The Perception on Cargo Bike-Sharing Systems in Groningen

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Abstract

Cargo bike-sharing systems could help with the decrease of gas emissions in cities if people are willing to make use of these systems. A lot of research has been conducted on bike-sharing systems. However, research on the perception on cargo bike-sharing is currently lacking. In the present study, we investigate whether different goal frames, biospheric or hedonic, can influence the attitude and the perceived behavioural control (PBC) towards cargo bike-sharing and how the attitude affects the intention of using one, using the Goal Framing Theory. Based on previous research, we propose that biospheric goal framing will have the most positive impact on the attitude, followed by hedonic goal framing and then no framing. The attitude will result in a higher intention of using cargo bike-sharing. Furthermore, goal framing will result in a higher PBC of individuals than no framing. We conducted a between-subjects experimental design (N = 83), where we explored the effects of differing goal frames on the attitude and the PBC to use cargo bike-sharing systems in Groningen and how the attitude influences the intention of using cargo bike-sharing systems. Results showed that there are no differences in the goal frames and the attitude and PBC, contradicting previous research. The attitude did positively influence the intention of using cargo bike-sharing systems, which is in line with previous research. There are several limitations to be considered in future research, which can lead to more insight into the perception on cargo bike-sharing systems.

Keywords: cargo bike-sharing system, Goal Framing Theory, attitude, intention, perceived behavioural control

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Several problems are threatening environmental sustainability, including urban air pollution (Steg & Vlek, 2009). Switching from cars to cargo bikes helps reduce greenhouse gas emissions and thus improves environmental sustainability, as cargo bikes are low-carbon transportation in contrast to cars (Hess & Schubert, 2019). The municipality of Groningen is planning to implement cargo bike-sharing systems in the city to help decrease these emissions.

Bike-sharing systems are well known and there has been plenty of research concerning this topic (Fishman, 2016; Shaheen, Guzman & Zhang, 2010; Wang & Wang, 2021). Cargo bike-sharing systems, however, have not yet been widely researched. Specifically the attitude towards cargo bike-sharing systems and how this attitude can be influenced needs further investigation. The Goal Framing Theory of Lindenberg and Steg (2007) can help explain how an attitude might alter due to the way information is processed by an individual. The perceived behavioural control (PBC), whether someone has the feeling they are able to perform a behaviour (Ajzen, 1991) may also be changed through different factors (Lindenberg & Steg, 2007). Can we influence the attitude of individuals in a way that their attitude towards cargo bike-sharing systems will be more positive if we introduce them to cargo bike-sharing systems with different scenarios, highlighting the environmental or personal benefits? Is there a possibility that this results in a higher intention of actually using one? And can the PBC be altered when presenting information in different ways?

This study aims to shine a light on how different goal frames will affect the attitude and the PBC towards making use of a shared cargo bike system in Groningen. Furthermore, we are looking into the relationship between the attitude towards, and the intention of making use of a cargo bike-sharing system.

Cargo Bike-Sharing Systems

A cargo bike is a bicycle with a large front-mounted box that is designed to transport greater goods, such as food, furniture, and even children (Becker & Rudolf, 2018; Hess & Schubert, 2019; Riggs, 2016). By implementing a cargo bike-sharing system, individuals no longer need to purchase a cargo bike to use them. This heightens the intention of using a cargo bike (Becker & Rudolf, 2018).

Sharing systems are already widely used for normal bikes (Fishman, 2016). Users of the bike-sharing systems can pick up and drop off bicycles at docking stations in their city instead of buying a bicycle. The main benefit reported by shared bike users is convenience because they can move more easily and faster around the city when using a bike (Fishman et al., 2013). This is especially the case for cities with high population densities and diverse land use (Schwanen et al., 2004). Although it seems intuitional that the increase in cycling decreases the use of cars, this is not necessarily true. An explanation for this is that most individuals who have switched to using shared bikes used public transportation or walking beforehand (Fishman, 2016). Thus, the use of bike-sharing systems does not automatically have a big impact on the reduction of car use in cities.

