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Christopher Martin

Shifting Gears

AUTOMATED DRIVING ON THE EVE OF AUTONOMOUS DRIVE

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As we encounter the dramatic imagery and predictions about self-driving cars that appear almost daily in the media it can become easy to think of automated driving as being a revolutionary new experience. But is it? Why is it that we can drive to work and arrive realizing that we were lost in thought the whole way there? Why can we feel comfortable catching up with an old friend while hurtling down the highway in a steel and glass box on wheels? Sometimes it can come to feel as though the way we are driving is already automatic.

Through the concepts of practice, perception, and embodiment this book analyzes material collected through interviews and drives conducted in Sweden and the United States as well as historical materials from the early and "golden" ages of the American automobile. In doing so it seeks to use cultural analysis in order to shed light both on the automation of driving in historical and contemporary everyday practice, and on how these encounters with automation can shape how a drive is experienced and how a driver might understand new forms of automation in the car.

Christopher Martin is an ethnologist holding a B.Sc. in Anthropology from Ball State University and an M.A. in Applied Cultural Analysis from Lund University. *Shifting Gears* is his doctoral dissertation.

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Automated Driving on the Eve of Autonomous Drive

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Faculty of Humanities and Theology
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And thank you, reader, for giving me your time to take you down this road ahead.

Lund, February 16, 2020

Chapter 1
Introducing the Study: Aims, Concepts, and Methodologies

Aims and Questions

Both car owners and passengers often perceive driving as an unremarkable and routine activity. Yet this unremarkableness is, in its own way, quite remarkable. To drive well requires a large array of physical actions and perceptions to be constantly and smoothly managed in order to keep a large piece of metal on rubber wheels moving at significant speed down potentially very crowded roads and highways. It would be easy to forgive a driver for feeling overwhelmed at the experience.

And yet the average driver is not. The car can even come to take on attributes of a living room complete with steaming cups of coffee, comfortable seats from which to perhaps talk to a friend on the phone or begin to mentally drift off, and music to lose oneself in. Indeed, we can feel so much at ease that I, and many other drivers, have experienced the phenomenon of being so lost in our thoughts that we arrived at our destination without being especially conscious of how we even got there or what happened along the way. It is sometimes as though the way we drive is *already* automatized.

But if this is so, why might so many drivers be so hesitant to embrace the idea of operating an autonomous drive car? Many polls seem to suggest that these hesitations are quite widespread. One such poll conducted by the American marketing research firm J.D. Power and Associates found that the percentage of car owners in the United States who would be interested in

acquiring an autonomous drive car was around 37%; a number which dropped to 20% if respondents were informed that the hypothetical car would cost a few thousand dollars more than a traditional vehicle (Yvkoff, 2012).

This can seem incongruous with the fact that so many of the predictions being made about autonomous drive technology can sound promising if not at times even quite utopic. Some argue that in a self-driving car we may never have to worry about traffic stops once a driverless society is upon us (Himmelreich, 2018). Others tell us that an autonomous car will possess superhuman driving skills which can significantly cut our risk of being involved in a dangerous traffic accident (Thompson, 2016). And for that matter many of these promising visions of vast improvements to our lives through automation have been present in society, and shared with us by proponents, for at least the past seventy years (Bodén, 2018). If a car is offering to take the driving tasks off our hands that we don't spend much thought on anyways, and furthermore tells us that it can make our lives safer and perhaps even better, why would anyone hesitate? What is it about driving that enables us to feel at times so at ease in our vehicles while simultaneously feeling hesitant or uncertain about the age of autonomous drive vehicles that some journalists, academics, technology developers, and manufacturers inform us that we are about to enter?

I first began to ask this question in 2015 while I was involved in the early stages of a project investigating autonomous- (or self-) driving cars. I can still vividly recall a conversation I held with a fellow doctoral student whose research involved the engineering of self-driving technologies. After expressing excitement that I shared his interest in cars he informed me that he could see little reason to ask people how they felt about autonomous cars because through engineering you could make people love them even if they do not yet realize that they will. He believed that technological progress in autonomous drive would mean that the way people previously understood the car would become instantaneously obsolete. While his views on the subject may have been extreme, they did lead me to believe there was space yet for an ethnologist in a topic so laden with engineering thinking. The technology of autonomous drive may be cutting edge but, as we will see throughout this book, drivers are already long familiar with forms of automation on their daily drives.

The overall aim of this thesis is to use cultural analysis to understand the automation of driving in present everyday practice, and the implications this has for how a drive is experienced. This is done in order to see how the existing experiences of automation can shape the orientation of drivers towards new forms of driving experiences with automation.

To tackle this aim three distinct research questions are asked which will be addressed and answered in the analytical chapters as the thesis progresses:

1. How has the car developed through time in a manner which facilitates, or hinders, automation?
2. In what ways can driving be understood as having become automated at present and what role does the technology of the car play in this?
3. What does driving become once it is automated?

The thesis is positioned to contribute towards research within the fields of practice-based studies as well as mobilities research. This positioning is in part a reflection of the influence these research fields have had in shaping my understanding of driving. But it is also a means of orientating the work towards where I believe it can make a theoretical contribution, namely in further supporting and expanding upon the importance that both routine everyday practices and forms of mobility hold in shaping, and being shaped by, society. And in order to do so I will incorporate a historical perspective in order to show examples of how this shaping has changed driving through time. These transformations in how driving is perceived permit new understandings and practices of driving to emerge while at the same time closing off others. In this way driving can be understood as a very complex cultural process and one which has never been static, even in eras well before the development of self-driving cars.

The purpose of conducting this study is threefold. Firstly, this thesis takes as a starting point the cultural analytical argument that when new objects are encountered the individuals encountering them are not blank slates, but rather they make sense of the object through already existing understandings, emotions, and life experiences (Ahmed, 2010a). I argue that if we are to speak of a future "revolution" brought on by increasingly autonomous forms of

vehicles it is important to understand how driving is experienced at present. Secondly, this thesis will seek to add towards the contributions being made in addressing a gap in much of the existing research of cars and driving in which the act of driving often comes to be taken for granted on some level. Doing so involves taking interest both in the car and in the micro-practices of driving as well as the larger cultural context that driving takes place within. This existing research gap will be discussed at greater length later in this chapter. And thirdly, the question of how people relate to automation and why they relate to it in the way in which they do is one that is being asked outside the academy as well by, among others, those involved in many facets of the introduction of autonomous vehicles; ranging from automotive designers and marketers to government agencies.

