Choo Choo Choosing Sustainable Transport

Unraveling the factors of human behavior that influence Sony Mobile Communication employees and Emporia shoppers transport mode decisions

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Master Thesis Series in Environmental Studies and Sustainability Science,
No 2014:030

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science (30hp/credits)

LUCSUS
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Submitted May 15, 2014

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Abstract

Transportation is a necessary part of our daily lives and the environment would greatly benefit if the majority of people used sustainable transport. The current mechanisms set in place to change people's behaviors, however, have lacked an in depth psychological understanding of how people make transport decisions. The aim of this thesis is to explore the world of psychology and behavior and to attempt to determine the underlying factors that motivate people's transport decisions. Simultaneously, currently used mechanisms that change transport behavior and other newly formulated ones will be hypothetically tested as a source of possible methods to guide people towards making sustainable transport decisions. The findings of this thesis determined that the psychological factors that guide people's transport decisions are different depending on their circumstances. These finding, along with other findings, can be used to help improve the future designs of urban planning and public transport.

Keywords: Behavior, Transport, Willingness to Pay, Norms, Psychology, Parking, Compensation, and Decision-making

Word Count: 13,984

Acknowledgements

I would like to thank my supervisor, Karin Steen, for all her guidance through my thesis writing process. I would also like to thank my peer group partner, Ole Oberste Berghaus, for all his support and help during our many group thesis meetings.

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1 Introduction

Transportation has become a necessary component of our daily lives. We depend on transportation to gain access to the various locations that we go to. Sometimes, it is mandatory that we travel to a certain location. Other times, we travel to places during our own free time in order to take care of tasks. The decisions we make choosing how we travel is important in understanding if we want people use sustainable transport which is less impactful on the environment. The primary aim of this thesis will attempt to unravel the underlying motivational factors that steer individual's transport choices and explore various techniques that can be implemented to direct individual's to instead choose sustainable transport. There must be a psychological understanding of these motivational factors because of their influence on human behavior to facilitate this change from the bottom up. A bottom up approach could be accomplished through a combination of strengthening factors that promote sustainable transport, weakening factors that promote unsustainable transport, and combining top-down mechanisms (willingness to pay and willingness to accept and other outer pressures) as an effective compliment. This study will focus on two groups and locations that have different circumstances and reasons for taking transport to those locations. One group will consist of employees in Lund, Sweden who work for the company Sony Mobile Communications. The Sony group consists of employees that commute to the Sony location site in order to work, earn a living, support themselves and their family, and to innovate new products. In addition, their commuting usually is limited to weekdays, right before and after business hours. The other group will consist of consumers that transports to the Emporia mall located in Malmö, Sweden; which is open from 10am-8pm. This group of consumers has the option to travel to the mall whenever they please and usually this trip consists of shopping, socializing with friends, and browsing around for new merchandise. The exploration of this topic will be guided by the following:

1.1 Research Questions

1. What are the underlying dynamics that influence people's decisions to change their transport mode behavior?
2. How will car drivers react if outside pressures are applied (parking fees, compensation, free bicycles, and/or a free alcoholic beverage)?
3. With the psychological and behavioral knowledge gained from the research of this thesis, what type of actions can be implemented by policy makers and businesses in order to effectively promote sustainable transport mode use?

2 Theory

2.1 Welfare Economic Theory

Transportation choice is a behavior that can be affected through outside economic pressures from the self and a common basis to accomplish such measures is through cost-benefit analysis (CBA) which considers an aggregation of individual preferences and translates that value into a monetary figure. Cost-benefit analysis is underpinned by welfare economic theory which utilizes benefits and costs in microeconomic techniques (de Donnea, 1972). Benefits are stated as increases in human well-being, increased utility, in a society and costs are considered reductions in well-being. The definition of a "society" can be limited to various populations of interest including groups, cities, nations, etc (OECD executive summary, 2006). For example, in the study of the Sony case for this thesis, the aggregation of all Sony employees that commute to the Lund location on a regular basis can be defined as a group of interest, or "society". The normative assumptions laying behind the CBA groundwork are as follows (O'neill & Spash, 2000):

1. Humans can be viewed as separate individuals that want to fulfill their preferences.
2. These preferences are stable, context independent, and ethically unchallengeable.
3. The role of social choice institution is to determine these preferences and aggregate them to strive for an ideal social result.
4. The ideal public decision is one that maximizes the preference satisfaction of all the individuals which in summary means that the benefits outweigh the costs.

In CBA, individual preferences and decision making are chosen by the amount of value that an individual places on something and this can include objects, ideas, people, and so forth. It is assumed that the value placed on something is reflexive, complete, and continuous which usually follows suit of behavior that is consistent. In addition, it is assumed that humans are instrumentally and economically rational and that they act in a favored preference in order to attain the highest level of expected satisfaction and therefor is more beneficial (Pearce, Atiknson & Mourato, 2006). For example, if somebody prefers driving their car to the mall over taking public transport then this would mean that the person places higher value towards driving their car and lower value towards taking public transport; driving provides higher well-being. Individual preferences are of course subjective. However, CBA aggregates these preferences and strives for an ideal result that is satisfactory for the majority of participants in the group of focus (O'neill & Spash, 2000).

2.2 Consumer Theory

It is possible to affect decision making behavior using economics grounded in consumer theory which assumes that humans are rational and subject to budget constraints. Consumer theory is similar to CBA except it goes on further to include the effect of budget constraints on the individual. Consumer theory states that consumers rank an order of preferences and make their choices to maximize their self-individual well-being. In addition, it is assumed that when people make choices of self-interest they are exposed and limited by the constraints of income, capital, and price changes. Consumer theory postulates that outward economic pressures can change consumer behavior by altering prices of goods and services (Barnett, Fisher, & Serletis, 1992; Influencing consumer behavior, n.d.). In the case of this thesis, placing fees to pay for the services of allowing a car to be parked in a certain space could possibly change the consumer's preferences, depending on their economic circumstances, and their choices may then be in favor of another mode of transport. The consumer's choice will be rationalized to maximize their self-utility; switching transport may lower their utility compared to driving their car but the overall utility may be higher if a pricing fee is placed. Oppositely, consumer preference ranking can also be affected by relieving constraints and instead offering a monetary incentive to not park in a particular parking spot. This would have added benefits of increasing one's income resulting in a possible maximization of an individual's well-being if the monetary incentive increases utility more than the amount of utility lost in switching transport mode. Economic pressure and relief can be feasible by applying market mechanisms often referred to as willingness to pay (WTP) for a benefit to achieve a certain level of satisfaction and willingness to accept (WTA) for a monetary amount in replacement of a product, item, or service. CBA can be applied to the transport sector by implementing WTP and WTA actions before commuting takes place or during the personalized vehicle parking phase. A WTP scenario could be drawn when an individual is charged a fee to park their vehicle in a particular spot. This is most commonly practiced in parking garages and metered street parking; sometimes coordinated with time restrictions. Reversely, a WTA scenario would be depicted when an individual is paid a certain amount to *not* park in a particular spot. The application of WTP and WTA has been researched in numerous transportation studies and determined to be an effective method to change transport mode decision making when there was no previous motivation to do so; usually depending on the fee prices (Enoch, 2002; Hess, 2001; Li, Zhang, & Papacostas, 2008; Shoup, 1997; Van der Waerden, Borgers, & Timmermans, 2006).

2.3 Presenting Examples

This section will discuss economic and non-economic mechanism cases that have shown significant success in changing transportation behavior.

2.3.1 Parking Cash-Out

Parking cash outs are payment schemes that have been used by numerous organizations and companies, including hospitals, Vodafone, and Pfizer, in order to deter their employees from using their employee parking spots and encouraging other forms of commuting such as carpooling, walking, biking, and the train. These schemes are grounded in CBA and are carried out through a willingness to accept of monetary amounts, WTA. A parking cash out is when money is offered to drivers as a substitution to not park in the parking lot (Enoch, 2002; Shoup, 1997). One of the primary reasons that organizations and companies have used parking cash out is due to lack of available parking spots for employees (Enoch, 2002). However, the same mechanism can still be applied if the goal is to create sustainable behavioral choices in favor of using other modes of transport besides private vehicles.

The following cases came from the article *UK parking cash out experience, and lessons from California* by Marcus Enoch (2002). These cases will showcase various parking cash out schemes that showcase various timeline payment ranging from one-time, yearly, monthly, and daily.

At the telecommunications company Vodafone in Newbury, England, employees are given the option to give up their parking spots for the whole month and instead receive 85 pounds extra to their paycheck. If the participant regrets giving up their parking spot they can *apply* for another parking spot the next month. However, this has had unfavorable circumstances because the applicant must re-apply and stand in line for the next parking spot when there are already many applicants waiting before them due to the lack of available parking spots. The response rate has been 33% with about 1500/4500 employees that have participated in the parking cash out program (Enoch, 2002).

At the telecommunications company Orange in Bristol, England, employees are given the option to give up their parking spot for a four year parking cash out contract that pays out a big first year upfront payment and then smaller payments each subsequent year. The payments are as follows: 1,200 pounds the first year, 900 pounds the second year, 600 pounds the third year, and 300 pounds the fourth year. This scheme was designed because the amount of parking is extremely limited, 105 spaces for a total of 700 employees (Enoch, 2002).

At the Derriford Gerneral Hospital in Plymouth, England, certain employees can qualify to give up their parking spot for a one-time parking cash out of 250 pounds and an extra amount to cover taxes. If the employee decides to participate, they will be permanently deleted from the parking monitoring system and can no longer re-apply for parking. The response rate to this program has been only about 0,20% with only 7 out of 3500 people participating. It has been discussed that the cash out amount is too low and employees value their parking spots at a higher amount (Enoch, 2002).

A daily point system is used at Pfizer in Sandwich, England and Reigate, England, and there has been a response rate of about 33% of the employees who travel by other modes of transport other than car. Employees begin with a certain amount of parking points. Every time the employee parks in the parking lot, their point allowance is reduced. Any unused points at the end of the month will be converted to a currency amount and will be credited to their monthly paycheck.

