Independent Cycling for People with Down Syndrome

Finding why and how design interventions can be used to improve the cycling independence of person with Down syndrome.

Public bachelor thesis summary
W.W. Westerveld - Industrial Design Engineering
University of Twente - Netherlands
Van Raam B.V.

UNIVERSITY OF TWENTE.

vanraam®
Let's all cycle

Introduction

Van Raam is a firm situated in Varsseveld that designs, manufactures, and trades adapted bicycles. These adapted bicycles promote the mobility, independence, and participation in society of many different target groups by allowing persons with disabilities to cycle (Van Raam B.V., 2022). Although the majority of Van Raam's customers use an adapted bicycle due to a physical disability, there are also people with cognitive disabilities who benefit from the assortment. There is little documentation on the cycling needs of people with cognitive disabilities within Van Raam. For this reason, and because van Raam may benefit from better meeting the needs of this target group, people with cognitive disabilities, specifically people with Down syndrome, are the focus of the research.

According to the findings of research interviews, many persons with Down syndrome value the ability to cycle independently (INT7), (Stichting Downsyndroom, 2013)). Adapted bicycles and other design interventions can help to meet this need for independence (INT1). As a result, the aim of the thesis research was to find out why and how design interventions should be used to help people with Down syndrome to become more independent cyclists, as well as how these interventions could add to the value of the Van Raam assortment.

Research approach

To reach the aim, the research is divided into four phases. First, in the analysis phase, the research topic is studied through a literature review and interviews. Second, the first ideation cycle phase is used to further research the topic and test potential design interventions with people with Down syndrome, their families, and experts such as physiotherapists. Third, the second ideation cycle phase expands on the previous phases' findings by visiting and testing with the target group and experts again. Fourth, the test and evaluate phase is used to determine whether the promising research findings that have not yet been sufficiently confirmed are reliable. After completing all four phases, the findings are incorporated into the conclusion and discussion.

Results

It is made clear why design interventions should be used to help people with Down syndrome become more independent cyclists through the four phases. The main justification for this is the fact that people with Down syndrome, as well as their parents and caregivers, benefit from increased cycling independence. These benefits include more freedom for a person with Down syndrome to go somewhere on their own and a lighter caretaking liability on parents and other caregivers (INT8).

Additionally, it is discovered how design interventions should be used to help cyclists with Down syndrome in becoming more independent. This can be accomplished by incorporating the factors that increase this independence into design interventions. An improved ability to apply for municipal funding of a bicycle through the Wmo regulations, repetitive cycling training, and accounting for the longer reaction time that people with Down syndrome require are a few factors that increase the cycling independence of people with Down syndrome ((INT8), (INT10)). Another factor that improves cycling independence is the ability of parents to intervene while cycling with their child in traffic, as well as proportional and step-by-step learning (INT8). A first design interventions that incorporates these factors is a parent-child tricycle tandem with two steers, both for the cyclist in the front and in the back, to allow a child to better practice cycling. Other design interventions are a tandem bicycle that converts to a one-person tricycle, an adaptable bicycle for step-by-step learning, and a regular tricycle. Some of the aforementioned design interventions are depicted in figure 1.