Within this thesis words such as "automatic" and "automation" will be encountered throughout the analysis. The word automation, in colloquial usage, tends to refer to a process by which a given function is made automatic through material technology, and this understanding of the word has been in usage from the beginning of its introduction into general language. The word itself is credited to a 1948 utterance of Delmar Harder, a vice-president of Ford, that what they "need is more automation" in Ford's production lines in order to compete with Chevrolet (Marshall, 1957, p. 149). This association of automation with labor persisted in subsequent years as automation came to be understood as something which handed off responsibility for a given task from human to machine (see Automation, 1956). Usage of the word in this sense today can often refer to the computer systems on board the vehicle that are involved in performing a given driving action automatically.

Indeed, this understanding of automation as it pertains to the car takes on an especial relevance now that self-driving cars, and the images associated with them, are so prevalent within automotive journalism and marketing. I was fortunate at the beginning of my doctoral studies to have the opportunity to observe and participate in research projects connected to Volvo's development of autonomous drive cars while I was with the Swedish Centre for Applied Cultural Analysis (SCACA). This afforded me an opportunity both to see how others understood automation in automobiles as well as to shape my own thinking on the matter. One early

realization I had while speaking to people was that while many drivers directly associated the idea of a car driving automatically with the specific technology of autonomous drive systems they, at the same time, spoke quite vividly of the feeling of being so comfortable in their own vehicles that driving could happen seemingly without any thought at all.

Within this thesis I do not intend for automation to be understood as solely a matter concerning material technology but rather much more broadly to include the processes by which a given drive, or a moment of a drive, is *experienced* as automatic. I will also argue that this experience comes about through more than just the usage of the material technology of the vehicle, even if it still draws and even depends upon it. One example of this in practice is the experience multiple drivers related to me of taking their car on a routine drive, becoming lost in thought, and then later realizing that they had arrived at their destination without any real recollection of what they had been doing to get there. This state is one beyond reflexivity in that the drivers have agency without apparent reflection. In this situation driving becomes almost machine-like in that so long as it is occurring everything seems as though it is taking care of itself.

"Autopilot" is encountered within this thesis as a term for this experience of driving automatically – in part because it was a metaphor utilized by several informants themselves. But in addition to this, it is also a term which has been used by other ethnologists in order to describe the state in which a range of routinized and everyday activities takes place (Ehn, Löfgren, & Wilk, 2016, p. 6). In my usage it is a metaphor which speaks to the capacity to drive in a pre-reflexive manner without a conscious reflection upon each step taken along the way. This is essential to the multi-tasking which we will see is so critical to driving in that if actions cannot be performed pre-reflexively then multi-tasking quite simply cannot occur.

To place these terms together we might say that forms of technology and practice can be marshalled by the driver to provide an *automation* of driving which enables much of driving to occur pre-reflexively, as though *automatic*. And the metaphor utilized to describe this experience of driving automatically is that of driving as though on *autopilot*. To use technology to remove control of an aspect of driving, or the entire drive, from the driver to the car is to make it capable of independent action, or *autonomous*.

As a cultural practice driving can also certainly be viewed through the prism of a given society's views towards class and gender. Later in this chapter we will encounter previous studies which have illustrated just this point. In the second chapter we will also see how expectations and allowances for who was supposed to drive, and how, were shaped by society's views on gender and class. And while I would argue that there is not necessarily a distinctly masculine or feminine way of driving automatically, or in experiencing driving pre-reflexively, one can certainly argue that automation, and the idea of control, can be associated with gendered ideals as has been observed repeatedly in other forms of automation (e.g. Crawford, 2014 and Green, Owen, & Pain, 1993).

Studies on Driving

The car, and its widespread significance and visibility in the contemporary world, has for some time provided a rich subject for study across a wide range of academic disciplines. Indeed, to present a complete overview of the research that has been conducted on cars and driving would take much more than a book to complete. What I have instead chosen to do is to present a thematic summary of some of the existing research. The examples herein have been chosen as being representative of several strands of research into the topic which are commonly encountered. In working with these research themes, I distinguish between quantified and qualified studies of cars and driving and present several examples of the areas of interest and focus that each of these two research streams take. While much of the research within both streams has great value, I will argue that there still exists a significant research gap that this thesis will contribute towards addressing.

While there is an obvious risk of over-generalizing when speaking of such a mass of existing literature, there are two approaches which predominate when investigating driving. One stream is a qualitative one, mostly found in the social and cultural sciences, which utilizes an explicitly ethnographic methodology in order to understand how people relate to cars on a societal level. The other stream is a quantified one that often predominates within fields of engineering and behavioral studies and that

tends to take a more applied, and sometimes normative, angle and seeks to measure and/or alter specific driving behaviors. In this section we will look at some examples of such literature.

Qualified Driving

Within sociocultural fields of inquiry one tendency has been to focus on the vehicle itself as an element of material culture through which a much larger-scale process can be observed. One clear example of this is the collection of essays edited by anthropologist Daniel Miller (2001) in *Car Cultures*. These essays cover a wide ground of geographical territory in looking at everything from the significance of the car, and the freedom it facilitates, to African American car culture, to the intersection between religion and repair work for West African taxi drivers. Another work in this vein is ethnologist Tom O'Dell's (1997) *Culture Unbound* in which the American car is used as a key piece of empirical material through which to investigate and problematize the transnational cultural processes of Americanization in Sweden.

In many such studies, the car serves as a material focal point which both reflects and forms cultural identities. Of special interest in sociocultural studies of car cultures have been those cultures which exist somewhere on the margins of society and are viewed by the wider society they are a part of as being dangerous, unusual, and/or disadvantaged in some manner. A representative of this is Roger Brown's (2010) analysis of the documentation of the Oakland, California-based Falcon Boys Car Club undertaken by the filmmaker Brian Lilla. The Falcon Boys are a group of predominantly African American and Latino men residing in the economically-disadvantaged neighborhood of East Oakland who began in the 1970s to purchase unappreciated, low status, and inexpensive Ford Falcon automobiles and then to highly modify them with discarded parts in order to stand out in a way that projected an image of themselves and their class which they wished the world to see. In this case the interest is not about how the vehicles drive, but rather how they look and the messages they send to others.

In addition to reflecting values and status, cars are also capable of telling personal stories and transmitting culture as seen in Brenda Bright's (1998) study of the importance of lowriders and lowriding culture to Hispano/

Chicano culture in New Mexico. These vehicles, distinguished by painstaking modifications, detailed interiors, hydraulic pumps, and brightly colored paint jobs can represent a lifetime's worth of work and are made to tell a story about the individual who has made them. Ensuring that they stand out through both their design and in the manner of performatively driving them deliberately slowly presents a way of telling this story to others. However, while each lowrider is unique, the aesthetics reflected through them can be tied to expressions of a specific local culture, so that an urban Los Angeles lowrider presents a different Chicano aesthetic from that of a rural New Mexican one.

