS)	System Usability Scale (SUS)
Optional Notes	Optional Notes
Statistical	Statistical

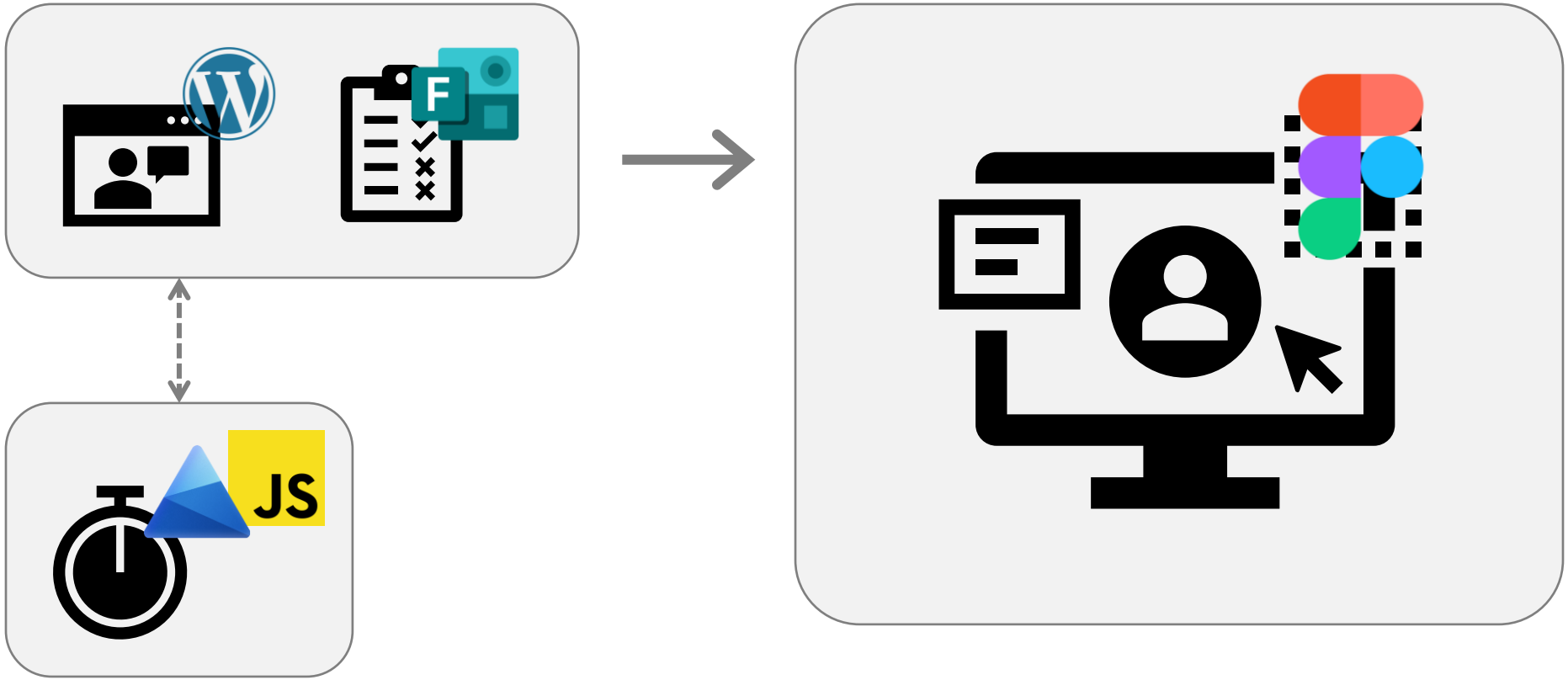
Test Procedure » Adaptations

- Test was up to 100 minutes
- English proficiency gap
- Test design not fit for large scale