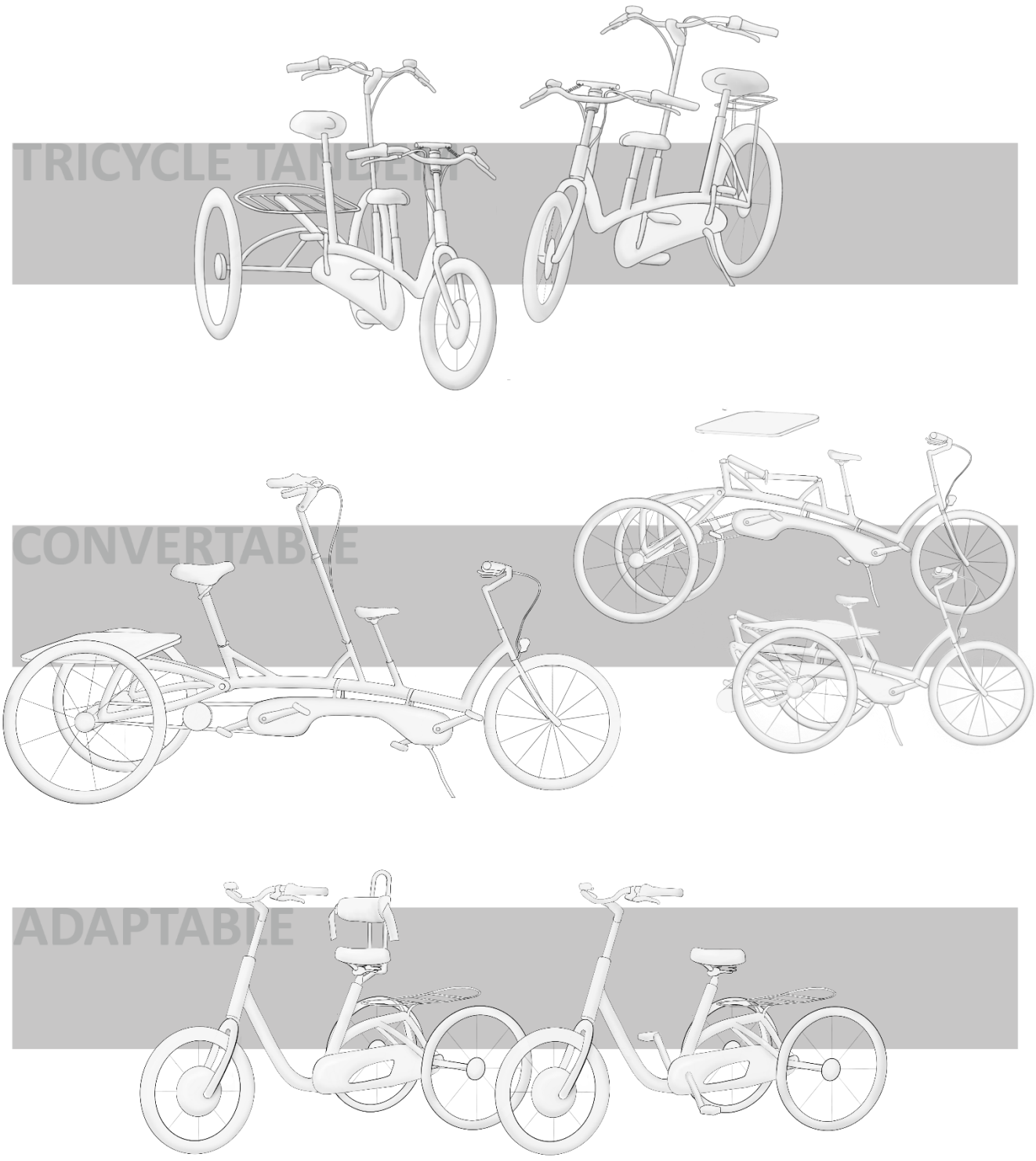

Figure 1: Design interventions

Finally, the study shows how design interventions that increase people with Down syndrome's cycling independence could increase the value of the Van Raam assortment. The design interventions, in the first place, increase the value of the Van Raam assortment because they shed light on how the business could make a profit from selling in-demand bicycles. Additionally, the design interventions are beneficial because they give the business knowledge about the target market and an understanding of how people with Down syndrome can gain from various interventions.

As a result of this study, it is advised that Van Raam first investigates the promising subjects that have been recommended for further study. Some of these subjects include the other syndromes and cognitive disabilities that a tricycle tandem or duo-bicycle with two steers may be of benefit to, as well as the advantages of a back support or higher steer when learning to ride a bicycle (INT10). Additionally, it is advised to investigate the long-term impact of tandem tricycle riding on the cycling independence of individuals with Down syndrome.

References

J. (2022, May 4). INT7. (W. Westerveld, Interviewer)

M. (2022, June 8). INT10. (W. Westerveld, Interviewer)

M. (2022, May 6). INT8. (W. Westerveld, Interviewer)

S. (2022, April 14). INT1. (W.W.Westerveld, Interviewer)

Stichting Downsyndroom. (2013, 1 10). *Leren fietsen.* From www.downsyndroom.nl: https://www.downsyndroom.nl/download/algemeen/readerfietsen.pdf

Van Raam B.V. (2022). *About Van Raam*. From vanraam.com: https://www.vanraam.com/en-gb/about-van-raam/about-us