In a similar vein is H. F. Moorhouse's (1991) *Driving Ambitions: A Social Analysis of the American Hot Rod Enthusiasm*. Here we see the significant role that hot rod culture played in the lives of American post-Second World War urban youth who participated in, or aspired to participate in, the drag racing of specially modified street cars called "hot rods". In this work Moorhouse demonstrates the way in which participants, outside actors including professional racing car drivers and police, and popular culture represented by magazines such as *Hot Rod*, all contributed towards building a community around the hot rod.

Brown, Bright, and Moorhouse's works all provide compelling examples of the ways in which identities can be built around the car. In these examples the cars of the Falcon Boys, lowriders, and hot rods all provide a means of delineating boundaries and of identifying their individual owner as a part of a specific community which stands apart in some manner from wider society. However, the fact that these communities tend to view themselves, or to be viewed by others, as existing on the margins of society becomes problematic if one is attempting to understand driving in society at large.

And when research is centered on driving within those communities in which a vehicle does not necessarily play such a defining role in their own identity, the focus still tends to remain on what marks their cars or driving as unique or keeps them apart from others. Chris Lezotte (2012) chooses to investigate the impact of gender on cars by looking at the development of the concept of the "chick car". While "women's cars", that is those cars often deliberately marketed towards women and which are intended to

facilitate their expected role of being a mother, have long existed, the chick car is the antithesis of this. It is distinctly unsuited for mothering and is instead often marked as being small, sporty, and most importantly of all, fun. However, a car becoming marked by society as being a chick car immediately makes it undesirable, or at least problematic, for a male driver who values their sense of masculinity. And while car manufacturers have often struggled against embracing one of their vehicles being labelled as a chick car, ownership of such vehicles can very much come to provide a source of empowerment for the women who have them.

In those studies in which the gaze is broadened from specific segments of society to society at large the focus tends to relate in some manner towards mainstream consumer culture. Olle Hagman's (2010) study on the concept of "driving pleasure" in Swedish car culture is one example. Hagman argues that the idea of a car being pleasurable to drive has long been a key component of Swedish car advertising. However, while these ads focus on the performance of the vehicle involved, the drivers themselves are more likely to describe pleasure in terms of situational aspects of their drive. In this sense the enjoyment of the car for Hagman's informants is not how fast their car can go, but the way in which the car facilitates a sense of independence and freedom. Hagman also notes that Swedish portrayals of driving pleasure tend to be written by, and for, men. Indeed, of his own informants it was only several women who would say that they did not enjoy driving (ibid., p. 32).

Another common focal point of broad-level studies of the car is the manner in which the engineering and design of the vehicle has come to shape the ways in which society views the car as well as mobility through the car. The Dutch historian of technology Gijs Mom (2014), for example, chooses to look at the way the design of the family touring car in the West served to "close" the body and to control the senses. While early family cars tended to be open topped, leaving the occupants exposed to the environment the family was moving through, designs soon shifted towards the enclosed sedan which served to isolate the family from sensorial experiences external to the car. Mom argues that efforts towards what he calls "sound orchestration" permitted a refocusing from extraneous senses to what was regarded as the most desirable part of family car travel, namely

appreciating the view from outside the automobile. The observation is an important one, and we will come back to Mom and the topic of sensory insulation in early automobiles in the next chapter. However, a focus on a specific type of car still leaves open the question of how the everyday driving practices as a whole shift. Not everyone at the time wished to have a family touring car, and it might be expected that for many who did own one a family drive was still not the only, or even necessarily the primary, type of drive they embarked on.

In cases in which the focus of a sociocultural study of automobiles is not centered so much on the car as a material object in itself, the interest tends to be on the automobility permitted by the car and the ways in which this capacity for automobility, or lack thereof, changes and shapes culture. Unsurprisingly, the focus of such studies tends to be placed on those areas in which automobility is either most prevalent or perceived as most necessary, if not both. Ludek Broz and Joachim Otto Habeck (2015) chose to look at the phenomenon of the summer holiday trips that many residents of the Russian city of Novosibirsk take to the Altai Mountains. As outsiders, they found the phenomenon perplexing since the individuals who partake in the trips were traveling many hours to a location packed with people from the very city they had earlier departed from and were engaged largely in those activities which they could easily do back home. What Broz and Habeck (ibid.) come to argue is that in addition to fitting within a general post-Soviet valuation of cars and the freedom of movement, a key part of the participant's vacation was the journey itself. Being able to eat, chat with friends, listen to music, and watch the world go by all served as an important part of the overall experience and was, as they state, "situated in the same emotional geography as the destination" (p. 567). Studies such as this illustrate very well the ways in which driving becomes much more than just a means to get somewhere, and yet an unanswered point remains just how have the drivers come to feel so at ease in their vehicles that their drive can actually become more than just a singular focus on the road?

Other sociocultural studies focus on the interplay between automobility and urban design. Tim Creswell's (2006) work highlights the way in which American cities tend to be built and planned around the idea of

automobility as a given. He dramatically highlights the effects of this when investigating the disproportionate impact of Hurricane Katrina on the economically disadvantaged residents of New Orleans. While the existing evacuation plans established by the city took for granted that urban residents could flee by personal vehicle in the face of a severe weather event, the fact was that a great number of New Orleans residents were mobility poor as they were unable to afford to own their own vehicle, and consequently lacked the ability to flee the city and were therefore left behind to face the impact of the storm.

In addition to research on cars as material culture and on the mobility associated with them, there also exists a smaller body of research on the practice of driving. But again, this research is almost always centered upon quite specific segments of the population. This may take the form of the way in which distinct driving practices rather than a specific type of car delineate various automotive subcultures. Itai Vardi (2011) chooses to investigate the phenomenon of American demolition derbies. These are events in which an ordinarily negative event – the car crash – becomes a deliberate action for the purposes of entertainment. While the experience provides vicarious thrills and can be understood as a form of entertainment, Vardi argues that one can also draw out how the experience both reflects and affects the role of the car in society. In the case of the destruction derby the images of destruction serve as a catalyst for the value of production and viewing the crash as entertainment serves to contribute towards a sense of acceptance of the normalcy, and even light-heartedness, of a car accident. But while destruction derbies may have played a role in shaping American social attitudes towards cars and driving, they clearly still do not represent the everyday and mundane forms of driving that shape how society experiences driving.

In addition to studies on how driving practices can shape society, there are those studies which take the approach of looking at how perceptions of societies, or perceptions held by societies, shape driving practices. Katrina Debnam and Kenneth Beck (2011) chose to study the phenomenon of "driving while black" in Maryland, which is a term which describes the problem that African American drivers are more likely to be both pulled over and ticketed for traffic violations. By using a phone survey they found

that while African American drivers were more likely than white drivers to report a belief that they were being ticketed more often than other groups, they were also more likely to engage in what were labelled "risky driving behaviors" such as speeding more than 20 mph over the speed limit or using a phone while driving. While I would question qualitative insights derived from a study which does not utilize a methodology beyond telephone surveys, it is representative of the interest outside actors have in this sort of information as this particular study was supported by the Maryland Highway Safety Office.

