

# PERSONALISING BICYCLE DESIGN TO INCREASE PSYCHOLOGICAL OWNERSHIP FOR RENTAL SERVICES

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## Introduction

In cooperation with The Student Hotel, the role psychological ownership could have concerning the behaviour towards rental bicycles was investigated. With more rental services appearing in the current sharing economy (Hawlitcshek, Teubner & Gimpel, 2016; Hamari, Sjöklint & Ukkonen, 2015) this research could have useful results for other parties.

## Psychological Ownership

Psychological ownership seems like an interesting factor to study. It is, as explained by Pierce, Kostova & Dirks (2001): **“The mental state in which individuals feel that the target of ownership is ‘theirs’.”** When people feel ownership over an item they tend to be extra careful and protective over that item (Hernandez 2012; Baer & Brown 2012). This is useful for rental services, as careless behaviour with rented services causing them to become less sustainable, more expensive, and they have less user satisfaction (Baxter, Aurisicchio & Childs, 2015). Preventing would be valuable.

Studies by Baxter et al. (2015) have provided designers with a framework that includes several affordances related to psychological ownership. Through several routes, the perceived ownership of a bicycle or any other item can be influenced, though it is uncertain what works best in what situation. It is their work that we used in the setup of our study. (Brondijk, J., Fransen, P.M.C., van Iterson, H.C., Pouw, S.J. & Vriens, C., 2020)

## Research question

This resulted in the following research question:

**“Can personalisation achieve a higher feeling of psychological ownership (for rental bicycles)?”**

## Study setup

The study setup looked as shown in figure 1. The psychological ownership surveys are the main source of our data. The setup and questions of these surveys are based on (Dyne & Pierce, 2004). The pattern preference survey's data was used as an input for the intervention, as well as a way to collect some demographic data about the participants.

The intervention consisted of a physical meeting with the participant, in which they could interact with the bicycle. During this, they had to pick their favourite bike and explain their picking process.

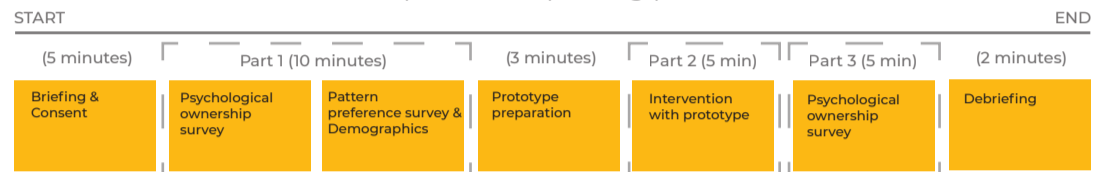


Figure 1. Study setup showing the different steps and estimated time needed.



## Prototype

This image shows two of the prototypes used in the intervention of our study. It is a tailored laser cut patterned inner frame, which has been painted black to fit the TSH aesthetic.

In total, there are six different frame designs. The design that the participants got to see during their test, was based on the pattern-preference survey that they had to fill in before the study. The pattern they preferred most out of the six, was placed in one of the frames; the most contrasting one in the other.

Figure 2. Prototype in use (image by Sander Pouw)

## Data collection

This study was conducted with a total of 16 participants. Four (4) of these were part of the control group, who were part of an intervention without prototypes. This was done in order to check if the prototypes were the reason for any possible changes in perceived psychological ownership, or if the intervention itself was the cause.

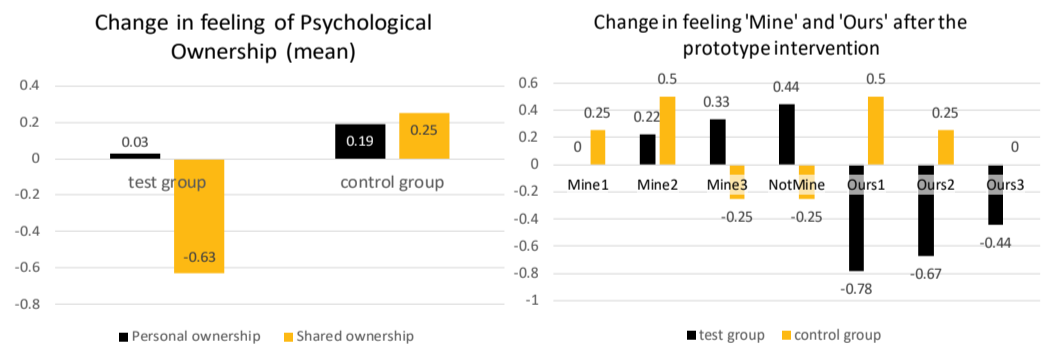
## Results

The results of the before and after intervention surveys were compared and analysed using a one-way ANOVA test ( $F(1,13) = 6.228, p = .027$ ). It showed a statistically significant difference between the test and control group ( $p = .027 < p = .050$ ). Thus, it can be concluded that the design had an effect.

To understand if this was an effect on the perceived psychological ownership, a paired-samples t-test was used on the answers of the 5-point Likert scale questions posed in the surveys (graph 1). It showed a relatively steep decrease in the mean value for the feeling of 'this is 'OUR bicycle''. A clear difference can be seen when comparing the test and control groups, but no statistically significant change was found.

By looking at the questions from the psychological-ownership survey separately, we hoped to get more insight into the changes seen in graph 1. The results of this can be seen in graph 2. Regrettably, none of the variables, except for 'Ours\_1' showed a significant change after a one-way ANOVA test ( $F(1,11) = 7.587, p = .019$ ).

Finally, to complement and help explain the results of our quantitative data, some qualitative data was collected. It was useful in understanding what other factors might have influenced our test. In the charts shown in figure 3., it becomes clear that aesthetics and imperfections of the bikes did in fact influence the choice of over half of the participants.



Graph 1. Change in feeling of psychological ownership comparing the control and test group using the mean change. (Brondijk, J., et al., 2020)

Graph 2. Change in feeling 'mine' and 'ours' after the prototype intervention, using mean change. (Brondijk, J., et al., 2020)

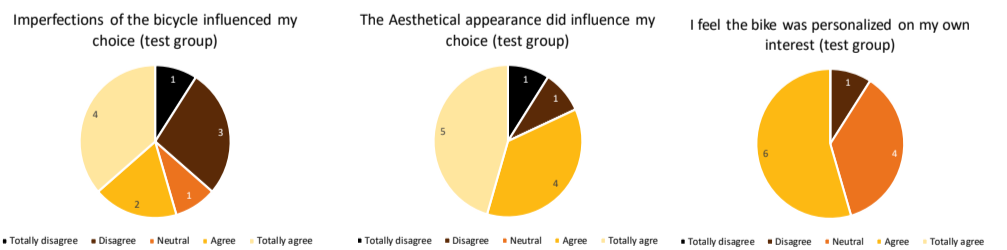


Figure 3. Pie charts of qualitative data gathered after the intervention. (Brondijk, J., et al., 2020)

## Discussion & Conclusion

The statistical insignificance of most of the data makes it hard to draw a strong conclusion if the personalisation achieves a higher feeling of psychological ownership. The intervention does seem to increase the feeling of personal ownership and decrease the feeling of shared ownership, but more research is needed to confirm this.

Future research could investigate other forms of personalisation and test the effects that those might have. It could also continue investigating the effects of feeling more or less personal and shared ownership, and how that influences the behaviour towards the rental bikes.

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