

Ask the Consumers: What Should be on IoT Privacy & Security Labels?

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Study Design

- Our between-subjects study aims to **compare user experience using IoT privacy and security labels with three levels of complexity**
- We recruited a gender-balanced sample of **60 US adult IoT device owners** on Prolific to take a survey
- The survey measured how well labels of low, medium and high complexity performed in:
 - Helping participants **gauge the acceptability** of a device's security and privacy
 - Facilitating **comparison of security and privacy** of across **3 different devices**

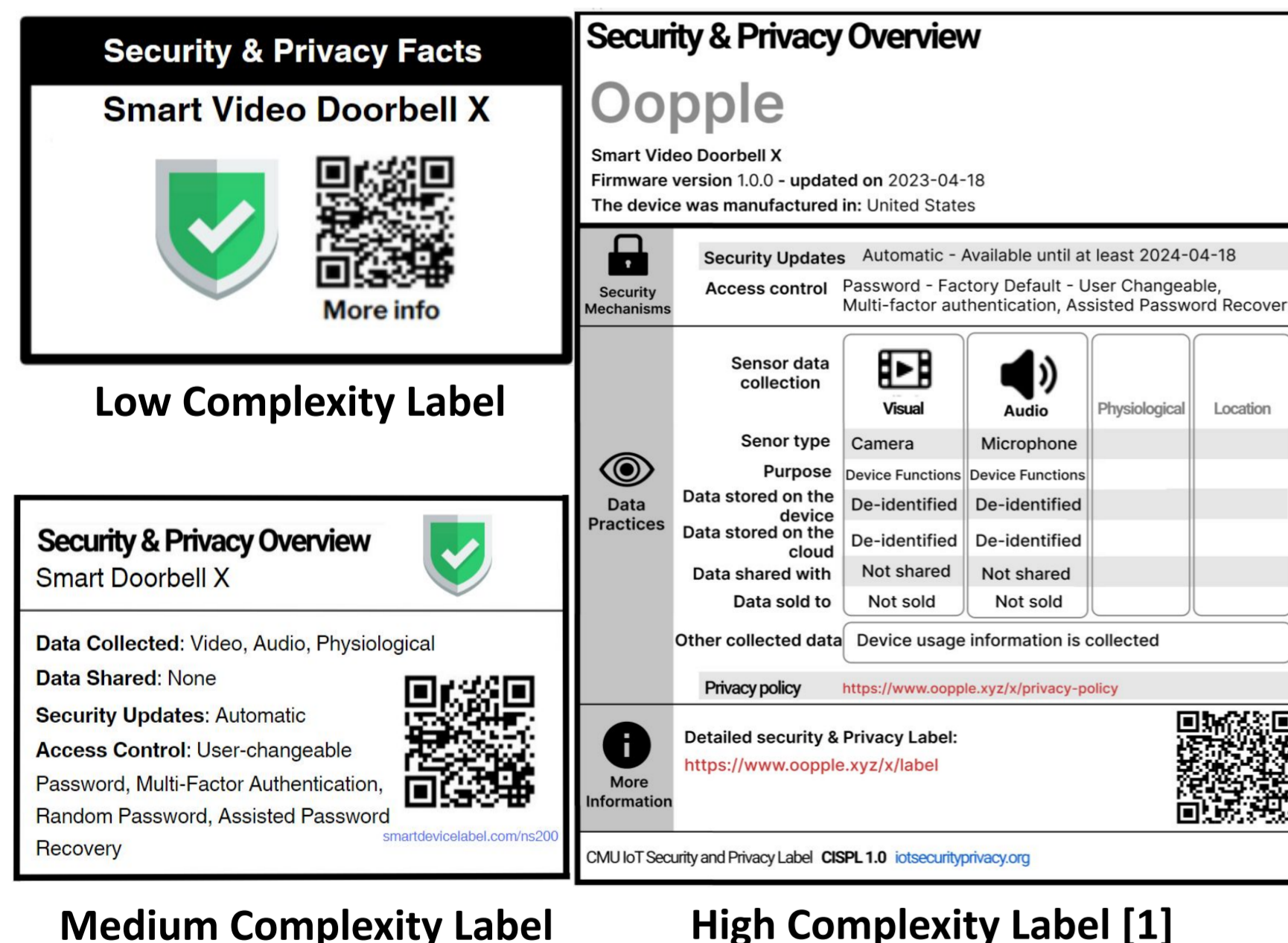
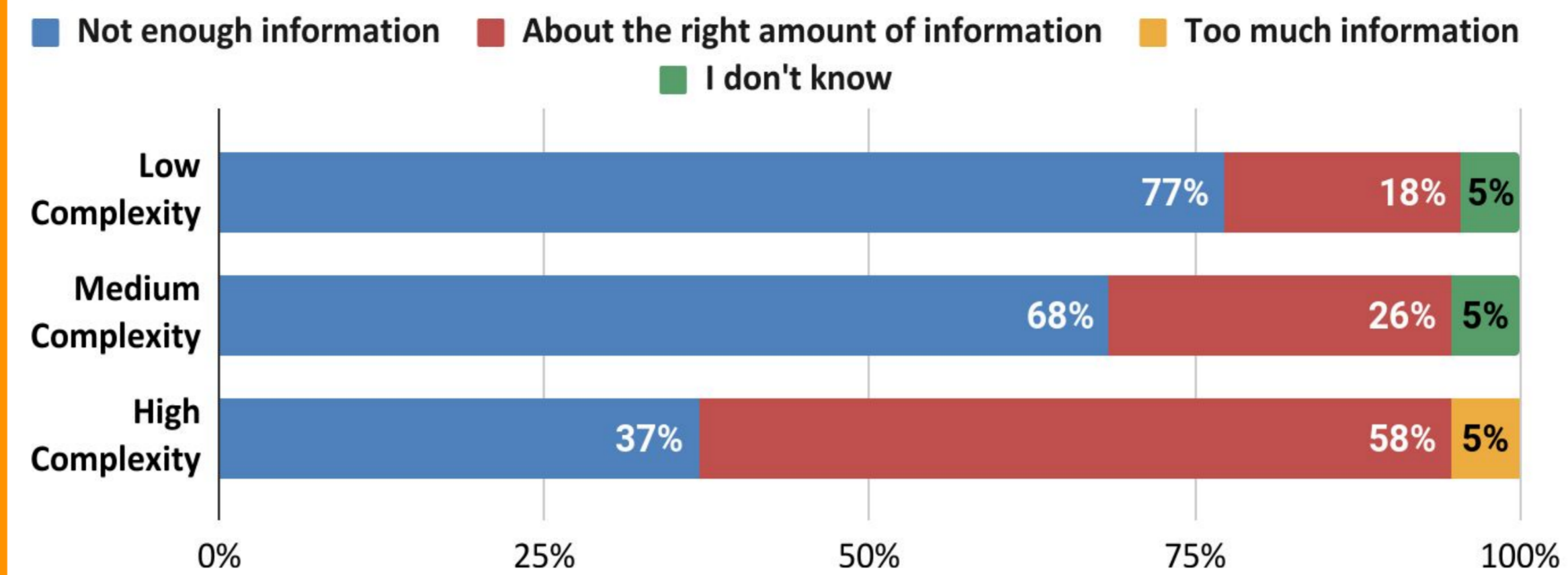