Jenny Ingemarsdotter (2017) elects to look at what she calls "queer automobility", the way in which queer driving can be marked as something aside from a masculine or feminine binarity, by way of investigating Margareta Suber's 1932 Swedish novel *Charlie.* Ingemarsdotter argues that it provides a representative example of a car being operated in a manner which makes it "not only an *object* of desire, but as a *site* of desire – disturbingly charged with the promise/threat of losing control" (p. 39) as the protagonist attempts to win the heart of her love interest Sara. She contrasts this with the ideas of family and normalcy projected in Volvo automotive advertising, arguing that one can speak of both a "normal" and a "queer" way of driving which also reflects ways of being. Ingemarsdotter's work demonstrates the way in which driving is often a performative action and also an activity in which both the vehicle, as well as the manner in which it is operated, can lead to assumptions about the driver behind the wheel. But is performative driving the same thing as everyday driving? I would argue that often it is not, and that a focus on fiction and advertising limits yet again how much can be said about the experience of everyday driving.

Ethnographic research has also illustrated how societal perceptions of gender can shape the values associated with driving. This can be seen, for example, in Eyerman and Löfgren's (1995) study of the genre of American road movies. These movies almost inevitably associate the freedom and romance of the road with white men and their vehicles. The freedom they are afforded is often one to both escape from some form of despair or discontent in their life as well as to drive towards a hope of something better. Eyerman and Löfgren also observe that this theme holds echoes of the idealized experiences of the pioneer men of the 19th-century Western

migrations. In many of these movies, women are consigned to a supporting role of "the motherly or cynical waitress at the roadside diner, the damsel in distress or the seductive hitchhiker" (p. 65). The road itself becomes both a symbol of virility as well as a test of manhood. They observe that turning this concept on its head is part of the appeal of the film *Thelma and Louise*; one of the few female-centered road movies. In grabbing the wheel they are also "grabbing a set of male symbols and entering forbidden territory" (ibid., p. 78).

Along the same lines is the study *Women on the road: Regendering Narratives of Mobility* by the Swedish scholar Jessica Enevold (2003). In this book, Enevold argues that popular Western culture has historically marginalized women in travel literature by portraying the road trip as a distinctly male right-of-passage. She contrasts this with some examples of the portrayal of women on the road in the late twentieth century, notably by also writing on the movie *Thelma & Louise*, in which she sees the female protagonists as having challenged this masculine-centered approach to depicting mobility by appropriating a space on the road for themselves in which they need not be merely objects of desire for men nor passive subjects who must stay off the road. Enevold ultimately argues that such depictions hold value for a feminist politics in that the freedom of physical mobility is both of special value and a human right.

Of course, this doesn't mean that an idealization of freedom through the road is uniquely American. Encounters with ideals of both freedom and gender in driving are also met in the ethnologist Eddy Nehls' (2003) study of professional truck drivers in Sweden. Nehls' interest was in seeking to understand why the Swedish truck driving profession is so male dominated and what possibilities there might be for a change in this dominance. In doing so he observes that freedom was experienced as a way of life for the drivers. In addition to being able to choose routes and stops, so long as their cargo was delivered on time, this idea of freedom also encompassed a dream of being able to own and hold responsibility over their own truck. These ideals of freedom, independence, and competency – already seen as components of idealized masculinity – reinforce the male-dominance of truckers as the employers themselves are predisposed towards hiring polite, working class, ethnic Swedish men. While the world of everyday driving

is certainly less male-dominated than the world of long-haul truckers, Nehls' work still shows the way in which conceptions of masculinity can become attached to and expressed through vehicles.

Other literature also exists which seeks to illustrate how the operation of a car can permit the fulfillment of an aspiration towards an expected or desired value. Aaron Bonsall's (2015) study of the role of the automobile for fathers with disabled children highlights the role that driving plays in enabling fathers to feel that they are practicing "good fathering". Firstly, the confined nature of the car permits an opportunity for communication and negotiation with the children. Secondly, they can arrange objects within the car as a way of turning the drive into an opportunity for their child to feel safe and comfortable. And thirdly, transporting their child to school and other activities enabled the fathers to feel that they were fulfilling a responsibility towards their child. For these fathers, driving presented an opportunity to serve as a "good" father while still balancing the other responsibilities they might have during their day, such as commuting to work. While a study such as this is much more in line with what for many of my informants would be an everyday sort of drive, it still leaves questions unanswered for the purposes of this thesis. What is it about the car that permits it to be an especially good site for fathering? Is there more to feeling safe and comfortable inside the car than just being behind metal and glass?

We can draw from this existing body of qualitative research several important points. Clearly, the car is a significant element of material culture. It is one which can form identities, both voluntarily as well as being imposed by others, based around both what one drives and how one drives it. The car also possesses a potent symbolism. This is evident in the sub-communities which have formed around various automobiles but also in the way in which cars are marketed and perceived by society at large, such as being facilitators of ideals such as independence and freedom. And this symbolism can in turn both shape and be shaped by the ways in which specific vehicles are understood, such as in the creation of the family touring car, or the concept of a "chick" car.

And, furthermore, the mobility afforded by the car is highly significant. This is perhaps most easily seen in the way society and the built environment can revolve around the vehicle, sometimes excessively so as in Creswell's

(2006) example of the City of New Orleans before Hurricane Katrina. But this mobility also opens a range of performative possibilities through driving, such as Bonsall's (2015) example of driving being utilized to help in producing a "good" father.

A problem with much of this research, for the purposes of this study, is that driving, as a concept, is still in some sense taken for granted. While the car and what it can represent both as a material object and through the way it is operated may be illuminated, any sort of explanation of what driving itself might be is often not given. If we want to look at some of the micro-practices involved in driving, we often must turn towards an existing body of quantitative research.

Quantified Driving

A second, and quite prolific, stream of research exists which seeks to investigate driving, or the experience of driving, as a quantifiable thing. A great deal of this research exists within cognitive-centered academic disciplines. While some of these studies incorporate some type of ethnographic methodology, much of it utilizes methodologies and equipment from the STEM (Science, Technology, Engineering, and Mathematics) fields. Often, the purpose of this research is to provide a means of predicting how drivers might react to certain encountered situations, how experiences with a car or its driving behavior is reported by drivers, or to investigate the probability of some desired, or undesired, outcome. This is also to say that this research often possesses a specific focus on its applicability towards the engineering and design of cars or the larger systems which they are a part of.