Enoch (2002) draws the following conclusions from these parking cash out cases. It seems that the enrollment rate of cash outs is highly effected by the time frame of payment (one-time, yearly, monthly, and daily), flexibility, and value amount offered. In terms of contract length, a longer time-frame contract to give up parking may be a barrier that prevents an employee from participating in parking cash out because they may not want to commit to an agreement that long in the event that they decide that they would rather drive to work and park their car. Alongside, the parking cash out amount seems to be an important factor as the employee must weigh their option and determine if the value offered for the parking spot is worth the costs and experiences of switching to another form of transport. It would be presumed that the cash out value should be, at minimum, be able to cover the costs of switching to other forms of available transport. In addition, the decision to change transport is also influenced on the availability of transport mode options that are available to the employees. If the proper infrastructure for transport such as walking, biking, and trains, is not available, then a parking cash out option will most likely not succeed (Enoch, 2002).

2.3.2 Company Bike Offer

Outside of economic payment schemes, there is an alternative scheme that has been effective in changing transport behavior for daily commuters. In Aalborg, Denmark, a company bicycle scheme was tested and yielded positive results in employee transport mode switching. 9 local companies were provided with 35 bicycles for their employees to freely use to commute from home to work, and vice-versa, under the stipulation that the bicycles traveled more than 300 km within the first 6 months. Otherwise, there would be a charge fee for using the bicycle. After the first 6 months, the bicycles

traveled an approximate total of 21,700 km. This replaced 9% taxi use, 37% bus use, 6% company car use, and 33% private car use. Another important aspect to take from this example is that public transport was reduced which could have further positive impacts towards fossil fuel and pollution reduction, minimizing vehicular traffic, and noise reduction (Marshall & Banister, 2000).

2.4 Swedes, Alcohol, and Driving

During numerous thesis meetings with my supervisor Karin Steen and group partner Ole Oberste Berghaus we pondered different types of mechanisms outside of economics that could be used to change transport behavior while simultaneously making people feel good. We came up with the idea that an alcoholic beverage offer may be something that people would enjoy and at the same time may prevent them from driving their cars. Sweden has some of the strictest law enforcement driving rules in Europe with a maximum blood alcohol driving limit set at 0.2g/L. In addition, Sweden has the highest number of drinking and driving checkpoints in Europe which are placed in locations with anticipated high amount of drinking and driving (Podda, 2012). Surveys have shown that Swedes are very informed to the risks, dangers, and consequences of drinking and driving and that it is socially unacceptable (*European drivers and road risks*, 2004). When asked how many drinks one can have before being too impaired to drive 45% of Swedes responded that zero is the safest; the highest number of responses in all of the European survey participants (*EU citizens' attitudes towards alcohol*, 2010; Podda, 2012).

As a stimulant that adds pleasure to people's moods, alcohol has been shown to accomplish this when given at low levels (Kano, Gyoba, Kamachi, Mochizuki, Hongo, & Yanai, 2003). This concept of adding positivity to people's moods while trying to shift people away from driving behavior will be an experiment included in this thesis.

3 Behavioral Models

This chapter will detail my own formulated integrated behavior model which draws from a model by Icek Ajzen called planned behavior (1991). I primarily use planned behavior as a base and make adjustments according to my perspective while simultaneously integrating aspects of WTP, cash outs, and other mechanisms that will be later explained. The structure of this chapter will begin with a description of planned behavior followed by my integrated behavior model.

3.1 Planned Behavior

Economics and bike offer schemes are not enough on their own to make individual sustainable behavior change. A different perspective must also be taken into consideration that looks at the inner self's motivations to participate and complete an action. Unlike CBA theory, which applies outward economic

monetary pressures on the individual, Ajzen's (1991) planned behavior theory (PBT) takes a psychological perspective from one's self and can be equally as important when considering strategy development that strives for sustainability. Ajzen's theory of planned behavior provides a basis of significant factors that push and pull a subject's intent towards achieving a goal which include beliefs, attitudes, norms, perceptions, and control (see figure 1). Essentially, Ajzen expresses that intention is the most significant component in regards to taking action towards performing a certain behavior. Intention comes in a range of strengths and is a pre-determining factor towards how likely one is to perform a desired behavior. The stronger one intends to act on a certain behavior, the more likely they will be in performing that action. If a person intends to drive a pickup truck to work without any barriers interfering with that behavior, then that person will most likely choose to drive a pickup truck over taking a public bus if these two options are presented. As previously stated, Ajzen's PBT articulates that intention is also impacted by attitudes, norms, control, beliefs and perceptions. This can be important for creating sustainable transport because an understanding of factors that affect one's intent to change behavior must be identified. I will now describe PBT in detail as I draw on it and then present my integrated behavior model.

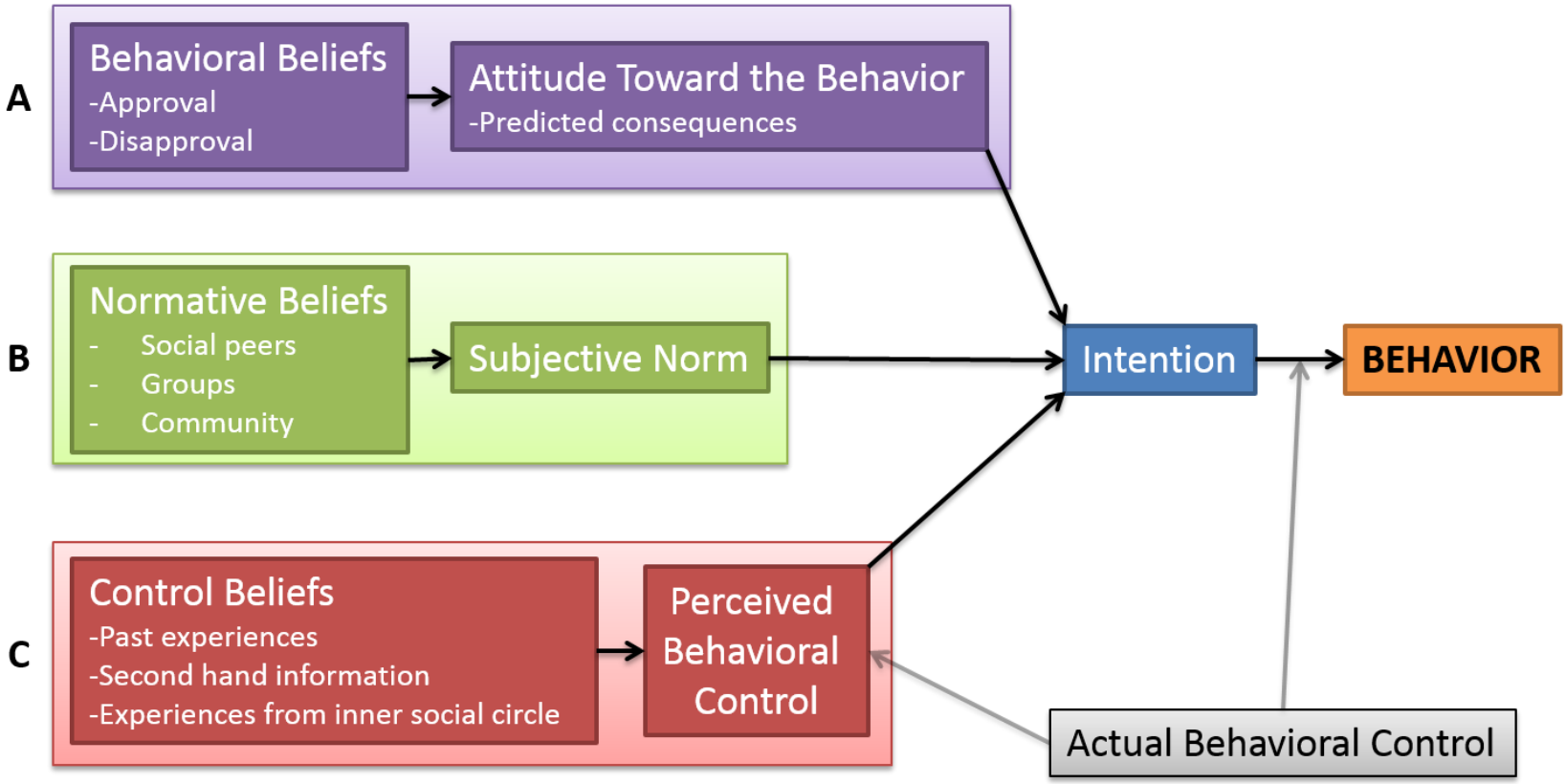

Figure 1. Planned Behavior Theory outlines Icek Ajzen's perspective on the process of behavior (Ajzen, 1991)

Planned Behavior Factors (Labeled A, B, and C on left of Figure 1)

The three different types of beliefs in planned behavior (behavioral, normative, and control) have casual relationships with attitude, subjective norm, and perceived control. The following section will further explain those relationships in the labeled blocks A, B, and C.

Block A

The subject's beliefs towards a behavior can be viewed by how they approve or disapprove the behavioral action of focus. Stronger agreement with a behavioral action has positive influence in their attitudes towards that behavior; and vice-versa. The alignment of the person's beliefs in respect to the behavioral action directly shapes their attitudes towards that behavior. Alongside, the consequences of performing the behavior are also weighed as a determinant of the subject's attitude. If the consequences of the behavior are perceived as positive and outweigh the negatives then a perceived attitude towards the behavior will be in favor and consequently increase the intention to perform that behavior (Ajzen, 1991). For example, if somebody is not concerned with the environmental impact of driving their car then they will have a higher intent towards the behavior of driving a person vehicle.

