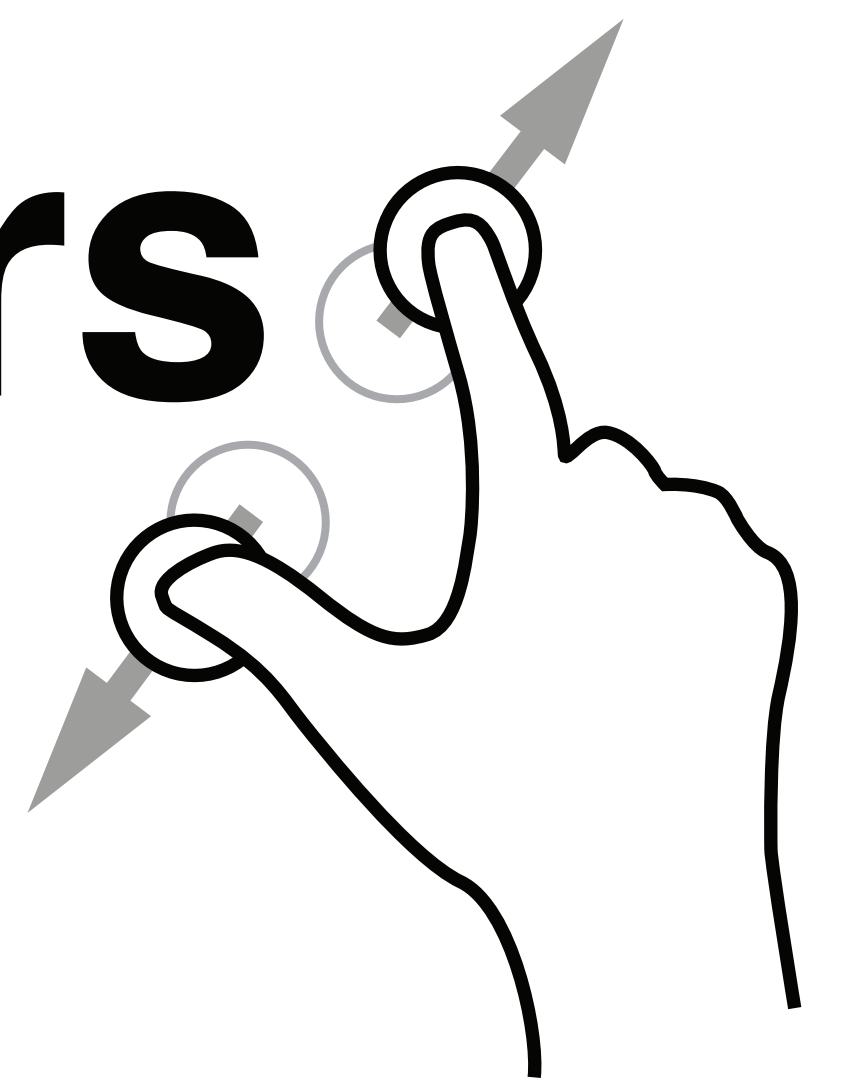


Gesture Interface Magnifiers for Low-Vision Users

Seunghyun "Tina" Lee and Jon Sanford



Existing low vision video magnifiers utilize similar types of indirect (i.e., require mental translation between hand and screen) input mechanisms on magnification (e.g., push button, rotate knob) and navigation (e.g., move magnifier) methods. However, studies [1,2] have shown that because indirect inputs require users to translate the physical distance moved to the virtual distance moved on a screen, they may further complicate reading tasks.