One common form this research takes is to attempt to measure how variables such as age or gender affect driving behavior, especially how an individual is likely to relate to the technology present in their vehicle when faced with specific, commonly encountered driving situations. One such example of this type of study is the work of Kircher, Larsson, and Hultgren (2014) in utilizing data collected from research participants who had experienced a set of different driving conditions in order to see how trust in technology affects tactical driving behaviors. In conducting the study,

they placed participants behind the wheel of a simulator that was set to simulate manual driving, intentional car following, adaptive cruise control, and a combination of adaptive cruise control with adaptive steering. While the informants were on their simulated drive the researchers would track driving performance as well as driver gaze behavior through the tracking of eye movement. At the conclusion of the drive, participants would be given a questionnaire in order to measure the driver's sense of trust in the technologies they utilized. Through this they found both that drivers reported a generally high level of trust in automated systems and that the drivers would make informed choices as to when to let the automation handle a given driving scenario and when they felt they needed to take over manual control. But the study does not answer why this is so. The research participants serve as data points and it is not clear what backgrounds and experiences they brought to the study as drivers, nor did it appear that they were interviewed after their drive. Would they behave and feel the same way in an actual autonomous car? And what did they feel automated driving afforded them?

Another example is Montgomery, Kusano, and Gabler's (2014) investigation into what differences might exist in braking behavior between different demographic groups. For this study they collected data over the course of a year on a driver's braking behavior by way of the time to collision at which they began braking. Analyzing this data through the variables of age and gender they found a statistically significant difference in that older and/or female drivers were more likely to brake sooner than younger and/or male drivers. The authors then speculate that perhaps this is connected to factors such as gender differences in how risk is assessed, or age differences based on increased driving experience or a fear of age-related decline of driving ability among older drivers. Their idea is that this quantified data can then be utilized by designers of forward control avoidance systems to shape collision warning alerts in order to prevent drivers from turning the feature off in annoyance at the perceived overly frequent alarms. While a focused quantitative study such as this can provide useful data for how brakes are being deployed by drivers, it cannot tell us much about driving in and of itself. Firstly, it still leaves open the question of why certain demographics might brake differently. But even

more fundamentally it is highly limited in how much it can say towards a holistic understanding of driving in that there is a great deal more to performing and experiencing driving than just braking.

In other cases, the studies are focused more on predicting the likelihood of a desired or undesired behavior occurring than on how individuals react to presented driving situations (e.g. Razmara, Aghamolaei, Madani, Hosseini, & Zare, 2018 and Lazdins & Martinsone, 2018). Often, this is research that is centered on how "safe" driving behaviors may be promoted or "unsafe" behaviors dissuaded. Bendak and Al-Saleh (2013) utilize surveys of drivers in the United Arab Emirates to collect data and then also seek to analyze the data through variables such as age and gender in order to determine the likelihood of a particular group to wear a seatbelt. In doing so they found that overall, only 61% of drivers and 43.4% of front seat passengers, would wear a seatbelt with the rates being lower for those drivers who are younger or male. They then further observe that a significant number of informants also reported being both insufficiently educated in the importance of seat belts and were unlikely to take the penalties for not wearing a seatbelt in the Emirates seriously. This analysis is used to argue that the Emirati government should reform their seat belt policies in order to decrease an automotive death rate which is claimed to be one of the highest in the region. But again, while this study produces data on which demographic groups are more or less likely to self-report something such as seat belt use, it does not seek to speak to the informants as to why they do or do not feel comfortable using a seat belt. And if they do not use one, how is it they have become so comfortable with driving that the risk to their life feels sufficiently minimal in the face of a high general accident rate?

In addition to measuring rates of frequency of a given driving behavior, surveys are also commonly used in this type of research in order to attempt to quantify the frequency or severity of an experience. Smart, Stoduto, Mann, and Adlaf (2004) chose to utilize surveys in order to understand the prevalence of road rage in Ontario, Canada. Moving beyond the variables of gender and age, they also wished to connect amount of driving exposure and vehicular factors to the prevalence of road rage. While finding no significance in the type of vehicle being driven, they do argue

through a regression analysis that there is incrementally more road rage reported by drivers when their number of weekly kilometers driven is increased, as well as whether they drive predominantly on urban roads or not. Using this information, they speculate that the cause of their findings may be a combination of the more stress-inducing pace of life in the city with frustration at being prevented from driving a vehicle how one wishes on a crowded urban Ontario road.

Alternatively, the studies may seek to use quantified data to measure or predict expected attitudes towards cars and driving. A recent study by Geldmacher, Just, Kirschner, Buchmüller, and Marquardt (2017) seeks to measure the effect that access to information has on the acceptance level of self-driving cars in Germany. For their methodology they chose to use Google Trends to see when interest in news articles pertaining to self-driving cars peaked. They then classified these articles as presenting either a positive connotation, such as the presentation of a new self-driving car at a consumer electronics show, or a negative connotation, such as a Tesla car crashing while operating with self-driving technology. Lastly, the date of these articles was used to analyze the stock market performance of the companies mentioned in the articles and whether these stocks raised or lowered as expected based on the positive or negative connotation Geldmacher et al. assigned to the news. Believing that such a correlation exists, they argue that information and knowledge are interrelated and necessary for acceptance. However again, as in most other quantified studies, there is no attempt to understand the wider experiences of drivers and consumers, or in this case even to speak to them directly. A significant problem with studies of this nature, if one seeks to explore driving as practiced and experienced, is the distance between what is being analyzed and the driver on the road. That is to say that while media trends and stock market performances may say something about how investors, developers, and promoters perceive, portray, and react to autonomous drive news this is not the same thing as understanding how a driver behind the wheel is understanding and experiencing their vehicle or drive.

Particularly within research disciplines involved in industrial design, quantifiable data can also be used as a means of attempting to provide actionable information about the driver experience of concepts which

might otherwise be difficult to quantify – such as comfort or convenience. A representative example of such a study is that of Coelho and Dahlman (2012) who sought to evaluate the effect that upper seat articulation, that is to say seats which permit an angle adjustment of the upper portion of the seat, has on the perception of comfort among drivers of differing heights. Drivers were placed in both reference and articulated seats and asked to present subjective evaluations of their comfort and preferences. Using these evaluations, they deduced that while shorter drivers tended to prefer seat articulation, taller drivers were generally comfortable in both standard and articulated car seats. These findings are then used to argue that seat articulation can be utilized to design backrests of greater perceived comfort than that of the current seating on a standard car.

While such design studies are useful for what they aim to do, such as to inform which factors to consider in designing a more comfortable car seat, they do not necessarily reveal much about how a driver comes to feel comfortable, or to experience comfort, within their car if we take comfort to mean more than just physical sensation. A driver in a very comfortable seat is still not going to feel comfortable about being in a car if they are frightened to drive it. Nor does it say much about how feeling comfortable or uncomfortable in a seat might in turn affect the way in which someone drives. Research that is more immediately in line with understanding how individuals drive can be found within the discipline of human factors research which seeks to investigate the interaction between humans and systems.

