

Testing and improving the usability of the Minimonkey twin carrier

Kaitlyn Kuiper, Bachelor Industrial Design, University of Twente, The Netherlands

Minimonkey, a baby-product company, is developing a twin-carrier. The baby-carrier market is lacking an ergonomic twin-carrier, usable with new-borns. Besides ergonomic, the carrier should be user-friendly. In this research the following question will be answered: What improvements are needed for the design of the Minimonkey twin-carrier concerning the usability and ergonomics?

Several analyses are executed. A market research is done, possible use scenarios are made and research is done about the characteristics of usability. Guidelines for the design are collected from the results. The guidelines are used to define the usability characteristics that apply on the design of the twin-carrier. The chosen characteristics are efficiency, effectiveness and satisfaction. The characteristics simplicity and consistency have influence on efficiency and effectiveness. The focus of satisfaction lays on comfort, safety, adaptability, flexibility and volume. The physical ergonomics of a baby are important as well, besides the usability. Literature research is done about the ergonomics. To ensure an ergonomic posture the baby has to be supported at several body parts. The baby's leg should be supported till the knees, to ensure the M-position. This is important for the development of the hip. The back should be supported with an unstructured body panel, so the spine has a natural curve. The head should be supported as well.

Minimonkey designed two twin-carriers. The so called one piece carrier and the two piece carrier, which are both possible to use with a separate waistband. The waistband contains little seats for the babies, therefore the total weight is divided on the whole upper body instead of the shoulders alone. The support of the ergonomic posture is evaluated by an expert. There is concluded that the babies are supported well as long as the seats are as slight support. Besides that, it is important that the babies are carried at the right height. Next two usability evaluations are developed to criticize the usability characteristics and to choose between the two designs. The first evaluation focusses on efficiency, effectiveness, simplicity, comfort, flexibility and errors. This test will be executed with baby-dolls. The method that is used is a controlled experiment with questioning and observations. The level of instruction and the carrier that is used first are the major variations. The level of instruction is tested between subject and which carrier is used first is tested within subject. The conclusion can be made from the results that the one piece carrier has the most potency for further development. The main reason is the simplicity, which has as consequence that the efficiency and effectiveness are better of the one piece carrier. At the second test the one piece carrier is evaluated by twin parents with real babies. The focus of this test lays upon the adaptability of the carrier concerning the size of the parents and of the babies. Besides that the parents will be asked about their sense of safety and the volume of the carrier. There will be also paid attention to the comfort, simplicity and flexibility. There is evaluated if the sense of safety is increased with the waistband fastened on the carrier. From the results can be concluded that the fastened waistband is an improvement, however it looks like the little seats does not fulfil their function anymore. More research is needed about this. From the results can also be concluded that the adaptability of the shoulder straps should be easier. Another improvement is needed about fastening the babies while tightening the shoulder straps, this possibility is not clear to the users. Some users tend to put the legs of the babies in the cloth, it should be clear that the legs are supposed to be outside the cloth. With these conclusions Minimonkey improved the design of the twin-carrier. The buckles are replaced by other buckles, to improve the adaptability. The seats are removed from the waistband. The waistband appeared functional without the seats. Several points of improvement could not be

solved in the design. Carrying the babies at the right height, fasten the babies by changing the length of the shoulder straps and putting the legs outside the cloth are those points. There is also expected that the waistband will be carried at the hip instead of in the waist. These points will be emphasized in the instruction manual.

Research is done about important parts necessary for a clear manual. With the results of this research requirements are formed. With the requirements a manual is designed. An observation is done with the manual. With the result that the pictures about the height of the carrier are hard to understand. An improvement is made with the pictures in the final version of the manual. The new version is not yet tested. This is relevant for future research. The other pictures were understood in a desirable manner.