Figure 1: IoT Security/Privacy Labels

We tested three versions of labels designed for product packaging. Each contains a QR code designed for consumers to scan for more detailed information. However, the QR codes were non-functional for our study.

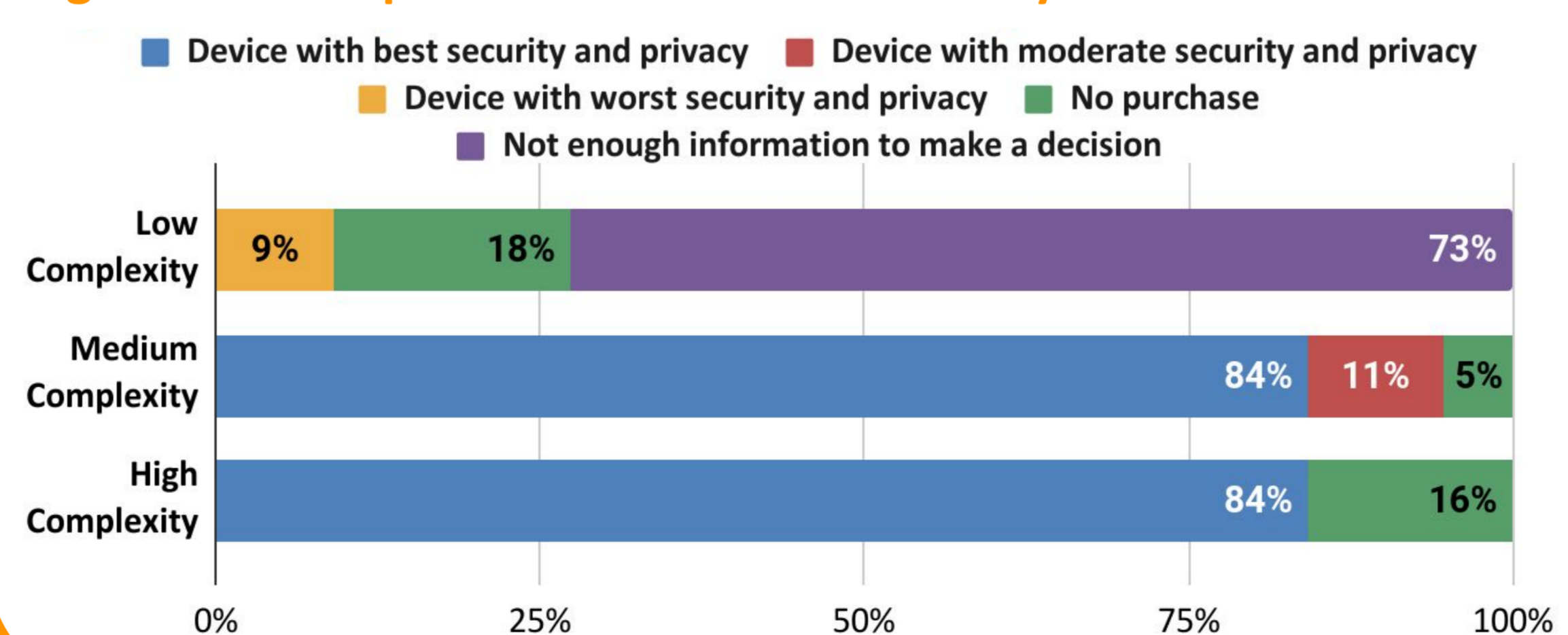
Figure 2: Participants' Perception on the Level of Information on Each Level



Performance vs Preference

- Participants consistently indicated that they preferred seeing **more information** on labels (fig 2).
- Given 3 options, participants **performed equally well** with **medium** and **high** complexity labels at identifying the **device with best security/privacy** in terms of **purchasing preferences** and **best data protection practices** (fig 3, 4).
- **High** and **medium** complexity labels are both **better** than **low** complexity labels at informing consumers. (fig 3, 4).
- **Conclusion: Medium complexity labels fulfill information needs, but consumers are still interested in seeing more information.**