While sometimes in studies of the car this research takes a physiological interest, such as the aforementioned study on seat articulation, at other times it seeks to utilize psychological principles to understand driving behaviors. One such concept that several studies have worked with is that of "mind wandering", a concept linked to the idea of "distracted driving" but in this case driving that is distracted not because of the performance of other tasks but because of the driver has become "lost in thought" or is daydreaming. He, Becic, Lee, and McCarley (2011) sought to investigate the association of mind wandering with an increased risk of crash involvement. Placing informants in a driving simulator they then recorded when drivers self-reported finding themselves mind wandering. Their finding was that mind wandering resulted in a loss of driving performance

in the sense that while vehicle control was generally maintained, visual attention tended to narrow into a sort of tunnel-vision of the road ahead making the informants more likely to become involved in a crash.

Albert et al. (2018) also seek to use human factors research to investigate mind wandering as a way of predicting risky driving behavior in young Canadian men. The propensity for a subject to mind wander was measured by their performance in the Sustained Attention to Response Task (SART) test which provides a means to measure lapses of attention while engaged in a task of pressing specified number keys on a keypad , as well as the Day Dream Frequency Scale (DDFS) which asks participants to use a 5-point scale to describe when and where they daydream. They found that while the behavioral measuring SART test could predict a certain variable associated with risky driving - mean vertical gaze, which could mean less observation of the speedometer or the road - the DDFS test could not, which they speculate could reflect a tendency for people who think they daydream a lot to more easily catch themselves doing it. The authors argue that their study reinforces the need to look at what links exist between mind wandering and risky driving behavior. Later, in Chapter 4 of this thesis, we'll come back to this idea of "mind wandering" on a drive.

These examples illustrate two of the predominant focuses one encounters through existing quantitatively focused studies on the car: research on isolated and/or particular driving behaviors and collecting quantifiable data on physical or cognitive experiences of driving. When this research is centered on a particular driving behavior, it tends to take a quite narrow focus by investigating how a particular driving situation, or piece of technology, is utilized by a generally specified demographic group(s). A small set of defined variables may be considered in the study, but a holistic approach is not taken. Sometimes the objective of this research is to understand how people are utilizing a piece of technology, while other times the focus is more on establishing behavioral predictions, sometimes with the further goal of suggesting how to manipulate behavior towards a desired outcome; such as decreasing the frequency of distracted driving.

The second stream, particularly found within design and related fields, seeks to understand how, or at least whether, something might be viewed as possessing a certain quality such as comfort. This again almost always

takes a very specific focus of research, as in the example of reported comfort in a seat through the presence of upper seat articulation. Other times the attempt is to quantify a cognitive experience behind driving, such as the examples provided previously of when people are likely to experience road rage or whether a given population appears to be accepting of autonomous-drive technology. While such research is often suitable for its defined purpose, it does not necessarily further a broader understanding of what such a value might mean when it comes to driving.

Much of this research is useful, especially when applied to specific applied problems in design and engineering. It also presents one way through which to investigate driving practices themselves and is often more interested in investigating everyday drives and driving situations rather than those on the margins. But the lack of a holistic approach, and the focus on quantifiable data rather than qualitative experience, means that the language utilized is often highly divorced from the way that drivers themselves would explain a drive, and the values and experiences which they form around driving, which makes it impossible to understand why certain behaviors or attitudes might exist. An individual could perform well in an adaptive cruise control simulator only to elect not to actually drive in, or at least purchase, a car with such technology in real life and within the limitations of a study only interested in simulator performance there would likely be no illumination as to why this is. This is where an ethnological approach of working in depth with informants and seeking to understand how they personally experience a drive can contribute.

An Emerging Space Between

As we have seen there is a wide range of existing studies of the car and driving, both located in or drawing from sociocultural and/or qualitative approaches, as well as those from a STEM and/or quantitative approach. While existing qualitative research does much to show the importance both of the car as an element of material culture, and the changes to society it may bring, as well as the ways in which driving behavior can be shaped by cultural identities, it rarely touches directly on the automatization of driving practices. And, in the frequent focus on sub-cultures, which often

stand out from the norm and exist on the margins of society, they may limit how much they can illuminate about the routinized, everyday, and mundane driving which occurs all around us.

On the other hand much of the quantitative driving research also tends to present a narrow focus on particular aspects of the car or driving, be it the propensity for certain risky behaviors, the level of comfort a particular object in the vehicle provides, or the manner in which people react to specific driving situations – although the topics chosen are often more grounded in everyday driving. Many of these types of studies lack a wider context or perspective over the phenomenon being investigated. Often the cultural context is ignored completely – a major weakness for the purposes of this study since driving does not take place in a vacuum but rather is a part of wider society. Furthermore, a given behavior which may be associated statistically with unsafe driving may not necessarily be perceived as such by the drivers who live the experience. The consequence of this is that attempts to intervene that do not account for experiences, perceptions, or values may be ineffectual and/or poorly received by drivers as we shall see later in this work.

But more fundamentally, research streams of both these sorts tend to possess the same gap for the purposes of this study. Namely, the tendency to take for granted what driving is. The concept is rarely explored and while one can observe how certain individuals drive in particular ways, this does not necessarily present a way of understanding what it is to drive. Put another way, the existing qualitative research tends to ignore the drive, while the existing quantitative research tends to ignore the driver in the sense of exploring why they drive, what experiences they bring to their drive, and how these factors might affect the manner in which they drive.

Even within those fields of research in which driving might take a special interest there is often some key element missing. Within mobilities research, for instance, Andrew Dawson (2017) has identified and critiqued the common tendency to view driving as sensually disengaged. He argues that while normally senses are perceived as operating web-like in conjunction with one another, mobilities researchers tend to write as though they believe the car breaks up such a network and the senses become disengaged both from one another as well as from the wider world

through a cocooning effect brought on by the materiality of the car. He attributes this in large part to the classical Marxist influence on many mobilities researchers in which alienation serves as a key analytical concept that comes to take the form of the car bringing about a sensory disengagement. Dawson insists, and I agree, that to the contrary driving is heavily shaped by a sensory engagement rather than disengagement through the car, and this point will be encountered again within the analytical chapters.