Cargo bikes, unlike normal bikes, could be well able to help with the reduction of car use and thus the reduction of greenhouse gas emissions, since cargo bikes are mostly used as a substitution for cars (Becker & Rudolf, 2018). With a sharing system for cargo bikes that is similar to the bike-sharing system, the usage of cargo bikes in cities can be stimulated, which, as mentioned above, might be a promising solution to decrease greenhouse gas emissions.

The Goal Framing Theory

Switching from a car to a cargo bike can be considered pro-environmental behaviour as it helps with the sustainability of the environment. The reason why individuals choose to engage in pro-environmental behaviour can be partly explained by the Goal Framing Theory

of Lindenberg and Steg (2007). The Goal Framing Theory suggests that people have goal frames that outline the way they process information taken from the outside and act upon it (Onel & Mukjerjee, 2017). These goal frames are affected by values that individuals hold and determine to which extent they are accessible in certain situations (Steg et al., 2014).

Three different goal frames have been defined: hedonic, gain and normative (Lindenberg & Steg, 2007). People with an activated hedonic goal frame focus on what will affect their mood and pleasure. If it makes them feel good, they are stimulated to engage in a specific behaviour. Improving one's resources is the focus of individuals with an activated gain goal frame. The last goal frame, normative, focuses on how to act appropriately; what someone ought to do. The normative goal frame is mostly related to both pro-environmental and altruistic behaviours (Steg et al., 2014), since engaging in one of the two behaviours can be considered the right thing to do. This study will primarily examine the pro-environmental side of the normative framing, which is also seen as biospheric goal framing, as we are looking into the concern with the environment (pro-environmental behaviour) and not into the concern of others (altruistic behaviour). Since using a cargo-bike can be considered pro-environmental behaviour, someone with an activated normative goal frame will likely have a more positive attitude towards cargo bike-sharing systems than someone with another activated goal frame because it is the appropriate thing to do concerning the environment (Lindenberg & Steg, 2007).

Even though the normative goal frame is mostly related to pro-environmental behaviour, the hedonic and gain goal frames can also increase pro-environmental behaviour if a particular behaviour is presented as enjoyable or profitable. Pro-environmental behaviour is, however, often perceived as being less pleasurable or profitable than non-environmental behaviour (Steg et al., 2012). Concerning the current study, this could mean that even though

cargo bikes are presented as fun and easy to use, the benefits of using a car still outweighs the benefits of cargo bike-sharing systems for some individuals.

The goal frame that is most focal, or active, influences the cognitive processes the most. The other two goal frames can increase or decrease the strength of the focal goal, depending on whether they are congruent with the focal goal frame (Lindenberg & Steg, 2007). For example, if someone with an activated normative goal frame engages in pro-environmental behaviour that is presented as enjoyable, the hedonic goal frame increases the focal goal frame. The focal goal frame influences what attitudes become cognitively most accessible. Thus, goal frames have an impact on the attitude, which is the attitude towards making use of cargo bike-sharing systems in this case. We will be looking into hedonic and biospheric framing and how they will influence the attitude towards cargo bike-sharing systems in the present study.

Attitude and Perceived Behavioural Control

As mentioned in the previous section, goal frames are likely to influence attitude (Lindenberg & Steg, 2007). Furthermore, the theory of planned behaviour proposes that attitude, subjective norms, and PBC can predict the intention of performing a specific behaviour (Ajzen, 1991). In the present study, this would mean that a positive attitude towards using cargo bikes will likely lead to a higher intention of actually using one. This is in line with a study by Yarimoglu and Gunay (2019), whose results demonstrated that attitudes towards green hotels have an impact on the intention of visiting one.

In addition to attitude, PBC is a variable in the theory of planned behaviour. It is the perceived ability to perform a particular behaviour (Steg & Nordlund, 2019). This variable influences whether an individual has the intention to engage in pro-environmental behaviour (Steg & Nordlund, 2019; Sun et al., 2019). Control beliefs and perceived strength are included

in PBC, where control beliefs are factors that are needed to perform a particular behaviour and perceived strength is the individuals' perceived ability to control these factors.