1. Use standardized questionnaire
2. Task descriptions in English **and Japanese**
3. Enable autonomous testing

Test Procedure » Adaptations

Enable autonomous testing



Test Procedure » Adaptations

Enable autonomous testing

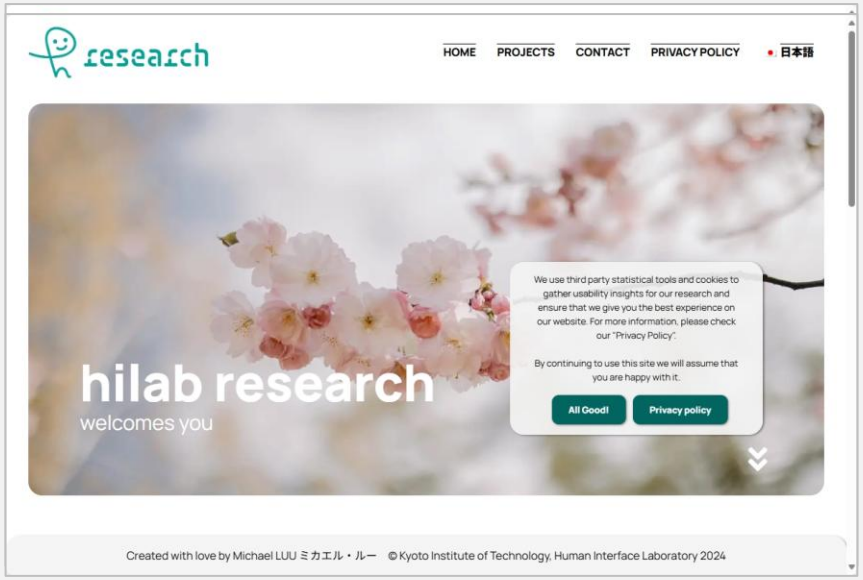


Figure 6a

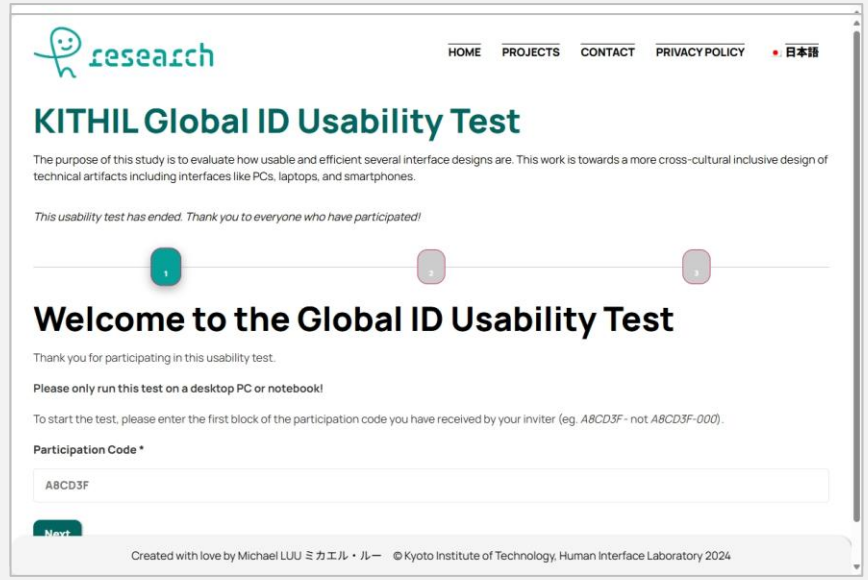
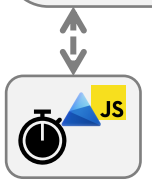


Figure 6b



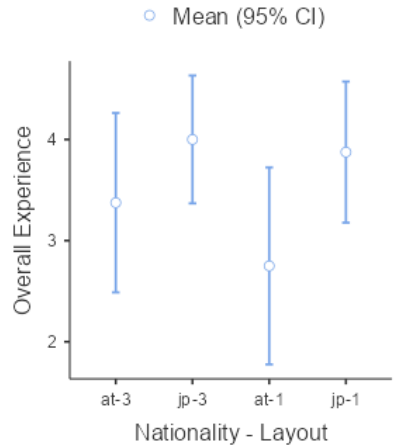
Test Procedure

Test Specifications

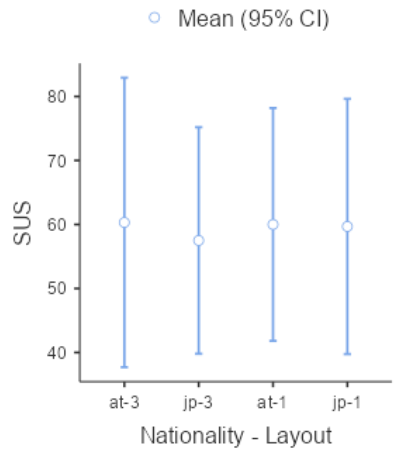
	JAPANESE	AUSTRIAN
Num. of Participants	**16 (11)**	**13 (13)**
Age	21-27 y.o.	21-29 y.o.
Average Age	23.5 years	25.2 years
Female / Male	1 : 1	0.7 : 1
Test Duration	approx. 35min	

