

## **Usability assessment of an adjustable wheel-locking system for a child's wheelchair**

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### **Abstract**

**Background:** ROC Wheels is a non-profit organization that provides an innovative adjustable wheelchair to children of all ages in developing countries. **Objective:** Wheelbase width is a factor that affects a wheelchair's movement through small spaces and the effort required for self-propulsion. In order to better serve all recipients of this wheelchair the wheelbase width must be reduced. Researchers have been tasked to redesign the braking system, which will reduce the wheelbase width. The proposed design has moved the current push-to-lock brake from a support bar to the main wheelchair frame. The aim of this project is to evaluate the usability of this proposed locking system. **Methods:** Children and caregivers at local therapy facilities will evaluate the proposed braking system based on product usability outlined in SUS and PSSUQ questionnaires. Additionally the system will be evaluated to ensure that reach distances and grip forces are adequate for users. The results of these tests will help researchers determine necessary design changes for improved usability. **Impact:** This project can impact the society where these children live by improving their quality of life and allowing them mobility alongside their families. This research can advance brake-system design and provide design recommendations to the wheelchair industry.

### **Keywords**

Usability, Wheelchair, Children, Product Design

### **Acknowledgements**

The authors would like to thank the National Science Foundation for their help in funding this project (Award Number DGE-1049562), and ROC Wheels for providing the wheelchair.