An individual with high PBC feels like they are well able to engage in a particular behaviour, while someone with low PBC has the perception they are unable to do so (Steg & Nordlund, 2019). Whether an individual has high or low PBC depends on both situational and internal factors (Yu et al., 2018) that can facilitate or prevent said behaviour. If an individual believes they have more means and opportunities and less expected hinders, their PBC will be stronger. Furthermore, the way information is presented or framed, can influence the PBC, as it is able to highlight different factors that can facilitate a behaviour or not (Lindenberg & Steg, 2007). For example, if a cargo bike-sharing system is presented with a hedonic frame, focusing on how profitable and easy it is to use a cargo bike, it can highlight the fact that it is not that difficult to use, which can increase the PBC of an individual (Sigurdardottir et al., 2013). When presenting information with a biospheric goal frame, highlighting that it is the right thing to do and beneficial for the environment may cause the individual to think more in possibilities rather than in problems, which can increase the PBC. In this case, it would mean that different ways of framing information, with a biospheric or a hedonic frame, could increase the PBC concerning cargo bike-sharing systems of an individual.

Current study

In the present study, we intend to see if different goal frames: biospheric, hedonic, or no frame, have an impact on the attitude towards using cargo bike-sharing systems in Groningen, which is seen as pro-environmental behaviour. Furthermore, we study if the attitude influences the intention to use a cargo bike. The effect of the different goal frames on the PBC on cargo bike-sharing systems will be investigated as well.

Aforementioned, individuals with an activated normative goal frame are most likely to have a positive attitude towards performing pro-environmental behaviour in comparison to the

other two goalframes (Steg et al., 2014). An individual with an activated hedonic goalframe, however, may also have a positive attitude towards pro-environmental behaviour if it is presented as enjoyable or accessible (Steg et al., 2012), even though it may not be as strong as the biospheric goal frame. This could mean that information that is presented in a biospheric or hedonic goalframe will have a more positive effect on the attitude than presenting it with no goalframe at all. Therefore, the following hypotheses are proposed:

Hypothesis 1: Biospheric goal framing will result in the most positive attitude compared to hedonic framing and no frame.

Hypothesis 2: Hedonic goal framing will result in a more positive attitude regarding cargo bike-sharing systems than no goal framing.

In the theory of planned behaviour attitude does influence the intention, as results of Greaves et al. (2013) demonstrated in a study exploring environmental behaviours in the workplace. Due to this and the earlier mentioned theories, the following hypothesis is proposed:

Hypothesis 3: There will be a positive correlation between attitude and intention regarding making use of cargo bike-sharing systems.

Furthermore, as Lindenberg and Steg (2007) mentioned, different factors can facilitate or prevent the intention of performing a behaviour. When presenting information about cargo bike-sharing systems with a hedonic or a biospheric frame, this can increase the PBC of an individual (Sigurdardottir et al., 2013). This has led to the following hypothesis:

Hypothesis 4: Goal framing, biospheric or hedonic, will lead to a higher PBC compared to no framing.

Method

Participants

A total of 125^1 participants took part in this study, of which 83 were included in the analysis[2]. Of the participants, 51 (61.4%) were female, 31 (37.3%) were male and 1 (1.2%) participant identified as non-binary/third gender. Seventy-three and a half percent of the participants were between the ages of 20 to 29 years old and 53 (63.9%) participants had at least a bachelor's degree. Furthermore, 36 (43.4%) participants owned a car or had access to one. In addition, the location that was most represented in this study is Centrum, (36.1% of participants live here), and the least represented location was Ten Boer (1.2% of participants live here). With a chi-square test, we tested if there were any significant differences between the means of the different experimental conditions and the descriptive variables. The results showed that there were no significant differences between the means of the three-goal framing conditions, control, hedonic and biospheric, and gender ($X^2(4) = 4.36$, $p = .359$), age ($X^2(4) = 13.45$, $p = .200$), car ownership ($X^2(4) = 5.01$, $p = .278$), education ($X^2(4) = 8.36$, $p = .593$), and location ($X^2(4) = 10.52$, $p = .72$).

Research Design and Procedure

This study was a between-subjects experimental design exploring the effects of differing goal frames on the attitude, intention, and PBC to use electric cargo bike-sharing systems in Groningen. Participants were randomly assigned to one of three conditions. Conditions differed in the way in which cargo bike-sharing systems were framed in a short text presented to participants during the survey.