There is, however, a growing field of researchers from multiple disciplines who are interested in the cultural aspect of driving without at the same time neglecting the technology of the car as a material object. Most often this research is connected to emerging self-driving technology and is very often of an applied nature. One example of such research is the work conducted by the human-computer interaction researcher Barry Brown (2017) on the social nature of driving and the implications this has for the development of autonomous cars. Utilizing publicly available YouTube videos of dash-cam footage from vehicles with self-driving abilities Brown seeks to identify challenges in getting autonomous cars to fit in with the social life of the road. One notable empirical example presented is that of a Tesla car in an autonomous driving mode which fails to identify or properly respond to polite driving behavior from other drivers. The Tesla owner signals his intention to move into a passing lane and the human-controlled vehicle behind the driver kindly slows to allow the lane-change. However, the Tesla's system fails to recognize this polite gesture and instead decides to make the lane change after the human-controlled vehicle has given up waiting and already begun to accelerate, causing the Tesla owner to appear rude twice over against their will. Brown uses this, and similar examples, to point out the danger in neglecting how humans drive when attempting to establish self-driving behaviors for the car.

Another example of recent research in this vein from Sweden is the work being conducted through the Human Expectation and Experience of Autonomous Driving (HEAD) collaborative project between Halmstad University and Volvo Cars. Several recent publications from this research group emphasize the need to understand mobilities and emergent technology within their lived everyday context (e.g. Pink, Fors, & Glöss

2018 & 2019 and Pink, Fors, & Lindgren 2018). For example, by riding along with Swedish commuters who utilize apps and other features on their smart phones they show how individual drivers can configure both their phone and car into a mobile present which suits their life. They use this observation in order to argue that developers of new automated technologies should bear in mind that there is a point at which automated technologies and their associated images meet both day-to-day life and the improvisation of users who find their own sometimes unanticipated ways to incorporate the technology.

And outside of the academy one can find researchers, such as those associated with the Human Centered Systems practice at the Nissan Research Center in the United States headed by anthropologist Melissa Cefkin, who are also interested in the cultural aspects of automated driving technologies. Such research into automation in driving has already included investigations into the way in which conceptions of personal autonomy and sociality are both facilitated and subverted by simulated self-driving cars (e.g. Stayton, Cefkin, & Zhang, 2017).

This thesis seeks to support and contribute towards this growing body of literature which looks to understand driving as both a cultural and technological phenomenon in which each shape the other. As such, in trying to understand how driving might already be experienced as automatized it regards driving behavior and micro-practices as important, as well as the cultural context in which the car and driver operate in. My own focus to this contribution is a look specifically on the automation of everyday driving at present rather than that which occurs specifically through self-driving or other emergent and emerging technologies.

Positioning

As a dissertation in ethnology, this work remains grounded, both theoretically and methodologically, within a cultural analytical approach. Furthermore, it can also be seen as drawing upon, as well as being placed within, two particular research trajectories within cultural analytical research. One is the large and ever-expanding field of practice-centered studies. Practice studies have now been conducted across a range of topics

and disciplines ranging from, but certainly not limited to, management and organizational studies (e.g. Feldman & Worline, 2016 and Goldkuhl, 2006) to consumption culture and retailing (e.g. Shove & Pantzar, 2005 and Fuentes, 2011). While practice-centered studies might not necessarily share a common methodology, or even a common theoretical outlook, they do all seek, as this study does, to treat practice as a "central conceptual unit of enquiry" (Shove, 2017, para. 2). And, in this sense, "usage of the term 'practice' presupposes a question of the relationship between practice and structure" (Ortner, 1989, p. 194). This relationship is two-way in that social structure influences and shapes human action, while action in turn influences and shapes social structure (Giddens, 1984). Practice-based studies in this sense can provide a means through which micro-practices can be contextualized.

A second research stream that this thesis is a part of is that of the field of mobilities research. Present sociocultural understandings within the topic of mobilities can be seen as being guided by a "mobilities paradigm" which emerged, arguably, sometime in the early to mid-2000s, particularly through the work of Sheller and Urry (2006), Cresswell (2006) and the academic journal *Mobilities.* This paradigm encapsulates a field of research centered on "both the large-scale movements of people, objects, capital and information across the world, as well as the more local processes of daily transportation, movement through public space and the travel of material things within everyday life" (Hannam, Sheller, & Urry, 2006, p. 1). For Creswell (2006) "if movement is the dynamic equivalent of location then mobility is the dynamic equivalent of place. Place [...] has come to signify meaningful segments of space – locations imbued with meaning and power" (p. 3).

Mobilities researchers also challenge a historical tendency to conduct "static" research in what is a very dynamic world. Work within this field of inquiry has also led to a prolific and broad base of research which has ranged between problematizations of the concept of automobility (see Böhm, Jones, Land, and Paterson, 2006), to studies of homeland visits of second-generation ethnic Albanians (see Vathi & King, 2011), to the ways in which shipping containers shape, and are shaped by, American transport infrastructure (see Heins, 2014). However, in addition to demonstrating

how the world is shaped by movement the field of mobilities research also presents a means to illustrate the way in which mobility, and systems of mobilities, both shape and are shaped by movement. This movement even includes forms which might be perceived as routine and/or mundane, such as the daily commute. For example, David Bissell (2016) in analyzing an evening train commute in Australia, shows how even fleeting encounters, such as a heated verbal altercation between passengers, can provide a transformative experience that is not necessarily related to macro processes of institutional control but rather is a product of the commute itself. As he argues, "what this ultimately means is that mobility systems are actively changing people, rather than just passively transporting them" (p. 395).

On a final note, it is also important to recognize that in many cases, including this work, the field as such extends beyond the "academic bubble" and encapsulates and incorporates, though ideally not uncritically, the topical concerns and framings of the world outside academia. Cars, automotive technologies, and driving are all common centerpieces of works of journalism, advertising, public or private policy, and popular culture. While this study freely draws upon such sources for both knowledge and empirical material, it is also recognized that these same fields could well draw upon a study such as this in order to further their own objectives if they so wished.

Theoretical Concepts

Practice

Driving, as an action in itself, is in many ways an ideal topic to investigate from a practice-based theoretical approach, especially if one accepts the argument that non-human objects have a profound role to play in the reproduction of social order (Shove, Watson, Hand, & Ingram, 2007). The difficulty in separating the material and the social from practice becomes quite explicit indeed when it comes to the act of driving. Without a car, driving is not going to occur. At the same time, to operate a vehicle in complete ignorance of social regulations, cultural understandings, and

knowledge would likely make for a rather short and violent trip. The practice of driving arises, as other practices do, through this blending of the social and the material in the sense that it occurs as a materially mediated activity (Schatzki, 2001, p. 25).

Until relatively recently, however, the significance of material objects to practice tended to be underrepresented, or at any rate was rarely the focus of the studies themselves. Early proponents of establishing a basis for a practice-based approach to viewing phenomena, such as Anthony Giddens (1984), tended to direct their attention more towards looking at the structuring and repetition of everyday practices. In doing so Giddens sought to bridge what he perceived to be a problematic division between the macro and the micro (Smith & Riley, 2009, pp. 136-137). Instead of viewing individuals as passively receiving external structures he sought to illustrate that structure is created through the reflexive actions of everyday life. This is to say that phenomena which can be spoken of and recognized as practices become such through a continual and routinized reproduction of a set of actions (Southerton, 2012, p. 339). However, while practices are a central unit of analysis in Giddens work the materiality surrounding these practices is not.