Block B

Outside of the subject's behavioral beliefs, they are also affected by their social peers, groups, and community's normative beliefs. The normative beliefs of a behavioral action are how the subject's surrounding groups perceive behavioral expectations. This applies peer pressure on the subject and adjusts their norms towards the behavioral change as they possibly comply with normative beliefs of other groups they are part of. Therefore, the subjective norm plays a role in strengthening or weakening the intention of the subject to perform a behavioral action (Ajzen, 1991). For example, if an employee who drives an automobile is surrounded by colleagues that believe biking to work is the best mode of transport due to various benefits and it is expected that all employees live up to this standard then the driving employee may feel social pressure to switch their mode of transport in order to meet the expectations of his/her co-workers.

Block C

Perceived behavioral control is a determinant of one's perceptions of their ability to perform the behavior. Their perceptions of control are shaped by factors which include past experiences with the behavior, second-hand information about the behavior, experiences from one's inner circle, and other factors that shape the perception of difficulty towards performing the behavior. The perceived behavioral control is also affected by the presence or absence of resources and opportunities to achieve that behavior. The more perceived resources and opportunities available, combined with minimal perceived obstructions, will positively correlate in a perception of control towards that behavior (Ajzen, 1991). For example, consider somebody who intends on becoming more sustainable by taking public transport instead of using their personal vehicle. Assume the following: the person lives a 30 min walk from the closest public transport stop, public transport costs more than driving, public transport has pick-up and drop-offs in 2 hour intervals, and public transport only runs 3 days a week. This person's perceptions of control to act on this behavior might be very negative due to opportunity limitations and accordingly weaken their intention to perform a more sustainable transport choice.

3.2 Normative Conduct Theory

Aside from Ajzen's (1991) planned theory, normative conduct theory can give further insight into how humans perceive the world and human behavior in relation to normative beliefs and subject norms. Similar to planned theory, normative conduct theory suggests that the perceptions of how we see the world can influence how we behave (Cialdini, Reno, & Kallgren, 1990). Normative conduct theory consists of injunctive norms and descriptive norms (Figure 2).

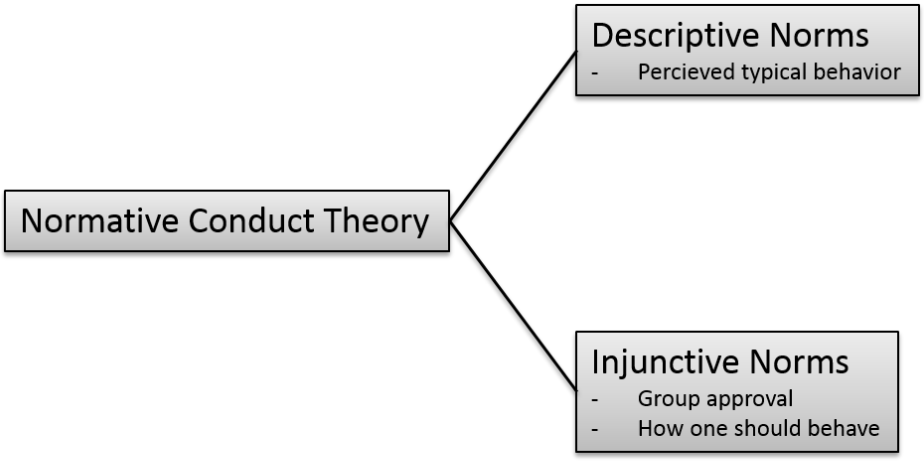

Figure 2. This is Normative Conduct Theory and it suggests that behavior is affected by norms (Cialdini, Reno, & Kallgren, 1990)

Injunctive norms are perceived behaviors that are accepted or unaccepted by groups, communities, and societies; similar to Azjen's normative belief (1991). In addition, injunctive norms consist of ideas of how we ought to behave. Descriptive norms are the perceived behaviors of what is often performed and has the implications that humans behave in similar fashion to what is often done because everybody is doing it. For example, if it is perceived that everybody is taking a work provided tram to the work site, it can be expected that one will most likely also take the tram because it has become the norm to perform that same behavior. Both of these norms motivate human behavior as humans want their behaviors to be socially accepted and they want to follow suit and perform behaviors that everybody else is doing (Cialdini et al., 1990).

3.3 My Integrated Behavior Model

While welfare economic, CBA, consumer theory, planned behavior, and normative conduct theory individually have strong valid points that are supported by research, it is not enough to stand by itself in formulating the most effective plan towards sustainable transport mode change. I have integrated what I consider the most important components of these theories and created my own interpretation of how I view the processes involved in behavior (see figure 3). This model is later on tested/applied in my case studies of Sony and Emporia.

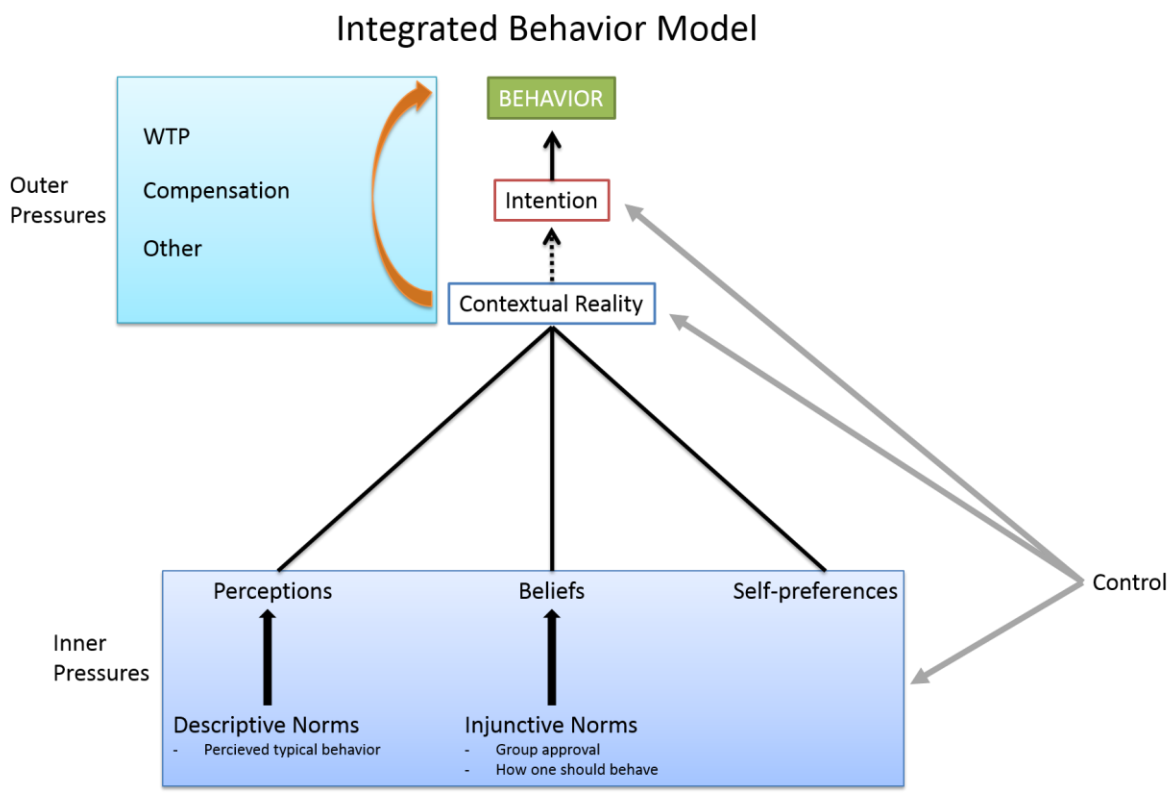

Figure 3. My own Integrated Behavior Model that combines inner and outer pressures towards influencing behavior (Wee, 2014)

I view this process as two fold by taking into consideration the inner self of the subject and outside pressures that the self is subjected to which also affect behavior. As discussed above in PBT, Ajzen distinguishes intention to be the most influential element which dictates one's goal to perform a behavioral action. However, after a literature review of case studies applying WTP and cash-outs, it is apparent that economic market mechanisms can create pressures outside, **outside pressure**, the self which can also lead to behavioral change, regardless of whether the subject even intended to act on a certain behavior (Enoch, 2002; Hess, 2001; Li et el., 2008; Shoup, 1997; Van der Waerden et el., 2006). In my perspective, Ajzen (1991) has missed a stage that takes place before intention that I call **contextual reality** which consists of the situational circumstances that can highly influence a subject's behavior. For example, a person may have the situational circumstance that they must pick up their children from school after work; therefore, they choose to use their vehicle. I consider **contextual reality** as the intermediate process, external of outside pressures, which is interlinked with inner pressures. In my perspective, I have made a semi-separation between **contextual reality** and **intention** because these two factors may not be in alignment between one another. It is completely plausible that one might have the **intention** to act on a certain behavior but their **contextual reality** stops them from

proceeding forward. For example, one may have the **intention** to start biking to work for the following reasons: get exercise, save money, lower air pollution, and lower gas consumption. Although, they may never truly follow through on that **intention** and take action to bike to work because of their **contextual reality** which is that the work location is too far away. Oppositely, **contextual reality** can also be in alignment with **intention** which directly leads to stronger action of the desired behavior.