Initially, sampling was done by approaching potential participants in Groningen's city centre. Participants were only considered if their age exceeded 16 years and when they were actual residents of the city of Groningen. Before participants were referred to the survey, a short but general introduction to the study was provided. Next, we specified that participation was

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[1] We ran a Power Analysis for a fixed effect ANOVA, which showed that the preferred sample size would be 159 participants ($d = .25$, $\alpha = .05$l, $\beta = .80$).

[2] The participants that were excluded from the analysis either did not give consent, did not finish the survey, or did not answer the attention check correctly.

voluntary, anonymous and that withdrawal from the study was possible at any moment. Participants were invited to participate by handing out flyers with a QR code that led to the corresponding survey (see appendix A), which allowed participants to fill out the questionnaire at any given time. The survey was provided in two languages, both Dutch and English. Only participants that had indicated proficient knowledge of either language were considered during the data analysis. Furthermore, we communicated the estimated time of 10 to 15 minutes it took to fill out the survey. After the recruitment, the participants filled out the survey in their own time, where they first answered different question topics in the following order: informed consent, demographics, values, place attachment and ecological worldview, and then read one of the three scenarios. Subsequently, they answered questions about the text, attitude, intention, PBC, location, and travel behaviour. Afterwards, the participants' scores on values, place attachment, ecological worldview, attitude, intention, and PBC were measured.

During our data collection, new COVID-19 measures were introduced by the Dutch government. Due to those new circumstances, we changed our data collection method to recruiting participants online. We all sent the survey in different WhatsApp groups with people who live in Groningen and in a Facebook group called 'Free Your Stuff Groningen'. Ultimately, this resulted in a convenience sample for our study. We will discuss the implications for the data analysis of this approach in more detail in the discussion. This study, along with all the changes made in the data collection process, was approved by the Ethics Committee of the University of Groningen.

Materials

Description of Stimulus Materials

Participants' goal-frames were manipulated by presenting participants with one of the three texts, control, hedonic or biospheric, about cargo bike-sharing. In the control condition, participants were presented with a neutral text that explained cargo bikes and cargo bike-

sharing, describing cargo bike-sharing as a way of transporting goods. In the biospheric

framing condition, participants were presented with the general text, along with a

biospherically phrased text, using words such as the reduction of CO_2 emissions and noise

pollution or environmental preservation to emphasize the environmental benefits of using a

cargo bike. In the hedonic framing condition, along with the general text, participants were

presented with a hedonically phrased text, including words such as convenient, comfortable

and time-efficient to emphasize that using cargo bikes have personal benefits.

Description of Questionnaires

Multiple variables were measured in this study, such as values, place attachment and

ecological worldview, but these are not relevant for this thesis in particular. Beneath are the

scales described that are relevant for this thesis.

Attitude. To measure the variable *attitude* towards cargo bike-sharing, we used a

validated scale that measures attitude that was designed by Fishbein and Ajzen (1975). The

scale to measure attitude ($\alpha = .885$, $M = 3.85$, $SD = .83$) was a five-point Likert scale, and

included items such as "Using a cargo bike-sharing system is a good idea" and "In my

opinion, it would be desirable to use a cargo bike sharing system" (1 = *strongly disagree,* 5 =

strongly agree).

Intention. *Intention* towards cargo bike-sharing was measured by a validated intention

scale of Fishman, Lushin and Mandell (2020). It was a five-point Likert scale, and the two

questions for intention ($\alpha = .718$, $M = 3.42$, $SD = 1.10$) in this scale were "How likely are you

to use a cargo bike-sharing system in the future?" and "How likely are you to recommend the

use of cargo bike-sharing system to your friends or family?" (1 = *very unlikely,* 5 = *very*

likely).