Results » Quantitative

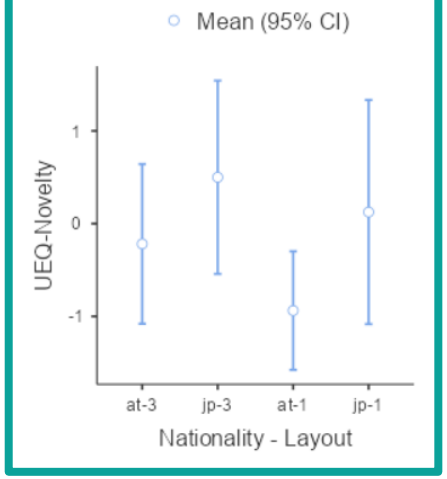
Overall	N	Mean	Std. D.	Std. E.
jp-1-col	8	**3.9**	0.8	0.3
jp-3-col	8	4.0	0.8	0.3
at-1-col	8	**2.8**	1.2	0.4
at-3-col	8	3.4	1.1	0.4

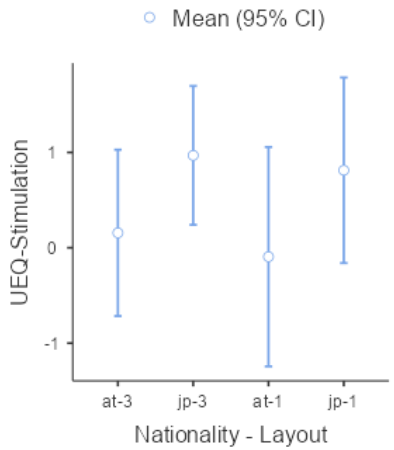


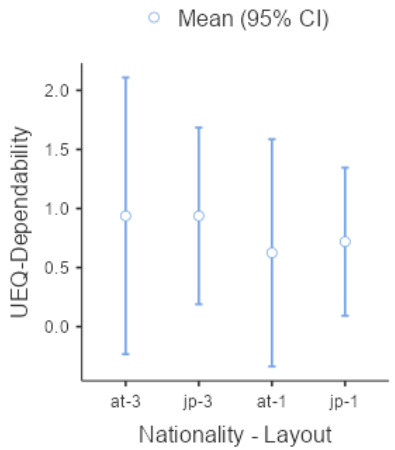
SUS	N	Mean	Std. D.	Std. E.
jp-1-col	8	59.7	23.8	8.4
jp-3-col	8	57.5	21.2	7.5
at-1-col	8	60.0	21.8	7.7
at-3-col	8	60.3	27.0	9.6