In PBT (fig 2), the following factors are viewed as primarily increasing or lowering intention: attitudes, norms, control, beliefs, and perception. In my integrated behavioral model (fig 3) I have simplified Ajzen's (1991) fundamentals to **perceptions**, **beliefs**, and **control**. Additionally, I have added an extra fundamental, **self-preferences**, and integrated normative conduct theory as the underlying influences that shape our perceptions and beliefs. As previously explained, descriptive norms are the behavioral observations that the subject makes in their surrounding which dictates one's **perceptions**. The behavioral observation does not necessarily mean that the perception holds true. For example, if somebody drives their automobile to the shopping mall and takes a route where other forms of transport are not visible at all, the person descriptive norm is that everybody drives to the mall to shop. However, the reality could be that the majority of shoppers take public transportation to the mall which was however never observed by the driver. The driver's descriptive norm that driving to the mall is common behavior among everybody creates the **perception** that this is how everybody behaves and further can reinforce driving behavior; even if the majority of shoppers are actually commuting by public transport[1]. I have re-categorized **beliefs** as the psychological state in which one assumes that a particular idea is true and underpinned it with injunctive norms; behaviors that are approved by others and concepts of how we *should* behave. Our **beliefs** can be shaped by injunctive norms as humans care about what their peers approve and disapprove in order to be accepted into the group. Alongside, concepts of what our behavior *should* be correspondingly steer a person's beliefs. For example, an injunctive norm could be if an employee is surrounded by a majority of fellow coworkers that strongly support biking to work because it is agreed that humans should take action to help lower gas emissions to mitigate climate change. This circumstance can steer the subject's belief that biking to work is what humans should be doing which motivates the individual to possibly perform that action. I have chosen descriptive and injunctive norms as a critical influence of **perceptions** and **beliefs**, respectively, due to several research cases that have been published finding that selective activation of one norm over the

[1] Translated from the case of the role of descriptive and injunctive norms in college fraternity and sorority drinking behavior (Larimer, Turner, Mallett, & Geisner, 2004)

other can have significant results in changing behavior (Groot, Abrahamse & Jones, 2013; Van Der Linden, 2013).

I have added **self-preferences** as a factor to my integrated behavior model (see fig 3) because I argue that it also has significant implications on a subject's **contextual reality**, and vice-versa. PBT does refer to preferences but he applies them to what the preferences of social groups (PBT normative beliefs) are and the capacity of the subject to comply with those social group preferences (Conner & Armitage, 1998). Unlike Ajzen's (1991) perspective, I view preferences in terms of those which originate from the self. A person's inner **self-preferences** fuel further reasons why one would act on a certain behavior and their **self-preferences** will be in competition with social group preferences. An example of **self-preferences** would be when a person prefers to drive their car to work because they prefer the freedom to go when and where they want, air-conditioning, personal radio, and so forth. My integrated behavior model (see fig 3) provides that the factors (**perceptions**, **beliefs**, **self-preferences**, and **control**) can give insight to the inner psychological workings in behavior. It must be assumed that all these factors may not be in alignment with one another and may in reality conflict with one another because each factor will have a certain gauge of strength and will provide dominance over other factors. For example, a subject's self-preference to drive to the shopping center may be strong but their desire to be accepted by their social groups who take public transport may be even stronger.

I have additionally added an extra segment that is completely excluded from PBT which I call outside pressures, as mentioned in the previous paragraph. In my perspective, we begin the first stage of decision making with our inner pressures (see fig 3) of **perceptions**, **beliefs**, and **self-preferences** and this is all interconnected with our **contextual reality**. The next stage of decision making can possibly be influenced by outside pressures that would make the subject deviate from their initial desired, or undesired, choices and further steer them to take different action; hence changing their behavior in the final stage. The outside pressures that I have included in my integrated behavior model are economic based pressures (**WTP** and **Cash-Outs**), **compensation schemes** (public transport tickets), **bicycle schemes**, and an **alcoholic beverage offer**. However, these are only a few outer pressures to name and these selected ones will be the focus of this thesis. As formerly discussed, research has presented that a couple of these outside pressures have had levels of success in affecting peoples transport decision; except for the free public transportation offer and alcoholic beverage offer which are an exploration into an unmapped realm. To take us through the whole process and make everything clearer we will look at a proposed example that could realistically occur. Imagine a woman named Kim must go to the

shopping mall to buy several items and then go directly to another city to visit a friend. Initially, Kim thought about driving her vehicle to the mall because she has a **self-preference** to be able to carry more stuff during transport even though she has the **belief** that the environment is important. Furthermore, her **contextual reality** of visiting her friend in another city steers her decision to drive despite her **perceptions** that everybody else is taking the bus to the mall. Fortunately for her, she has a high level of **control** to take various modes of transport to all of these locations, if she wanted to, due to a well-designed transport infrastructure. In the first inner pressure stage, Kim's **contextual reality** and **self-preferences** dominate over the inner pressures of **perceptions** and **beliefs**. This example also highlights the possible separation between Kim's **intention** and **contextual reality** because she cares about the environment but under the current circumstances she would rather to drive. Before Kim makes the choice to use her vehicle, she checks the internet and unexpectedly discovers that there is a fee to park, **WTP,** in the parking garage. To make things even more interesting, the mall is offering a **free public transport ticket** to anybody who purchases an item. Kim now contemplates for several minutes what she should do because she feels the economic burden of paying a **parking fee** while also considering a **free public transport ticket**. In the end, she decides that under her financial situation the best option is take public transport to the mall and then to her friend's house in the other city. This example goes through the process of my integrated behavior model and showcases how it is not only inner pressures that steer our behavior but also how outer pressures can come into play.

4 Methods

4.1 Case Methodology and Triangulation

To gain a deeper understanding of the motivational factors that influence people's behavioral choices to drive a car, take the train or bus, ride a bike, walk, carpool, and so-forth, I must use versatile methods that are able to capture complex human psychological thoughts. Case methodology fits exceptionally well to the nature of this thesis due to the psychological and behavioral phenomenon which will be probed. Case methodology is when a "how" or "why" question inquires contemporary events which the researcher has little control (Yin, 2009). This method will enable openness for the participant to reveal perspectives that were possibly not expected and uncover the inter-linkages in discovering the most significant "why's" that motivates transport user's choices. Triangulation will be utilized combining qualitative and quantitative methods in order to unravel the underlying motivational factors that affect people's behavior when choosing transportation mode (Jick, 1979). A basic assumption of triangulation is that a weakness in one method will be compensated in the strength of another method. The complimentary nature of combining qualitative and quantitative methods will help enrich data and paint

a better portrait of the psychological workings of the human mind during decision making. The use of triangulation will enable qualitative factors to be scaled which will yield quantitative results. This will be important for the work of this thesis as adding weighted value to qualitative factors (beliefs, perceptions, norms, preferences, control, etc) is necessary in order to understand what factors more strongly motivates people in their transportation choices. In addition, the use of more than one method in triangulation, qualitative and quantitative methods, may reveal convergence which yields consistent results that support one another and provides comprehension. However, triangulation may also uncover divergences in responses which would be disagreements in responses and data misalignment (Jick, 1979). For example, a participant may provide in an open-ended qualitative response that they believe that preserving the environment is of the utmost importance. However, they may respond that it is not important to a scaled version of that same message in a question format. For these reasons, Ajzen's questionnaire construction was utilized as the base design structure in data collection as it gathers a mixture of qualitative and quantitative information (Ajzen, 2011).

4.2 Qualitative Research

Qualitative research aims to find answers to questions by collecting evidence through techniques such as interviews, focus groups, and participant observations. Each technique is unique in obtaining specific information through unrestricting interactions between participants and researcher and sometimes even solely through observations of the subject. I have chosen qualitative research because it is better able to capture behavior, perspectives, opinions, and positions that quantitative research would have difficulties fully grasping (Patton, 2005). It can be elegantly summed up as

"qualitative approaches lend themselves better to the production of serendipitous findings and are in many cases broader and more holistic in perspective than quantitative tools" (Das, 1983).

I will use qualitative methods to open a world of unpredictable responses that will later be categorized to uncover hidden meanings into the given phenomenon of transport behavior. This will allow for interpretations of information that can uncover the inter-linkages and complexities that are inferred from quantitative data.

Interviews are the most common strategy for collecting qualitative data which entail an interaction or interactions between participant and researcher in a possible range of loosely guided conversations to an interview with a set of highly controlled parameters. These interviews are often classified as unstructured, semi-structured, and in-depth interviews which approach gathering data from different angles. It is often dependent on what type of information is desired when selecting the type of

interview. Regular use of open-ended questions is employed due to the capacity to dig deeper into an individual's personal history, perspective, and experiences. Unstructured interviews often consist of loose dialogs in which the researcher takes notes while observing and questioning. The researcher forms questions during the processes of both discovery and participant observations. Semi-structured interviews are another type of interview which collects data exclusively from the interview; outside of observational data. Semi-structured interviews consist of pre-determined open-ended questions with more questions forming during the interaction between participant and researcher. As stated previously, the difference between unstructured and semi-structured interviews is that unstructured interview data includes notes and observational data (DiCicco-Bloom & Crabtree, 2006).

A survey will also be designed which uses a 7 point Likert scale to answer various statements and questions in my integrated behavior model factors including: **beliefs, injunctive** and **descriptive norms, level of control, intention to change behavior, WTP, WTA, compensation, bike offer,** and an **alcohol drink offer**. The use of the Likert scale will enable the participant's answers to be weighted into a quantitative measurement (Balram & Dragicevic, 2005). Additionally, the survey must be expanded to determine the open answers to the factor of **self-preferences** in my integrated behavior model. Therefore, I will include open questions that are qualitative in nature [2]. Even though qualitative techniques are primarily face to face interactions that are directed and guided by the researcher, they can also be formatted as open-ended questions. This will allow the participant to freely express **self-preferences**, feelings, perspectives, and thoughts that would not have been captured using close-ended questions. There will be 50 survey/interviews that are conducted: 25 at the Sony building and 25 at the Emporia mall.

5 Discussion - Applying my Integrated Behavior Model on Emporia and Sony Cases

The structure of this chapter will be based on my integrated behavior model (see fig 3). The first section will focus on **self-preferences** of inner pressures. To reiterate, a person's inner **self-preferences** fuel additional reasons why one would act on a certain behavior. All participants were asked the open question of why they prefer to take the mode of transportation that they do. The most frequent openly expressed self-preferences will be discussed followed by a short brief discussion of several selected least frequently expressed self-preferences. The other inner pressures, **perception** and **beliefs**, will then be

[2] The survey can be seen in Appendix A and B

discussed for both cases. Lastly, the **outer pressures** will be discussed in the respective order: **WTP, compensation, free bicycles,** and **free alcoholic beverage**.