Perceived Behavioural Control. Finally, participants' *perceived behaviour control*

was measured by a validated scale by Ajzen (2002). PBC ($\alpha= .663$, $M = 4.35$, $SD = .86$)

consisted of four items measured by a seven-point Likert scale. Examples of statements included in this scale are "Using a cargo-bike is easy for me." and "I have control over the ability to use a cargo bike" (1 = *strongly disagree, 7 = strongly agree).*

Manipulation and Attention Check

As a manipulation check, we asked participants to identify which main benefits of cargo bike-sharing were mentioned in their survey. The manipulation check consisted of one question with three possible answers. The question was: 'You have just read a short text about electric cargo bike-sharing systems. What were the main benefits of such systems mentioned in the text?'. The answer options were: 'Transporting goods', which was the right answer option for the control condition, 'Fun, convenience, time-efficiency and transporting good', the right answer option for the hedonic framing condition, and 'reducing CO2 emissions, environmental preservation and transporting goods', which was the right answer for the biospheric framing condition. We decided not to exclude those who answered the manipulation check incorrectly and merely used it to gain insight into whether our manipulation worked.

Furthermore, to check whether participants were paying attention, they were asked to choose the 'strongly disagree' option in one of the statements about cargo bikes. This question was integrated into the scale of PBC.

Statistical Analysis

To process the data and to perform the statistical analyses, we used IBM SPSS Statistics, version 28.0.0.0 (190).

To ensure that the analysis can be executed, we checked whether the assumptions for an ANOVA analysis were met. Firstly, our research design included random and independent samples, allowing for the independence of measures. Next, a Shapiro-Wilk test was run to test the assumption of normality. Results showed a significant p-value at an alpha level of .01 for

the dependent variable attitude within the biospheric condition, meaning the distribution in this group significantly differs from a normal distribution. As the assumption of normality is not met ($W(83) = .895$, $p < .001$), a nonparametric test is needed to analyse the data, namely the Kruskal-Wallis one-way ANOVA. After this, the data can be further analysed with planned contrasts.

To test the relationship between attitude and intention (H3), a correlation analysis was run between the two variables. As the assumption for normality was not met ($W(83) = .933$, $p < .001$), we looked at the non-parametric Spearman's correlation. Attitude and intention were both measured on interval scales, hence they would be suitable for a Spearman's correlation test. Additionally, Spearman's correlation assumes paired observations, which applied to our data as all participants included in the data answered the questions for both scales. Finally, Spearman's correlation assumes a monotonic relationship between the two variables. We plotted the variables attitude and intention against each other on a scatter plot, which showed there is indeed a monotonic relationship between the two variables.

A Shapiro-Wilk test was run to test the assumption of normality for the dependent variable PBC within the three goal framing conditions. A significant p-value was found, indicating that the assumption of normality is not met ($W(83) = .936$, $p <.001$). Because of this, the Kruskal-Wallis one-way ANOVA will be used to analyse if there are any differences between the means of the three conditions and the perceived behavioural control. Hereafter, a nonparametric test with planned contrasts will be run.

Results

Manipulation Check

We analyzed the manipulation check of the three different experimental conditions with a chi-square test. The results showed that there were significant differences between the means of the three groups, $X^2(4) = 32.3$, $p < .001$, which indicates that the manipulation was

successful (see table 1). This means that the different scenarios, control, hedonic and

biospheric, resulted in different answers to the question of which main benefits of cargo bike-

sharing were mentioned in the survey, matching the scenario participants were given.

Table 1

Manipulation check

	No frame	Hedonic frame	Biospheric frame
Transporting goods	13	7	3
Fun, convenience, time-efficiency and transporting goods	7	16	2
Reducing CO2 emissions, environmental preservation and transporting goods	6	7	22
Total	26	30	27

Goal Framing and Attitude

A Kruskal-Wallis one-way ANOVA has been performed on the data to test if there

were any differences between the three different framing scenarios and the attitude. There

were no significant differences between the conditions and the attitude, $H(2) = .088$, $p = .957$.

The results show that hedonic framing did not result in a more positive attitude towards using

cargo bike-sharing systems compared to no framing, which does not support hypothesis 1.

Furthermore, hypothesis 2 is also not supported, since biospheric framing did not result in the

most positive attitude towards using cargo bike-sharing compared to hedonic framing and no

frame.

Attitude and Intention

A non-parametric Spearman's correlation has been performed to test the relationship between attitude and intention. A moderate positive correlation was found, $r(81) = .58$, $p < .001$, 95% CI [.44, 1.00], which indicates that there is a positive correlation between the attitude toward using cargo bike-sharing systems and the intention of actually using a cargo bike-sharing system, supporting hypothesis 3.