TEST DEVICES



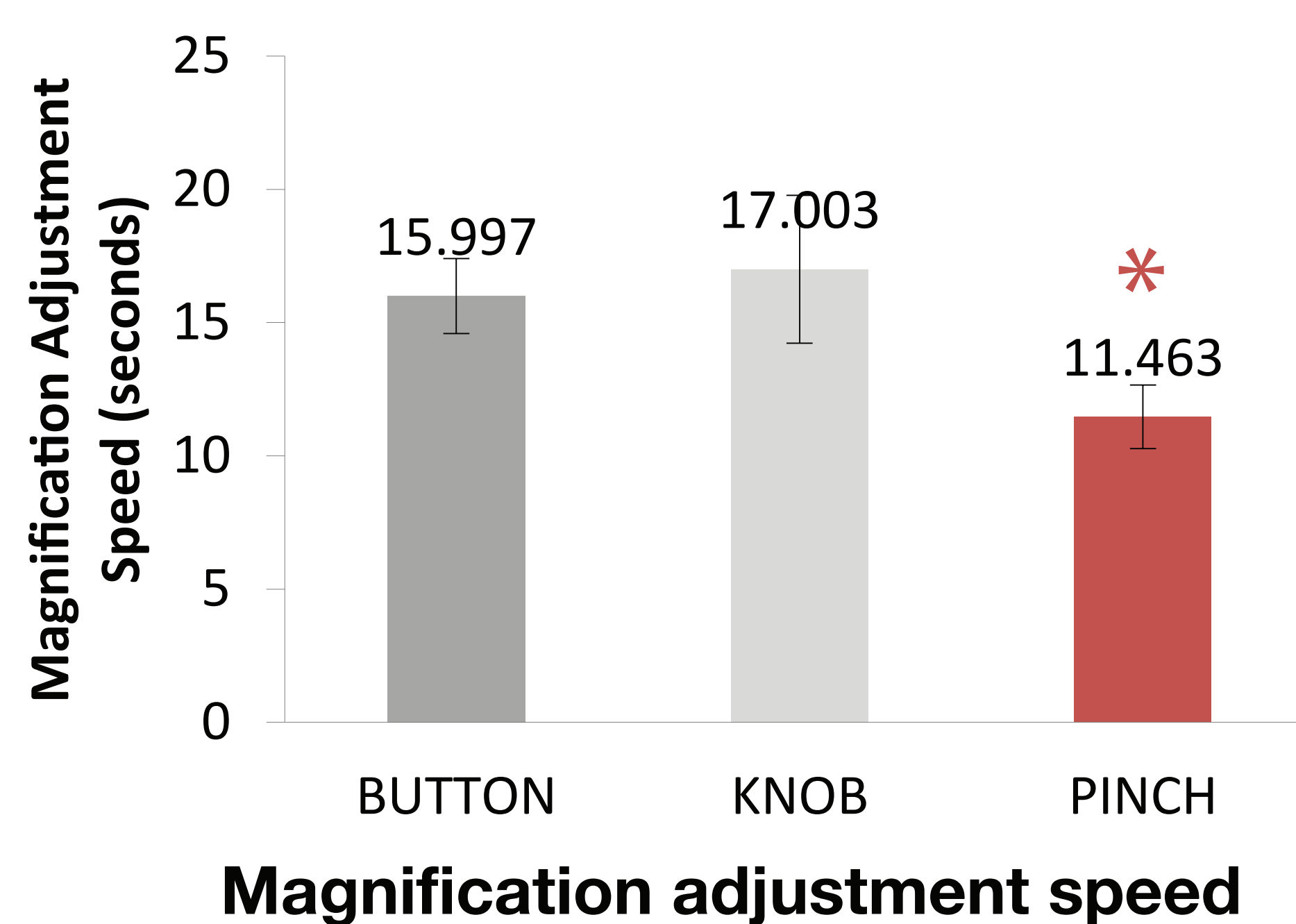
SmartView Pocket
"Pushing" a button
movement with tilt



Amigo
"rotating" a knob
movement without tilt



iPod Touch
pinch gesture
slide gesture



RESULTS

A repeated measures analyses of variance (ANOVA) was used to examine significant differences in task performance, subjective ratings on ease of use, ease of understanding, satisfaction between magnification and navigation input controls. Magnification adjustment speed showed a statistically significant difference ($p = .047$) between the pinch gesture interface and both the button and knob controls. User satisfaction and preferences for pinch and slide gestures were remarkably high.