5.1 Self-Preferences

My integrated behavior model (see fig 3) outlines **self-preferences** as one of the factors that is linked to **contextual reality**. After conducting 50 survey/interviews[3], 25 Sony employees and 25 Emporia shoppers, many **self-preferences** were openly responded by both groups when asked the open question of why they prefer to use the mode of transportation that they use to come to that specific location. Some of the responded **self-preferences** include *time, freedom, health,* and *comfort*. Some of these commonalities were shared by both groups while others were not shared by one another.

5.1.1 Sony Employee's Prominent Self-Preference

The most frequent open-ended **self-preference** that Sony employee's factored when choosing how they select their transport mode was discovered to be *time*. More than 75% of the employees consider the ability to quickly get to work and back home, or wherever they go after work, as a priority in their personal lives. *Time* may be a significant **self-preference** in transport decisions as Sony employees have a certain schedule that pertains to their work duties which includes a certain starting time, lunch time, and ending time. Several participants openly said during interviews that family responsibilities played an important role in their lives and using transport that was the fastest to commute was crucial. One participant stated that he must drop his kids off on the way to work and another participant explained that he must

"sometimes catch my children from school on the way home".

For another participant, *time* was of utter importance due to his duties in the company. His position as a construction manager required that he travels to different sites throughout Skåne and it is necessary that he gets to those locations as fast as possible. For that reason, this participant drives to Sony. The daily work schedules that workers have would appear to guide their **self-preference** for *time* as an answer.

5.1.2 Emporia Shopper's Prominent Self-Preferences

Unlike the Sony group, *time* was not a one-sided recurring **self-preference** that was responded by Emporia shoppers. Instead of having one single pronounced **self-preference** that was openly responded by Emporia shoppers, there was a cluster of **self-preferences** responded that were almost equally

[3] The survey can be seen in Appendix A and B

distributed in number of times they were mentioned which were as follows: *enjoyment*, *carry more stuff*, and *time*. *Enjoyment* was the most frequent response by 7/25 shoppers and the breakdown of their transport modes were as follows 2, 1, 2, 1 and 1: car, motorcycle, bus, bicycle and walking, respectively. In comparison to Sony employees, there is the possibility that shoppers have less urgency and restrictions to meet demanding time timetables allowing an opportunity for more personal time and the preference to choose transport modes based on what they consider to be the more enjoyable experience on their way to Emporia. Of the 7 that stated *enjoyment*, only one of them also openly stated *time*. Alongside, only one of them openly stated *carrying more stuff*. This would suggest that the majority of this sub-group of participants did not choose their mode of transport because it was faster or easier to *carry more stuff*. Experiences are subjective and the experience of taking a train may not be *enjoyable* for one person as it is for another person, and vice versa. For example, the participant who took the bus voiced that the bus is

"soothing…nice to sit on the bus and have your own thoughts while relaxing".

Another example would be the other bus user who explained that he has driven his whole life but finds the bus to be a more *enjoyable* experience which is why he takes it to Emporia. The motorcycle user expressed that taking his motorcycle was a lot fun and that was the sole preference he had for taking his motorcycle to the mall. However, there was a diverging discrepancy as he also later stated that the reason for taking his motorcycle to work was because his girlfriend took that car and that he would have taken it if she had been using it. His **contextual reality** lead him to take his motorcycle. The bicycle user said that she enjoys biking and usually uses that mode of transport unless it is raining. Under rain circumstances she will sacrifice her enjoyment of biking and instead use another mode of transport. The variety of transport modes taken by the users who openly responded the *enjoyment* **self-preference** indicates that public transport can be an *enjoyable* experience.

The *carrying more stuff* **self-preference** was the second most frequent response, approximately 6/25 of the responses. *Carrying more stuff* may be important to shoppers as the whole act of shopping consists of purchasing items and can often mean that multiple items are purchased at the mall due to the sheer variety of stores that the mall offers; approximately 200 boutiques. One may find it easier to place those items in the car to transport those items home. A discussion with one Emporia participant supports this hypothesis as he stated that he drives the car to the mall when he is purchasing items in the mall because it is too much to carry while biking. On the other hand, he will bike if he knows that he

is not purchasing many items. This clearly demonstrates how *carrying items* affects his transport mode decisions.

The third most frequent **self-preference** response was *time*. *Time* was openly responded by 5/25 participants which is a significant reduction in comparison to the Sony group. Almost all of the Emporia shopper participants that openly responded *time* as a **self-preference** exclusively used their cars to get to the mall. Markedly, most of these participants who stated the *time* **self-preference** lived outside of the city. This reduction in frequency of the *time* **self-preference** for the Emporia case may be a result of less participants living outside the city of Malmö in comparison to the participants that live outside of Lund for the Sony case. Furthermore, this could have the implications that public transportation to get to the Emporia site in Malmö is rather limited from outside of the city. However, this cannot be positively concluded because I did not consistently ask where all the participants lived during the Sony case interviews.

In connection back to my integrated behavior model, it is apparent that **self-preferences** vary from the Sony case and Emporia case. It would appear that individuals have different **self-preferences** depending on their circumstances. This assumption can be drawn since Sony employees can also be consumers at the mall.

5.2 Less Frequent Self-Preferences

This section will discuss some **self-preferences** that were less frequently responded by participants and correlations that I found of interest. Although, not all will be covered due to the thesis word limit. The full list of self-preferences can be found in appendix A.

5.2.1 Sony Employee's Less Frequent Self-Preferences

The second most prominent **self-preferences** given by the Sony group were *convenience* and *freedom*: 7/25 respondents and 6/25 respondents, respectively. I almost combined *freedom* and *convenience* into one category assuming that the respondents were referring to the same concepts; however, when I analyzed the participant's modes of transport it became very clear that these two **self-preferences** were responded by participants that had completely different transportation behaviors. Of the seven participants who stated *convenience*, only one of them used a car to get to work and he said that he must drive a car because he travels to different sites for work. According to my integrated behavior model, this would be considered **contextual reality**; situational circumstances that highly influence one's behavior. The remaining six used bicycles, buses, or a combination of train/bus: 3, 2, and 1, respectively. I found a strong correlation between the respondents who stated *convenience* and their

weighted response to the **control** factor closed ended question; "do you have easy access to several forms of transport to get to Sony?". All of the respondents gave the strongest response to acknowledging that they have easy access to other forms of transport; **control**. This would entail that each participant could use various forms of transport but chose, in general, chose not to drive. There is the possibility that they do not own the car, as this question was never asked; however, it is not out of the question to presume that they do own a car based on incomes of employees at Sony. According to my integrated behavior model (see fig 3), I have outlined **perception**, **beliefs**, and **self-preferences** as the inner pressures that motivate us. The *convenience* self-preference is of interest because almost all of these respondents **perceived** the car as the most used vehicle to come to Sony and the average weight response of their **beliefs** towards environmental preservation in transportation was scaled as only slightly important. Nevertheless, they still chose not to drive a vehicle. This has the implications that their descriptive norm, **perception** that everybody is driving, has not significantly affected their transport choice even taking into account that their **beliefs** are that they, in general, do not care much for the environment. The definition of *convenience* is "a quality or situation that makes something easy or useful for someone by reducing the amount of work or time required to do something" (*Merriam-Webster*, n.d.). Yet, none of the convenience respondent's openly responded *time* which means that we can presume that there must be a low amount of work involved in their chosen transport choices. However, this still raises questions for discussion because three respondents use their bicycle to commute to work which does take more work to do compared to sitting on a bus or driving. Unfortunately, this will never be completely clear because I never dove deeper by having the participants further explain how they define *convenience*. Nonetheless, it would appear that the *convenience* **self-preference** for those who do not drive may be a significant overpowering factor over **perception** and **beliefs**.

On the other hand, when participants gave the *freedom* **self-preference** response they automatically said something along the lines of the ability to come and go as pleases. Many considered public transport buses to be limiting because one must wait for the bus on a certain timetable. One participant went further on to say that in the mornings there are many people using the buses to go to work and sometimes the buses get filled very quickly. When this happens you have to wait until the next bus comes which means that you might end up coming late too work. All of the seven *freedom* self-preference respondents drove their car to Sony and all of the seven also openly responded *time*. Once again referring back to my integrated behavior model (see fig 3) I have made it clear that I consider **perception**, **beliefs**, and **self-preferences** as the inner pressures that motivate us. This sub-group of

participants that selected *freedom* is of interest because analyzing their motivations highlights that their driving behavior is not only strengthened by their **self-preference** of *freedom*, the ability to come and go as they please, but by their **perceptions** and **beliefs** as well. The majority of this sub-group **perceived** driving as the most common form of transport which may reinforce their driving behavior as, in their eyes, everybody is doing it. In addition, their average **belief** value of environmental concern was marked at only slightly important. The weighted values placed on these factors by this sub-group suggest that it may be difficult to break their driving behavior due to the strength of their inner pressures to continue commuting with a vehicle.

Less frequent Sony **self-preferences** were also *costs* which 4/25 participants openly responded. The sub-group that responded *costs* similarly rated their value of the environment from a range of neutral to not caring at all. One of these participants stated that he drives to work because he has no other options to come to work and if he had access to public transport he would take it because it would probably be cheaper. A different participant who drives said that public transportation would take an extra 3 hour round-trip which would take time away from spending with the kids. He also explained that he would rather drive to an electric car to work if it was cheaper. However, I missed an opportunity to further deepen this conversation by asking if it was the possibility of saving money from gas or to be more environmentally friendly. This participant gave a neutral weight when asked the closed question about his **beliefs** towards how much he values the environment. This could mean that there is the possibility that the environment is a factor that affects his decision making. At the same time, he was also neutral when responding to whether **WTA** or **cash-out** would affect his transportation mode. This could also mean that *costs* are what steers his statement about the **self-preference** to drive an electric car due to saving money on gas. From the inquired information, it is difficult to pinpoint this participant's level of receptiveness to *cost* or *environmental* concerns. Possibly, it is a combination of both, *environmental* concern in transportation and *costs*, which influence his decision to want to drive an electric car. Notably, *costs* were never openly responded by any of the Emporia interviewees when asked about their self-preferences.