Figure 3: Participants' Choice of Devices They Would Like to Purchase

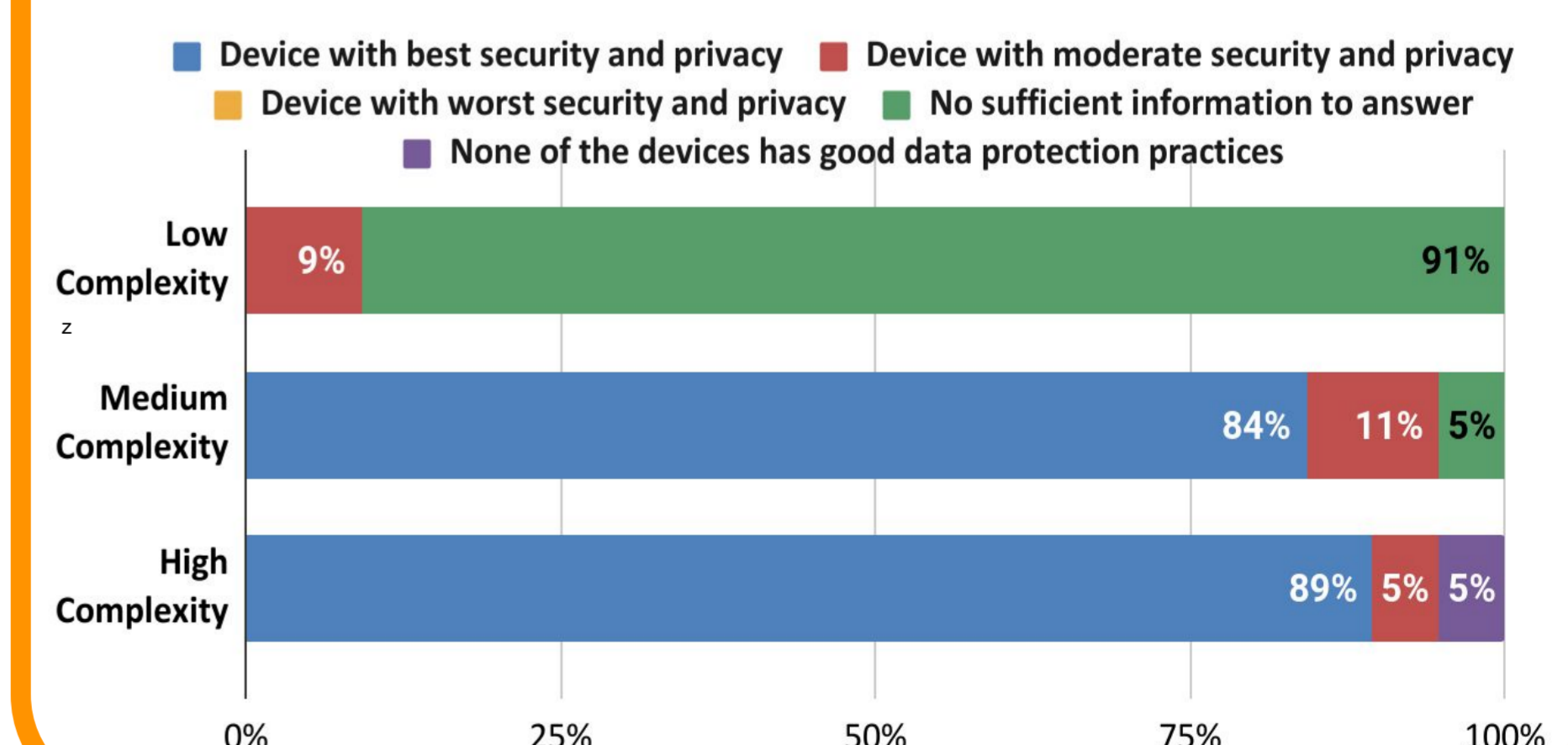


“Listing basic information on a label ... even if sparse, would be more helpful than a QR code. Yes, it's meant to take you to a page with more information, but surely there's a way to fit more information on here to give people more assurance.” — Participant who viewed low-complexity labels

How do Label Elements make an impact?

- **Checkmark/Shield:** Only 1 participant out of 60 felt it was helpful.
- **Low complexity group:** **QR code** was helpful to 7 out of 22 participants
- **Medium complexity group:** 8 out of 19 people found **Access Control** helpful.
- **High complexity group:** participants found **Data Shared** (9 of 19), **Data Sold** (9 of 19), and **Data Collected** (7 of 19) helpful.
- More participants in **low** (12 of 22) and **high** (11 of 19) complexity groups said they would/did scan the **QR code**, compared to 4 of 19 in **medium** complexity group.

Figure 4: Devices Reported by Participants To Have the Best Data Protection Practices



[1] P. Emami-Naeini, J. Dheenadhayalan, Y. Agarwal, and L. F. Cranor, “An Informative Security and Privacy ‘Nutrition’ Label for Internet of Things Devices,” *IEEE Security & Privacy*, vol. 20, no. 2, pp. 31–39, Mar. 2022