Public Summary

Beyond the Numbers: Designing a Tangible Reflection Tool for Recovery-Aware Athletes

Lucia Karelová

Athletes are constantly surrounded by data. From heart rate variability and sleep scores to stress levels and training readiness, wearable devices and health platforms offer many insights that promise to optimize performance and support recovery. However, in practice, many athletes find these systems overwhelming or even counterproductive, especially when the numbers don't align with how they feel. A smartwatch may suggest they're fully recovered while their body feels exhausted, or it may advise rest when they feel energized and motivated to train.

This frequent misalignment between objective data and subjective experience poses a design challenge in modern sports technology: while metrics are more accessible than ever, interpreting them meaningfully remains a struggle. Reanalysis of interviews from *Is it Just a Score? Understanding Training Load Management* (Karahanoğlu et al., 2024) showed that athletes often feel disconnected from their data. Some ignore it, others blindly follow it, but few take the time to truly reflect on what the numbers mean in relation to their personal state. This disconnect can result in mistrust, disengagement, or over-reliance on algorithmic advice, ultimately undermining athletes' sense of autonomy.

Rather than developing yet another app, this project set out to explore a different kind of solution, one that supports personal interpretation, habit formation, and reflective interaction. The guiding research question became:
"How can a tangible product visually represent training load and recovery data in real time to reflect both objective metrics and subjective user feedback, improving trust and understanding in training load management?"

To answer this question, the project combined research on related work, a reanalysis of interview data, and a user and context analysis to examine when, where, and how athletes interact with recovery tracking data in their routines. From the literature, it became clear that the design needed to support autonomy, competence, and relatedness, and avoid paternalistic strategies often seen in persuasive technologies. These insights highlighted the need for a more embodied and self-directed form of interaction.

As a response to these findings, the project turned to tangible interaction as a means to promote deeper engagement with data. The physicality of the product was envisioned not just as an interface, but as a way to enhance understanding, deepen the experience of inputting lived experiences, and ultimately make the act of reflection more memorable and meaningful. This concept took shape in a scroll wheel mechanism embedded in a handheld, screen-free object (figure 1). The core idea is that as the user scrolls further away from the objective metric displayed on the product (via

a circular LED ring), the device introduces increasing resistance (a form of haptic feedback). This resistance encourages users to pause, creating a moment where they must feel and reflect on the alignment, or misalignment, between their internal state and what the data is telling them.

In conclusion, the thesis proposes a shift in how athletes interact with recovery data, moving from passive consumption of metrics to active, embodied reflection. By incorporating tangible interaction, the design fosters a deeper connection between subjective experience and objective insight, encouraging athletes to trust their intuition while still learning from their data.

Rather than replacing human judgment, the product supports it, empowering athletes to make decisions that are informed, personal, and context-aware. By making recovery physically engaging, the design transforms it from a background metric into a meaningful daily ritual.

Figure 1 The final visualisation of the product

References

Karahanoğlu, A., Coskun, A., Postma, D., Scheltinga, B. L., Gouveia, R., Reidsma, D., & Reenalda, J. (2024). Is it just a score? Understanding training load management practices beyond sports tracking. Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24), 18. https://doi.org/10.1145/3613904.3642051