5.2.2 Emporia Shopper's Less Frequent Self-Preferences

Health was an open **self-preference** response by only a small portion of the employees, 3/25, and these respondents also either walked or biked to work. These three participants live within Lund and allows them the option to bike or walk when others that live farther away possibly cannot or opinion that it will take too long of a time.

Another **self-preference** that three participants mentioned was the *comfort* they get from certain modes of transport. Two of the participants drove to work and said that driving the car is smoother and one can listen to the radio while driving. Even though many people have mp3 players in the current era of technology, the *comfort* of listening to the radio may be higher in that particular participant's car due to more speakers, more stations, higher quality, and so forth. Or, maybe they even enjoy the privacy of listening to the radio in their own vehicle. The other participant mixes between biking and using his moped. This participant said that his sweating and personal hygiene plays a role when deciding between the two options. When he takes the moped to work he does not get sweaty in comparison to when he bikes. One possibility may be that the he values his appearance at work, concerned about what his co-workers think about him, and it is dependent on who he interacts with on the particular day; such as if he has a meeting.

5.3 Perceptions and Descriptive Norms

In my integrated behavior model, I have applied normative conduct theory which consists of two main parts; descriptive and injunctive norms. This section will focus on the descriptive norm feature which presumes that our behavior can be shaped by our **perceptions** and our actions will follow that same perception because it is a norm. All participants were asked the open question of what they perceive as the most commonly used form of transportation which is how I would decipher all participant's descriptive norms. Sony participants were asked in reference to the Sony location and Emporia participants were asked in reference to the Emporia location.

5.3.1 Sony Employee's Perceptions and Descriptive Norms

Roughly 66% of all Sony employees that were interviewed **perceived** driving the car to work as typical behavior for that location. They possibly make this observation when they park in the lot and walk past all the other parked cars on their way to the office. Normative conduct theory suggests that this car driving perception will reinforce car driving behavior. The remaining responses by all other Sony employees **perceived** bus use as typical behavior. One might assume that bus users may **perceive** that most employees use buses because all these transport users are grouped together as they commute to work. However, this was not the case and slightly more than half of the bus users stated they the perceive car driving to be typical behavior. Although, bus users who **perceived** bus use as the most common form of transport to Sony should be having their bus behavior reinforced, in theory.

5.3.2 Emporia Shopper's Perceptions and Descriptive Norms

The Emporia group provided a different ratio of **perceptions** between cars, buses, and trains. A little over 33% of all Emporia participants responded that they observe car driving as typical behavior to the mall. However, only roughly half of these respondents used their car to drive to the Emporia location. The remaining half of respondents of this sub-group, who **perceived** car driving as typical behavior, were a mixture of bus and bicycle users, and walkers. This is important to highlight because this has the implications that the other car drivers are **perceiving** public transport as the most common used transport and despite their **perceptions** they still choose to drive. According to my integrated behavior model this would mean that the **perception** factor is weaker in comparison to one or several of the other factors outlined; **beliefs**, **self-preferences**, **control**, and **contextual reality**.

5.4 Beliefs and Injunctive Norms

In my integrated behavior model (see fig 3), I have deviated away from Ajzen's (1991) planned behavior and redefined **beliefs** as the psychological state in which one believes that an idea is true and underpinned it in the injunctive norm feature of normative conduct theory. Data was gathered for injunctive norms, group approval of transportation choices and the norms of how people *should* behave, which is assumed to shape their **beliefs**. For group approval, data gathering provided unexpected results in the Sony and Emporia group. Sony employees were asked if their co-workers approved of their transport mode choice to work and Emporia workers were asked if their closest peers approved of their transport mode choice to the mall. Overall, almost everybody replied that it was a topic that was never discussed among their co-workers or closest peers.

5.4.1 Sony Employee's Beliefs and Injunctive Norms

For the Sony case, only one Sony participant said that his daughter is always reminding him to care about the environment; which was out of the scope of my inquiry as I was more interested in co-worker approval. Alternatively, the Sony participants were then asked if there was any pressure from Sony to take sustainable transport. Only 3/25 employees stated that Sony encourages employees to consider the environment through means such as carpooling and less traveling in order to cut down on *costs*. One of these employees explained that Sony does send occasional emails that employees should consider and ought to be environmentally friendly. However, in general, almost all Sony participants felt that sustainable transport was not a message particularly pushed by the company. There is the possibility that employees are not reading the Sony environmental emails due to the mass amount of intra-emails that are commonly sent within any large company. Employees may be automatically deleting these emails without even opening them as they are constantly bombarded with emails all day

long. Injunctive norms as the underpinning of **beliefs** in my integrated behavior model turned out to be insignificant grounds as an influence of **beliefs**.

Subsequently, participant **beliefs** were quantitatively weighed by directly asking how much they value the environment when making transport mode decisions and how much they feel that other people *should* value the environment when making transport decisions. The Sony case data, compiled as a whole, revealed that all employees at Sony shared *neutral* care about the environment when they make decisions in how they are going to travel to work. The breakdown of these sub-categories by employee transport mode was as follows: Sony car users had a *neutral* rating, bus users had a *slightly caring* rating, bicycle users had a *strongly caring* rating, and walkers had a *slightly not-caring* rating. It is of interest that the walkers seemed to care less about the environment keeping in mind that walking is extremely sustainable. However, there were only two walkers which was the least of all data points for the whole Sony group. This lack of data points may have been insufficient to use in the results.

The Sony participants were then asked how much other people ought to consider the environment in deciding how they will choose their transport mode to work. The average rating for the whole Sony group was *strong*; people should consider sustainable transport. The breakdown of these sub-categories by employee transport mode was as follows: Sony car users had a *strong* rating, bus users had a *very strong* rating, bicycle users had a completely *neutral* rating, and walkers had a *moderate* rating. Again, it is surprising that the walkers and bicycle users had weaker opinions towards considering the environment when making transport mode choices. Although, this could be from the lack of data points. The idea of placing an agenda onto another co-worker did strike a chord with some participants. They expressed that this could become uncomfortable if it were to actually happen. One walker stated that the idea of pushing environmental values on co-workers could be

"difficult and sensitive to talk about this with people".

One car user stated they

"don't want to impose value on co-workers too much".

This may be a result for the desire to keep a friendly work environment that does not become too personal.

5.4.2 Emporia Shopper's Beliefs and Injunctive Norms

The Emporia case, unlike the Sony case, revealed additional interesting results which fit under **beliefs** and injunctive norms. Firstly, the Emporia group average for their environmental value towards transport mode choice to the mall was *neutral*. The breakdown of these sub-categories by shopper transport mode was as follows: shopper car users had a *moderate* rating, shopper train users had a *slightly not-caring* rating, bus users had a *moderate* rating, bicycle and walker users had a *strong* rating. This data set was not particularly unusual except that train users transport mode choice is actually more sustainable than car users. The discrepancies take place when the Emporia participants were asked about how much they feel other people ought to consider the environment in deciding how they choose their transport mode to the mall.

When asked about how much others ought to care about the environment in regards to transport, the average weighted response for all Emporia participants was *very-strong*. The breakdown of these sub-categories by shopper transport mode was as follows: shopper car users had a *very-strong* rating, shopper train users had a *very-strong* rating, bus users had a *very-strong* rating, bicycle and walker users had a *moderate* rating. The results are peculiar because Emporia car users have stronger feelings that others should care about the environment when making their transportation choices in comparison to Sony employee responses to the same question. However, as stated, this may be a result of the personal relationship with other Sony co-workers as they must interact with each other in a job setting while Emporia shoppers have no relationship or interactions with other Emporia shoppers.

It can be assumed from my integrated behavior model that that those participants who choose to drive while both, simultaneously electing they highly value the environment in transport decisions and feel that others should do the same as well, are more heavily influenced by other factors; **contextual-reality**, **perceptions**, **self-preferences**, and/or **control**. This can be concluded because the **belief** factor was not strong enough to make car drivers choose more sustainable forms of transport keeping in mind that almost all car drivers, of both Sony and Emporia cases, also rated car driving as *moderately not good* for the environment.

5.5 Outside Pressures – WTP, WTA, Compensation, Free bicycles, and Free Alcoholic Beverage

The primary focus of this section will be on the outer pressures of my integrated behavior model (see fig 3)[4]. **WTP** and **cash-outs** have been researched as effective techniques from changing driving transport

[4] The survey can be seen in Appendix A and B

behavior to alternative modes such as carpooling and public transport (Enoch, 2002; Hess, 2001; Li et al., 2008; Shoup,1997; Van der Waerden et al., 2006). **Free bicycle** schemes in Denmark are also an outer pressure that has been researched to be effective in switching transport away from motor vehicles (Marshall et al., 2000). Additionally, **public transport ticket compensation** with the purchase of an item in the mall was a hypothetical scenario for the Emporia case study. Lastly, a **free alcohol offer** was tested with the Sony case and Emporia case to dwell into uncharted territory and see the potential it had towards affecting transport decisions.

5.5.1 Sony – WTP and Cash-Outs

When posed with the hypothetical scenario[5] of paying fees to park in the Sony parking lot, **WTP**, the average quantitative rating response for the 13 Sony car drivers was *neutral* to switching transport modes. 3/13 drivers weighted a *strong* rating to changing transport modes. 4/13 drivers weighted a *moderate* rating to changing transport. 1/13 was had a *neutral* rating to changing transport. The remaining 5/13 said that they would *definitely not* change their transport behavior. There is a significant amount of employees that would seem to be influenced by parking fees. This does confirm and support research articles that applying economic cost pressures, **WTP**, can influence driving behavior towards other forms of transport (Enoch, 2002; Hess, 2001; Li, Zhang et al., 2008; Shoup, 1997; Van der Waerden et al., 2006).