Goal Framing and Perceived Behavioural Control

To test if there were any differences between the three goal framing scenario conditions and the PBC, the Kruskal-Wallis one-way ANOVA has been performed. The Kruskal-Wallis one-way ANOVA showed that there were no significant differences between the groups and PBC, $H(2) = .157$, $p = .925$, indicating that the different framing scenarios did not lead to a higher PBC on cargo bike-sharing systems. This is not in line with hypothesis 4.

Discussion

In this study, we investigated the effect of presenting information in different goal frames on the attitude toward using a cargo bike-sharing system and the relationship between the attitude toward using a cargo bike-sharing system and the intention of using a cargo bike. Furthermore, the effect of presenting information in different goal-frames on the PBC of using a cargo bike-sharing system was investigated. We hypothesized in line with literature that biospheric and hedonic framing would lead to a more positive attitude towards cargo bike-sharing systems than no-framing and that biospheric framing would have an even higher positive impact on the attitude than hedonic framing (Steg et al., 2012; Steg et al., 2014). Additionally, we expected that the attitude towards the cargo bike-sharing system would have a positive influence on the intention of actually using one, according to the theories mentioned earlier (Ajzen, 1991). Lastly, it was hypothesized that the different framing scenarios would lead to higher PBCs towards cargo bike-sharing systems (Lindenberg & Steg, 2007; Sigurdardottir et al., 2013).

The findings in our study reveal only evidence for Hypothesis 3. The attitude towards cargo bike-sharing systems does have a positive effect on the intention of using one. This finding is in line with prior research showing that attitude has a positive influence on the intention (Yarimoglu & Gunay, 2019). The different framing scenarios do not lead to different attitudes towards cargo bike-sharing systems (Hypothesis 1 & 2). This contradicts the research of Lindenberg and Steg (2007) and Steg et al. (2014). Additionally, the hedonic or biospheric scenario does not result in a higher PBC on cargo bike-sharing compared to no frame (hypothesis 4), which is not in line with previous research (Lindenberg & Steg, 2007; Sigurdardottir et al., 2013). A possible explanation why hypotheses 1, 2, and 3 are not supported could be that the normative or hedonic goal frame was not activated when participants read the biospheric or hedonic framed text about cargo bike-sharing systems.

Limitations and Future Directions

One limitation of our study is the way we recruited participants. We intended to approach people on the street to get a representative and random sample, but due to the corona measures, we had to reach out to individuals online. This led to a convenience sample, which may have caused the fact that over 70% of the participants were between the ages of 20-29 years old. For future research, the sample could be more representative if the participants are randomly recruited. Moreover, the power analysis we ran showed that the preferred sample size would be 159 participants, but we only had 83. Having only half the preferred sample size reduces the power and increases the margin of error, which could have affected our results. Having the preferred sample size may also lead to more generalizable results.

Additionally, the manipulation check shows that there are differences in the three different scenarios, although there are no significant differences between the scenarios and the attitude and PBC of cargo bike-sharing. A reason for this could be that the manipulation check is more of an attention check. Instead of asking a question that measures if the

participants were manipulated in the no-frame, hedonic or biospheric scenario, we asked if they recalled what the text was about. The participants did not need to have the corresponding activated goal frame to answer the manipulation check right. So, the manipulation check might have been successful, but in this study, it does not mean that the participants were manipulated. A possible solution could be to change the question of the manipulation check. We asked participants to recall what was mentioned in the text, but if we asked the participants, for example, what they thought were important keywords concerning cargo bikes, the manipulation could be measured more accurately.

Moreover, the three scenarios might be more influential on the attitude and the PBC if they were more detailed according to the frames we used. Using pictures and videos might be helpful for a successful manipulation, as it may better capture the attention of the participants during the survey. In our research, there are no differences between the scenarios and the attitude or PBC, but a reason for this could be that the scenarios did not differ enough from each other. If the biospheric goal-frame scenario emphasizes more on the environmental benefits and the hedonic had more details about the personal benefits, it may cause a bigger effect on the attitude and the PBC towards cargo bike-sharing systems. The biospheric or hedonic framed text may result in a more positive attitude than when using no frame (Lindenberg & Steg, 2007). Applying this to the PBC, when a goal frame is fully activated, it may lead to a higher PBC. Using stronger goal framing scenarios can be considered in future research.

