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Hear About It: Case Study on Designing for Pixel Buds Pro Earbud Comfort

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Designing wearable devices that accommodate diverse user anthropometrics and lifestyles is a challenge in Human Computer Interaction. This is particularly true for earbuds. In this case study, we discuss earbud design factors and our approach to prioritize comfort in creating Pixel Buds Pro, launched in July 2022. We contrast form factor differences with previous generation earbuds, Pixel Buds A-Series, released in June 2021. Measuring user comfort is tricky as ear geometry varies by gender, age, and ethnicity, and results in individual differences in fit. Because comfort is subjective, self-reported comfort ratings can differ based on activities when earbuds are worn and duration of wear. Ratings can also be biased by prior earbud ownership. To optimize design of the Pixel Buds Pro for physical comfort, our research considers comfort during a range of initial, active, and prolonged wear activities and contrasts design choices to accommodate functionality and comfort. As part of this study, we look at distinctions in marketing and consumer reviews that reflect design choice differences. While this study focuses on earbud design we propose that our approach might be generalized to wearable and other areas for researchers who are challenged with adapting product design based on evolving user and technology needs.

The effect of cognitive load and the detection response task on steering behaviour during day and night-time driving

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Previous studies have shown that visually distracting activities that take drivers' eyes-off-road result in a higher number of large steering wheel corrections (revealed by reversal rates) compared to small "micro-corrections", which are normally associated with cognitively demanding, non-visual tasks (Kountouriotis et al., 2016). This study investigated the effect of a visual Detection Response Task (DRT) and non-visual versions of the n-back task (1-back, 2-back) on the driving behaviour of two groups of drivers (Young: Average age 22.30, and Older: Average age 65.82), who completed a driving simulator study during the day and night-time conditions. Results showed that whilst the number of small reversals (0.5°) increased with the n-back task in the absence of the DRT, adding DRT reduced the effect of the n-back, increasing the number of large reversal rates (2.5°). The effect of day and night-time conditions on driving behaviour, and the implication of these findings on road safety will be discussed.