Sony employees were then faced with the hypothetical scenario of a **cash-out**, on a daily basis, to not park in the Sony parking lot. Similarly, the average quantitative rating of the 13 drivers when faced with the **cash-out** scenario to not park in the parking lot was *neutral*. 1/13 chose a *strong* rating to taking the cash-out and changing transport. 3/13 participants were *moderately* in favor of changing transport modes. 3/13 participants were *neutral* towards changing transport. While the remaining 6/13 elected that they would *definitely not* take the **cash-out** to change their transportation behavior. One participant who opposed the hypothetical **cash-out** stated that he would instead consider changing his job because he has no other transport options for coming to work. There is a significant amount of employees that would seem to be influenced by a **cash-out** scheme. In reference to the previously discussed companies and organizations that have **cash-out** schemes (hospitals, Vodafone, and Pfizer) my

[5] Responses to hypothetical scenarios do not necessarily mean that participants will behave in that manner when actually faced with the given scenario in reality.

data confirms and supports, see section above, that applying economic compensation, **WTA**, can influence driving behavior towards other forms of transport[6].

5.5.2 Sony – Free Bicycles

According to a **bicycle offer** scheme that took place in Aalborg, Denmark, success was achieved in to changing people's transport behavior; bicycles were able to replace 9% taxi use, 37% bus use, 6% company car use, and 33% private car use (Marshall et al., 2000). However, when a hypothetical **free bicycle** offer provided by Sony was presented to driving Sony employees the findings were not as promising as the results of the actual implementation in Denmark. One person said that they *would definitely* take the **bike offer** to commute to work; this person already walks to work and stated that he does not own a bike. 3/18 selected a *neutral* weight in considering taking the offer and biking to work. 15/19 employees selected that they would *definitely not* switch their transport mode to using a bicycle to commute to work and several said that it was not a possibility because they live too far away. The possibilities of transferring a **bike offer** scheme to Sony that is similar to what they have done in Aalborg does not seem to have the same effectiveness. This may be due to spatial circumstances as many Sony employees may live outside the city of Lund and biking too far of a distance may not be desired. Furthermore, even using a mix of transports, such as biking to the bus station and switching to the bus and then continuing by bike again, is out of the question because bikes are not allowed inside buses or be placed on special bike racks in front of buses.

5.5.3 Sony – Alcohol Beverage Offer

When Sony driving participants were faced with the scenario of being given an after work **alcoholic beverage**, to deter them from driving their car, only one participant said that he would consider taking the drink and he selected a weighted value *slightly above maybe*. He also stated that if he did take the drink it would only be on Thursdays and Fridays. The other 12 participants selected that they would *definitely not* take the drink. The findings of using **alcohol beverage** as an outer pressure reveal that it may not be an effective measure to prevent people from using their vehicles to commute to work. Although, this may be an entry point of discussion for thinking of other outside pressures, external of economics, which can shift people's transport behavior to a more sustainable mode.

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[6] It must be noted that the participants were never given a fee or compensation value when posed with the questions during the survey and this may have affected their responses. Having a high fee or compensation value and vice-versa may have inclined them to answer differently.

5.5.4 Emporia – WTP

Unlike Sony, the Emporia parking structure already has a parking fee implemented which is the cheapest in the area[7]. With this **WTP** outer pressure presently in place, my questionnaire inquires how these fees may have influenced driving shoppers transport decisions before they decided to use their vehicle; shoppers were asked a closed quantitative question in regards to how much their transport behavior choice was affected by the current parking fees; **WTP**. There was no **cash-out** scenario for the Emporia case and they were instead offered a **free public transport ticket** with a purchase. There were 13 vehicle drivers, including one motorcycle driver, who were faced with the question pertaining to **WTP** and **public transport compensation**. Only two participants gave a rating that they *definitely* considered taking other forms of transport due to parking fees; **WTP**. Only one person gave a rating that parking fees were *moderately* considered. The remaining 10 responded that the parking fees *definitely did not* matter in their decision to drive a vehicle. Conversely, the results of this **WTP** inquiry may not be a good representation of its effectiveness because these shoppers already made the decision to drive their vehicle. It may be a possibility that the respondent does not recall if parking fees, **WTP**, were a raised issue in the past leading to a strong response that parking fees did not play any role in their decision. This is a very different condition in which the question was presented; compared to the Sony case. The Sony case had the topic introduced as a hypothetical scenario and was asked to those who have not yet taken an action under that circumstance. This may cause one to think further before they give their weighted response and may have improved parking fee potential effectiveness in the Sony case.

5.5.5 Emporia – Public Transportation Ticket Compensation

Instead of being compensated to not park in the Emporia parking lot, drivers were faced with the hypothetical scenario of a **free public transport ticket** if they made a purchase at the mall to discourage them from driving. When faced with this scenario 3/13 vehicle drivers selected that they *would definitely consider* taking public transport if they were offered a **free public transport ticket** after making a purchase. One of the participants that definitely would consider changing their behavior stated that he cares about the environment and therefor purchased a diesel care because he feels that it is more environmentally friendly. The remaining 10/13 vehicle users rated that they would *definitely not* switch to another transportation mode. One of these participants said they would not switch because he would be forced to carry all his bought items home which would be very difficult. This may have the implications that the *carry stuff* **self-preference** is a stronger factor than a **compensated public**

[7] 4 sek per every 30 min for the 4 hours followed by 10 sek per 30 min afterwards. After 8 hours it's a charge of 120 sek for the whole day.

transport ticket for this particular participant. Another subject who stated that they would *definitely not* switch transport explained that the only way they would take public transport when faced with this scenario was if there was a direct bus that goes to their home. Additionally, a different participant stated that the only way her decision could be changed was if public transport was always free and went on to further explain that she hates the whole process of buying tickets. Even though the majority of participants weighed that they would *definitely not* change their behavior, there were still a significant amount of participants that said they would change their behavior. It is interesting to see the extremity of responses as they were either for definitely or definitely not considering changing their behavior when faced with the hypothetical scenario of **free public transport compensation**.

5.5.6 Emporia – Alcoholic Beverage Offer

The final outward pressure that was hypothetically designed for the Emporia shoppers was also the use of alcohol to deter their use of vehicles. When faced with the circumstance that Emporia offered a **free alcoholic beverage** for visiting the mall 2/13 vehicle driving shoppers ranked that they would *definitely take* the drink. One of the two also stated that they would drive home while[8] the other said he would have switched his transport mode in preparation of accepting the drink. 1/13 rated a *neutral* response that they might take the beverage. The remaining 10/13 vehicle drivers rated that they *would definitely not* consider taking the drink in order to change their transport behavior. The effectiveness of an **alcoholic beverage offer** as an outer pressure appears to be the least effective in comparison to offering **free public transportation** with the purchase of an item. Although, it is important to point out that outer pressures, outside of economics, show some promise as an alternative to the more common behavioral changing techniques (**WTP** and **cash-out**) and at the same time may offer a better experience if applied.

6 Future Outlook

After extracting what appear to be the most significant factors that influence people's decisions when they decide how they will choose their transport modes between the Sony and Emporia cases it can be established that different actions can be accordingly implemented which may increase success of changing transport behavior. This section will first outline the Sony case followed by the Emporia case.

[8] As discussed in Chapter 4 Swedes, Alcohol, and Drinking; drinking in driving in Sweden is socially unacceptable (*European drivers and road risks*, 2004). This person was not Swedish.

6.1 Sony's Future

Gathered data from the Sony case revealed that *time* is a highly frequent **self-preference** that motivates how employees commute to work. In the consideration of *time*, Sony may already be in the process of taking effective measures to change transport behavior. Starting in May 2014, Sony will shut down a parking lot that is directly next to the office buildings which will force many Sony employees to use a parking structure that is farther away from the offices and takes about 10 minutes to walk. One Sony employee who is involved in keeping her co-workers up to date on parking infrastructure progress predicted that employees will not be pleased when the nearest parking lot gets shut down and went further on to describe that

> *"people will be screaming and shouting and so annoyed when they have to park in the far away lot. Especially, in the winter. It will be wet, snowy, dark; that will be a problem".*

While this approach could be effective, it could also possibly negatively affect the satisfaction of the employees. This opens the discussion for alternative actions that can be implemented which change transport behavior and simultaneously increase satisfaction. This thesis has examined the potential of applying different types of outer pressures (through hypothetical scenarios of **WTP, cash-outs, compensation,** and **bicycle** and **an alcoholic beverage offer**), employee **perceptions** on what they observe as the most common use of transport, **beliefs**, **contextual reality**, and **control**. The four analyzed hypothetical outer pressures presented from most effective to least effective for the Sony case was as follows: **parking fees, compensation, free bicycle offer,** and an **alcoholic beverage offer**. Of course, other outer pressures can be tested which may be even more effective towards creating sustainable transport behavior. When Sony employees were faced with their **perceptions** of what is the most commonly used form of transport to Sony it was discovered to be cars. Normative conduct theory (Cialdini et al., 1990) would suggest that driving behavior is being reinforced. However, my investigation shows that descriptive norms may not play as significant of a role as anticipated in influencing transport decisions as there were also bus users who **perceived** cars as the dominant form of transport at the Sony facility. When employees were posed with the question about injunctive norms, whether they received approval from co-workers or pressure from the company to choose sustainable transport, almost everybody said that it was a topic that had never been discussed. This data reveals an opportunity for Sony to improve and strengthen their environmental transportation campaigns within the company. This would strengthen the injunctive norm of my integrated behavior model because as of right now it seems to be almost completely lacking. This method of strengthening transportation

campaigns can only be speculated but may have its advantages. Studies show that normative campaigns have been effective at changing behavior when properly focused (Cialdini et al., 1990; Rimal & Real, 2005). This may also be an alternative that may have less of a negative impact on employee attitudes, compared to a parking lot that is placed further away, thus providing more satisfaction if a transportation mode switch were achieved. My gathering of **control** data revealed that car drivers felt that they had the least amount of transport options while bus users and walkers felt that they had the most options available to commute to Sony. This would suggest that public transport infrastructure is not easily accessible from all the various places that Sony employees live. However, building a public transport infrastructure that caters to every single person would be very difficult.