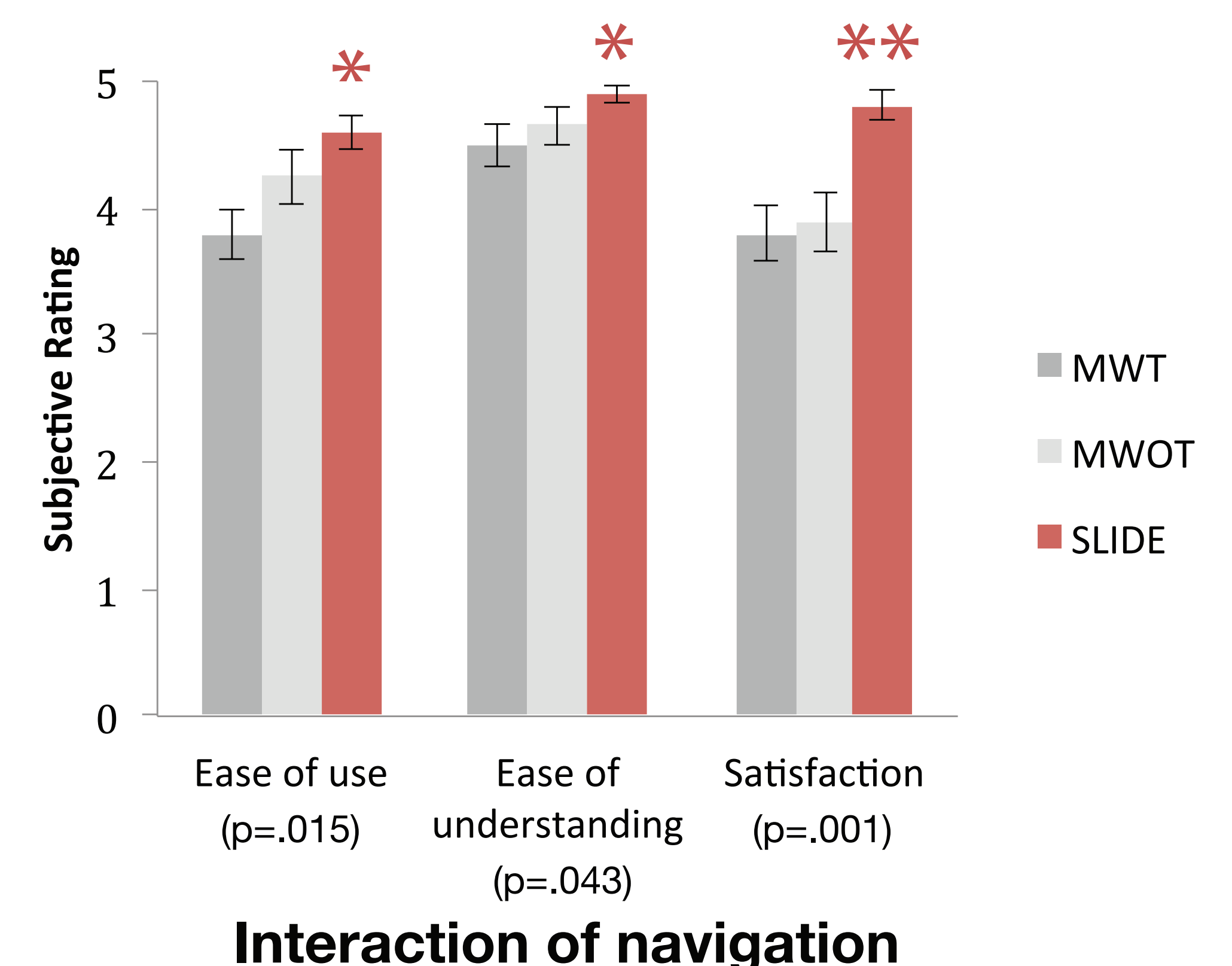
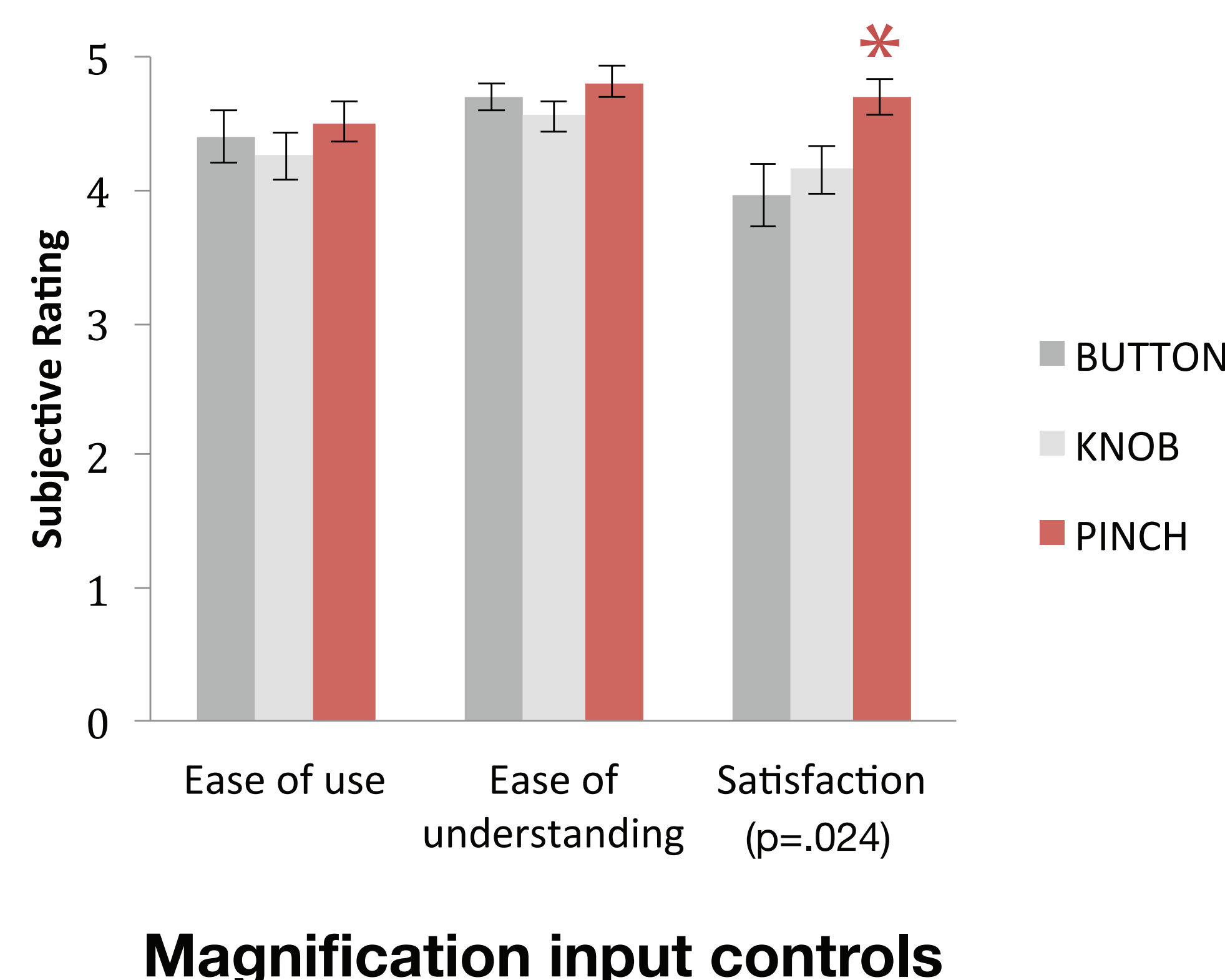
FINDINGS

The findings of this study suggest that direct gesture type magnification and navigation methods are potentially more effective methods of input for the low vision participants. Surprisingly, despite the fact that participants had no experience using gestures for magnification or navigation, they were faster and more satisfied when using a gesture on magnification than the indirect input methods, pushing a button or rotating a knob, which had already been familiar to them from other electronic devices.

Preferences

Thirteen participants (65%) preferred the PINCH gesture the most followed by 25% who preferred the BUTTON and 10% who preferred the KNOB as a magnification method: "It's very unique, it's different than other devices", "very easy to do once I learn", "easier to magnify using fingers than other devices", and "pinch gesture seems more accurate than button."

Seventeen participants (85%) preferred the SLIDE gesture followed by 10% for MWOT and 5% for MWT as a navigation input control: "very easy to move with one finger", "I am totally satisfied with this", "I just need to move my



ACKNOWLEDGMENTS

We thank all the low vision users who participated in our study and support from the Center for the Visually Impaired (CVI) and Atlanta VA Rehabilitation R & D Center for Vision Loss.

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