For future research, it might be insightful to study the relationship between the PBC and the intention of using cargo bike-sharing systems. In the current study, only the effect of the goal framing scenarios on the PBC of an individual was studied. It could be implemented as a moderator between the attitude and the intention of using cargo bike-sharing systems, to explore if the PBC affects the relationship between the two variables. The PBC will be a fixed

variable, which might help with the understanding of who is more likely to make use of a cargo bike-sharing system because the PBC positively influences the intention of performing pro-environmental behaviour (Steg & Nordlund, 2019).

Implementing the third goal frame of the Goal Framing Theory (Lindenberg & Steg, 2007), namely the gain goal frame, could also be considered in future research. We did not implement this goal frame in our model, but it may also have an impact on the attitude towards cargo bike-sharing of an individual. When using all three goal frames, it may help explain more broadly how the Goal Framing Theory is involved in the attitude towards cargo bike-sharing systems and how this theory may be better able to help increase the number of cargo bike-sharing users.

Theoretical and Practical Implications

The results of our study are not fully in line with the theories and studies. Our findings concerning the framing scenarios and the attitude towards cargo bike-sharing systems are inconsistent with the literature (Lindenberg & Steg, 2007; Steg et al., 2012; Steg et al., 2014). Contrary to the literature, the biospheric goal frame does not seem to have a more positive impact on the attitude towards cargo bike-sharing systems than a hedonic goal frame or no frame at all. It would be expected that this goal frame would have a more positive effect on attitude than the other two scenarios, as it is most related to pro-environmental behaviour (Steg et al., 2014). There was no difference at all between the scenarios, even though a goal frame, hedonic or biospheric, was expected to have a more positive effect on the attitude than no frame. This is because highlighting the benefits, personal or environmental, of cargo bike-sharing would be expected to activate the hedonic or biospheric goal frame, leading to a positive attitude towards cargo bike-sharing (Steg et al., 2012; Steg et al., 2014). The different goal frame scenarios also did not result in different PBCs regarding cargo bike-sharing, which is not in line with the theories concerning this topic (Lindenberg & Steg, 2007; Sigurdardottir

et al., 2013). When highlighting the ease and appropriateness of using cargo bike-sharing, it was expected that the PBC would become higher towards cargo bike-sharing systems. A reason that the different goal frame scenarios did not result in a more positive attitude or a higher PBC concerning cargo bike sharing may be that the scenarios did not differ enough from each other to activate the different goal frames. The findings concerning attitude towards cargo bike-sharing systems and the intention of using cargo bikes are, however, consistent with the literature (Ajzen, 1991; Yarimoglu & Gunay, 2019). As they mentioned in their studies, a more positive attitude towards pro-environmental behaviour, in this case using cargo bikes, leads to a higher intention towards performing pro-environmental behaviour.

The results we found may be of importance to the municipality of Groningen, as they are planning on implementing cargo bike-sharing systems in the city centre of Groningen. With these results, they may have gained more insight into the perception of residents of Groningen concerning cargo bike-sharing systems. Moreover, the findings can be of use when the municipality of Groningen intends to promote these sharing systems, because the way information is presented may change the attitude and intention of using cargo bike-sharing systems.

Conclusions

In conclusion, these results showed that there are no differences in the attitude towards cargo bike-sharing systems due to the different goal framing scenarios. The PBC also did not heighten as a result of the different goal framing scenarios. The attitude concerning cargo bike-sharing systems does, however, has a positive effect on the intention of actually using one. There are still a lot of possibilities for future research to gain more insight into the attitude towards cargo bike-sharing systems and how this can be influenced and lead to an increase in usage of such systems. Besides this, the PBC and how this might affect the

intention of using cargo bike-sharing systems is a topic where further research can be

beneficial to gain more insight on who is willing to use cargo bike-sharing.

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Appendix A

Figure 1

Handout for Data Collection