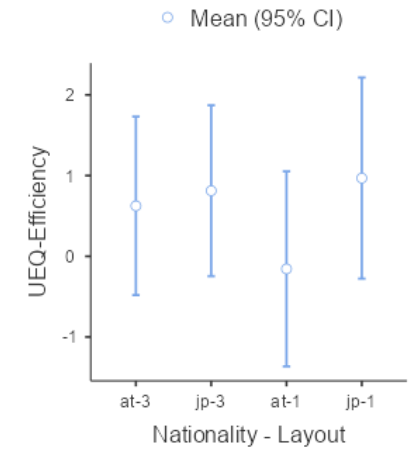


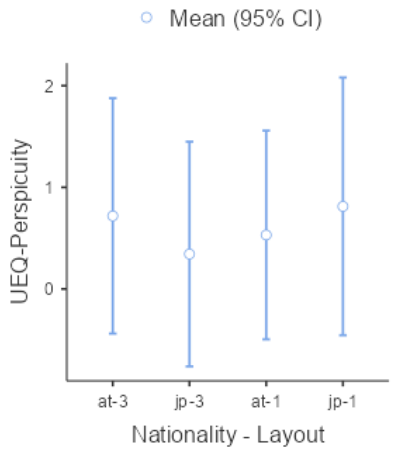
Results » Quantitative

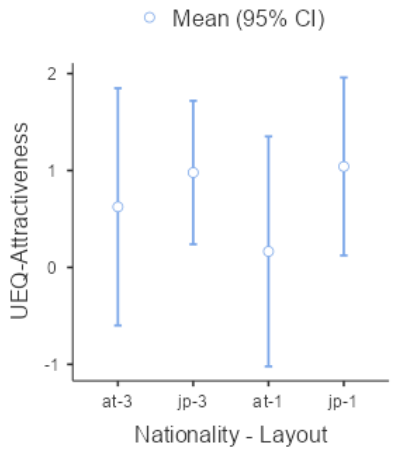










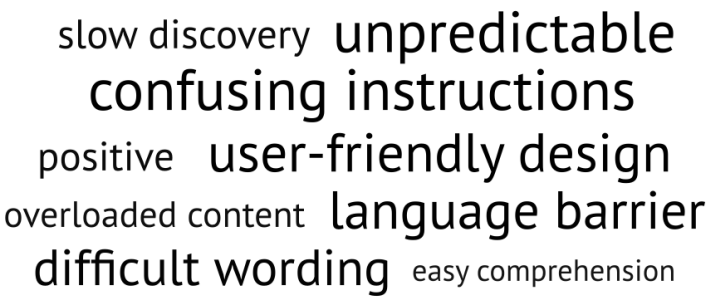
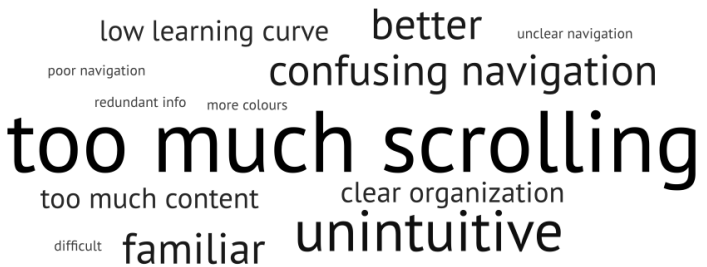
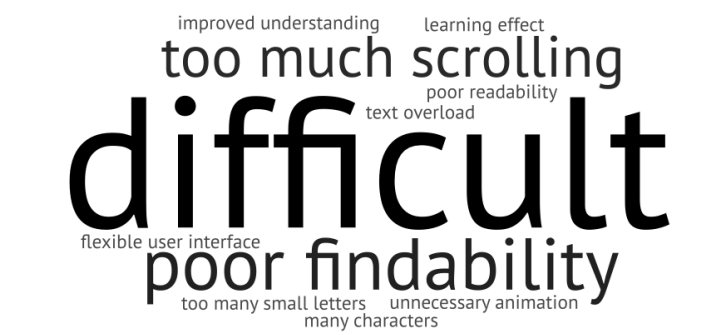
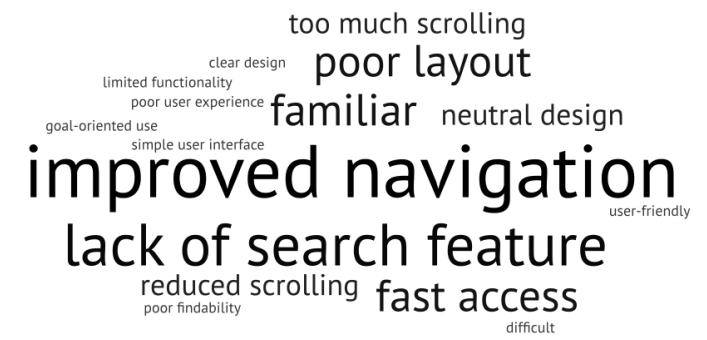


Games-Howell Post-Hoc Test
– UEQ-Novelty

		jp-1-col	jp-3-col	at-1-col	at-3-col
jp-1-col	Mean diff.	—	-0.375	1.060	0.344
	p-value	—	0.943	0.309	0.945
jp-3-col	Mean diff.		—	1.44	0.719
	p-value		—	0.071	0.603
at-1-col	Mean diff.			—	-0.719
	p-value			—	0.420
at-3-col	Mean diff.				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Results » Qualitative

	JAPAN	AUSTRIA
1-COL		
3-COL		

Results

- Layout shows no difference in preference
- Japan has **Low Uncertainty Avoidance** [4]
- Japan has **High Fatigue Resistance** [5]
- Protentional presence of different relevant factor

Future Work

1. Investigation of other factors
   i. Wording
   ii. Icons
   iii. Kawaii [4]

*Increase number of participants to 42 or more

1. Consolidated Usability Guideline

References

[1] T. Masuda, R. Gonzalez, L. Kwan, and R. E. Nisbett, “Culture and Aesthetic Preference: Comparing the Attention to Context of East Asians and Americans,” Personality and Social Psychology Bulletin, vol. 34, no. 9, pp. 1260–1275, Sep. 2008.

[2] M. H. Miraz, M. Ali, and P. S. Excell, “Adaptive user interfaces and universal usability through plasticity of user interface design,” Computer Science Review, vol. 40, p. 100363, May 2021.

[3] EF Education First, “EF English Proficiency Index,” Annual Report 2024 Edition, Signum International AG, 2024.

[4] R. Alexander, N. Thompson, T. McGill, and D. Murray, “The Influence of User Culture on Website Usability,” International Journal of Human-Computer Studies, vol. 154, p. 102688, Oct. 2021.

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[a] Helmut Michael Luu, Wan-Jou She, Shogo Kajimura, and Yu Shibuya, "Influence of User Interface Layout on Usability: A Comparison Between Japanese and European Users– Pilot Test," in 2024 IEEE 13th Global Conference on Consumer Electronics (GCCE), Oct. 2024, pp. 744–748, doi:10.1109/GCCE62371.2024.10760501.

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Questions or Feedback?

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