6.2 Emporia's Future

After retrieving and analyzing data from the Emporia case, it was discovered that *time*, *enjoyment*, and *carrying more stuff* were frequently mentioned **self-preferences** openly expressed by shoppers. There was also convergence of data as all shopper participants who openly responded *time* were also revealed to be car drivers to the mall. Several participants that live in Malmö stated that public transportation is well designed within the city. This may imply that public transportation infrastructure to get into the city of Malmö is not easily accessible for everybody who lives outside of Malmö. Re-assessing and improving public transport routes may aid in switching shoppers transport behavior for those who live outside of Malmö. Although, creating routes for every single person would be very difficult. Furthermore, the *enjoyment* and experience of taking public transport should be heavily considered when designing public transport outside, as well as within, Malmö because *enjoyment* was a frequent **self-preference** open response by participants. Lastly, the ability to *carry more stuff* was a **self-preference** that was also frequently responded and this can maybe be resolved by providing shoppers with transportation carts that they can take onto to the bus or train or walk home with. However, this would be a rather difficult piece of equipment to track and ensure that it is returned.

In regards to Emporia shoppers and outer pressures, my interviews/surveys revealed mixed results due to the design of my survey. To re-iterate, the Emporia parking lot already had a parking fee, **WTP**, in place when I collected my data. Instead of asking if the parking fees had made them consider taking public transport, it would have been better to ask them if raising the parking fees would force them to consider taking another form of transport; keeping in mind that the Emporia parking lot is the cheapest structure in the whole Hyllie-Malmö area. This might have provided more meaningful data. There is the possibility that raising parking fees would become a deterrent for driving to the mall. When

compensation in the form of a **free public transport ticket** with a purchase was hypothetically presented to participants there was some positive response to changing transport modes. When an **alcohol beverage offer** was hypothetically introduced the results showed the least potential of all the outer pressures; **WTP** and **ticket compensation**. The information gathered based on **perceptions** showed that shopper perceptions did not seem to affect their transport decisions as much as expected. **Perceptions** turned out to not be a strong factor in my integrated behavior model. Similar to the Sony case, the responses gathered pertaining to injunctive norms revealed that there was not any pressure from participant's inner circles or the mall to take public transportation. Likewise, this provides an opportunity for the Emporia mall to develop and promote campaigns that one should take sustainable transportation to the mall. This could maybe be provided by signs in every store at the mall by the cash register where shoppers purchase items so that they are constantly reminded that sustainable transport is important.

7 Discrepancies

There were numerous patterns of divergent disagreements in responses and data misalignment for the Sony case, which open an opportunity of further exploration. There was a discrepancy in almost 33% of the Sony participants in regards to the weighted quantitative rating of how much they value the environment in regards to transport to work and their intention to change transport if they were hypothetically told that their current transport mode is not good for the environment. These participants gave a ranking they *very strongly* value the environment and yet when they were hypothetically told that their current transport mode to work was bad for the environment they gave a completely opposite response that ranked that they would *almost definitely not* change their mode of transport. Of course, there are many reasons pertaining to why one may not change their transportation mode. Half of this sub-group of participants stated that they have easy access to other forms of transport, a high level of **control**, but also explained that the commute time would then be much longer. Two of these participants said that they have access to other forms of transport but also explained that they drive the car so they can pick up their children after work. This exemplifies how **contextual reality** can prioritize over other the other factors leading to one's behavior in my integrated behavior model. The reality for these two participants is that they are faced with other responsibilities which override their care for the environment, **perceptions**, **beliefs**, **self-preferences**, and **control**. These circumstances push and pull the balance of their behavior and are the reasons that they behave the way they do. This example also supports my integrated behavior model as I pointed out a possible

disconnection with **contextual reality** and the **intent** of performing behavioral change. In this case, participants had strong **beliefs** in environmental support but nonetheless had no **intentions** of changing their behavior in regards to transport when presented with a certain scenario. As suggested, they prioritize other aspects of their lives which more heavily dictate their behavior.

In comparison, the Emporia group had only 3/25 participants who had similar divergence data disagreement between highly valuing the environment, **beliefs**, and the **intent** to change their behavior if hypothetically told that their current transportation mode to the mall was damaging to the environment. Of the three participants that displayed divergence it is of interest that 2 of them openly stated that they care about the environment in regards to their transport decisions when I asked the open question about their **self-preferences**; this was before I asked the question about how much they value the environment. Their open **self-preferences** about the environment were strongly expressed as one stated

"everybody should think about the environment".

The other participant stated

"I wouldn't take the car if I had one…we have the option in Malmö to use public transport that is reliable, safe, and comes regularly".

However, their responses to the **intention** of changing their transport modes if they were hypothetically told that their current transport is not good for the environment opposed their environmental **beliefs**; as one participant gave a *neutral* weight and the other participant said *would definitely not* to changing their transport behavior. The fewer number of respondents that responded with this divergence, in comparison with the Sony case, may have been because there is a chance there were more participants that live within a closer proximity to the Malmö mall destination; whereas more Sony employees may live outside of the township of Lund. After all, Malmö's population consists of 312,994 while Lund has a smaller population that consists of 114,291 (*Statistics Sweden: population statistics*, 2013). The chances are much higher when asking 25 random people in the Emporia mall that they will live in Malmö. However, this can only be speculated as I did not ask all of the interviewees where they live.

8 Conclusion

When reflecting upon my integrated behavior model (fig 3), it is apparent that all factors (**perceptions, beliefs, self-preferences, WTP, WTA, compensation, other outer pressure mechanisms, control,** and **contextual reality**) are all in competition with one another. Ultimately, the most dominating factor will

dictate the subject's behavior. Of all the inner pressures I have outlined (**perceptions, beliefs, and self-preferences**), it would appear that **self-preferences** play a much stronger role in transport decision making than the other inner pressures that I have outlined; **perceptions** and **beliefs**. With this in mind, it may be possible to change behavior if we focus on strengthening inner pressures that will steer behavior towards sustainable transport while simultaneously weakening other inner pressures that steer towards unsustainable transport behavior. An example of this would be forcing Sony employees to park in a further away parking lot which would affect the prominent discovered *time* **self-preference** and simultaneously having sustainable transport campaigns within the company. If we want to change behavior externally of inner pressures then one can introduce various outer pressures (**WTP**, **cash-outs**, **compensation**, and **others**) in order to override the strength of inner pressures in directing behavior. Participants that were faced with various outer pressure scenarios gave responses that presented potential for behavioral change towards more sustainable transport. The analysis and conclusions drawn from this thesis can hopefully provide insight on the processes that lay behind transport decision making. This knowledge can be of importance for policy planning within transport development towards recognizing that it is not only infrastructure which must be considered in planning. Psychological behavior must also be included as a complementary and effective tool to guide people towards choosing sustainable transport.

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Appendix A

Openly responded self-preferences and the number of participants that stated it

Sony Case (25 participants)

Time	18
Convenience	7
Freedom	6
Comfort	3
Health	3
Costs	3
Environment	2

Emporia Case (25 participants)

Enjoyment	7
Carry more stuff	6
Time	5
Comfort	4
Freedom	4
Environment	3
Health	3
Closeness	2

Appendix B

Sony Survey

1. How did you get to work today?

Open-Ended Questions (Qualitative)

2. For this section, please list why you prefer _____ to the Sony. There are no good or bad, right or wrong answers, I am interested in your personal opinions. Please list the first thoughts that come immediately to mind.
3. What are the reasons that you choose to travel by _____? Please list the thoughts that come immediately to mind.
4. What is your observation of the most commonly used form of transport?

Closed-Ended Questions (Quantitative)

5. Perception (descriptive norm) – Are the majority of Sony employees using the most environmentally friendly mode of transportation?
6. Beliefs – Do you highly value the importance of preserving the environment when you choose to _____?
7. Injunctive norm – All Eriksson employees should take the environment into consideration when they transport to work?
8. Eriksson promotes that all employees should take the environment into consideration when they transport to work?
9. Most of my co-workers approve of my mode of transport?
10. Control – Do you have easy access to choose between different types of transportation to get to Sony?
11. Intention – If I told you that _____ is not environmentally friendly would you plan to change to a more environmentally friendly type of transportation?
12. WTP – If a parking fee were imposed to park in the lot, would you consider other forms of transport such as carpooling, trams, buses, etc?
13. Cash-Out - If you were compensated with money to NOT park in your parking spot on a daily basis, would you consider taking the cash and switching transportation modes?
14. Free Bike Offer - If free bikes were provided by Eriksson, would you switch your transportation mode and begin biking?
15. Would you switch to public transport if Sony offered a free after work beer or drink that was loaded on your employee card?

Emporia Survey

1. How did you get to the mall today?

Open-Ended Questions (Qualitative)

2. For this section, please list why you prefer _____ to the Emporia. There are no good or bad, right or wrong answers, I am interested in your personal opinions. Please list the first thoughts that come immediately to mind.
3. What are the reasons that you choose to travel by _____? Please list the thoughts that come immediately to mind.
4. What is your observation of the most commonly used form of transport to Emporia?

Closed-Ended Questions (Quantitative)

5. Perception (descriptive norm) – Are the majority of Emporia shoppers using the most environmentally friendly mode of transportation?
6. Beliefs – Do you highly value the importance of preserving the environment when you choose to _____?
7. Injunctive norm – Everybody should take the environment into consideration when they transport to work?
8. Most of my inner circle, family and friends, approve of my mode of transport?
9. Control – Do you have easy access to choose between different types of transportation to get to the mall?
10. Intention – If I told you that _____ is not environmentally friendly would you plan to change to a more environmentally friendly type of transportation?
11. WTP – Have the mall parking fees ever made you consider taking other forms of transport such as walking, biking, buses, or the train before you decided to come to the mall?
12. Public Ticket Compensation – Would you take public transport, buses or train, if it were made available for free (one-time to and from) to those who purchased an item in the mall?
13. Free Alcohol Offer - If you drove, would you switch to public transport if Emporia offered a free drink or glass of champagne?