This significant omission of materiality was not missed by one strand of practice scholars who have come to strenuously argue that practices should not be understood without a consideration of those material objects which practices are both performed with and through (e.g. Schatzki, 1996 and Reckwitz, 2002). This call to materialize practice in the social sciences is one that has been taken up by the collaborative work of Elizabeth Shove and Mika Pantzar (e.g. Shove & Pantzar, 2005), among others, who have sought to form a more holistic understanding of what comprises a given practice.

Reckwitz (2002) argues that "carrying out a practice very often means using particular things in a certain way. It might sound trivial to stress that in order to play football we need a ball and goals as indispensable 'resources'" (p. 253) before then pointing out how non-trivial it has been for media scholars to recognize and show how print and electronic media influence social practice. As previously mentioned, these materialized practice theorists argue that the initial wave of practice theorists had an unfortunate tendency to ignore or underappreciate the materiality around their given

topics of research. Giddens, for example, came to treat materiality as something which individuals impose their own agency upon rather than as something which itself acts upon and shapes the individual (Pinch, 2008, p. 463). As a corrective to this shortcoming, a materialized practice theory involves viewing a practice as being composed of material, meaning, and competence alike (Shove, Pantzar, & Watson, 2012, pp. 22-25).

It should be noted that the significance placed on investigating how materiality shapes practices is not by any means unique to those who would explicitly say they are engaging with practice theory. In this aspect practice theory shares many similarities with the Actor-Network Theory approach propounded by Callon (1986) and Latour (1987) among others. A key point of difference, however, is the tendency for practice theorists to still retain the human as the focal point of research and not to assign principles such as agency or intent to non-human actors (Schatzki, 2001, p. 25). It should be noted that this does not in itself mean that it would not be potentially fruitful to conduct a study on driving utilizing an Actor-Network Theory approach. In the case of this particular study my decision not to do so was largely based on a concern that by supposing an equal agency to all components of a "network of driving" I would need to place more emphasis on automotive technology when, as I have argued earlier, there is already a tendency within a large body of research into automation in driving to focus on this instead of the driver.

So how are we to understand the concept of a practice? Shove and Pantzar (2007) argue, borrowing from Schatzki (2001), that practices exist as "sets of norms, conventions, ways of doing, know-how, and requisite material ways" (p. 155) or, in condensed form, to a tripartite of materials, skills, and images/values. These three components are, crucially, to be viewed as being in a constant dynamic relationship with one another. This point can be understood both in the sense that they should not be seen as operating in isolation of one another but additionally that they each possess a capacity in themselves to create, stabilize, or even destroy a given practice (Shove & Pantzar, 2005).

I would argue that driving, when understood as a practice, is no different in the sense that it, too, is constructed by way of the same dynamics shown in other materialized practice-based studies. One could make an argument,

for example, that the equipment and formal rules of driving are at least roughly similar for all drivers. A car is, after all, in a broad sense a car. The model and its layout may vary to a greater or lesser extent, but the process of driving remains relatively similar in concept. And once on the road everyone is, at least formally, playing by the same set of official and codified rules via speed limits, stop signs, right of way laws and other enforced legal regulations.

And the practices of driving, like many other everyday practices, can often be ordered. The concept of the ordering of practices is simply that some practices are pre-requisites for others. At the same time, this opening up of new practices can exclude the possibility for other practices to take place (Hand & Shove, 2007). For example, in the case of driving this could be reflected on a day-to-day level through the way that employing a GPS device may then mean being prepared to follow audio cues, a turning down of the radio to hear said cues, and a perceived freedom to avoid reflecting upon the route taken to the destination. But this ordering of practices can also be reflected through changes to driving over time, such as in the sequential micro-practices drivers once learned to safely crank start an engine in early automobiles, which later became obsolete and forgotten with the introduction of electric starter motor systems.

Also, the way in which people experience and describe driving can vary quite considerably from situation to situation. And these variations can exist not only between drivers but even within the same driver to the extent that it is probably more accurate to speak of *drivings* than any sort of singular monolithic conception of driving. Every individual will experience driving in their own manner and with their own dispositions so that even for the same driver there are a range of different ways in which to drive. Driving a very sick child to the emergency room is not the same drive as driving a child to an afterschool football practice. A road trip with friends is not the same drive as a commute to the office. A trip down an unpaved country lane is not the same experience as a trip down a suburban mega highway, and so forth.

To utilize a practice theory-based approach does not in itself, however, rigidly shape the methodology that will be employed. This is to say that practice theory may not necessarily provide a set research methodology,

but rather a means through which to frame questions and problematize material which might well call for different methodologies from one study to the next (Shove, 2017, para. 22). The methods specifically utilized in this study will be discussed later in this chapter.

The value of drawing upon a practice-centered analysis to a study of driving is that in order to make sense of driving, it is important to make some sense of the actions that comprise the practice of what we call driving. To ignore the micro-practices which make up driving is to fall into the aforementioned trap of viewing driving as an overly monolithic thing. We will see later that when we speak of driving we are actually speaking of an ostensibly demanding range of actions that must be performed, and information which must be successfully managed, on a continuous and multi-tasked basis in order to get us to where we're going smoothly.

Perception

Of course, driving is more than just an action performed. It is also an activity that is consciously experienced. And for that matter often experienced in ways which can be rather unique to the car. As Edward Hall (1982) notes, even familiar landscapes can take on a completely different look and feel at the speed a car affords versus moving through the world on foot (p. 176).

Although perception as a concept can be understood in a range of different manners across different disciplines, it has, within cultural analytical research, perhaps been most frequently investigated through, or at least influenced by, the theoretical lens provided by phenomenology. Phenomenologists have utilized various iterations of phenomenological theory to investigate everything from a runner's description of the experience of having a "runner's high" (Whitehead, 2016) to how students experience interactions with their university president (Schuemann, 2014).

To take a phenomenological approach to perception is, broadly put, to "study the structures of consciousness as experienced from the first-person point of view" (Smith, 2013, p. 1). Drawing, classically, on the theoretical work of scholars such as Heidegger, Husserl, and Merleau-Ponty, among others, it often involves asking the sorts of questions to informants or

empirical material that are not generally asked in day-to-day life (Smith & Riley, 2009, p. 62). An example could be asking an informant to, in a very open-ended way, explain how boredom actually feels or what their reaction was to an encounter with a given experience. In doing so it seeks to study the structure of a range of experiences which may include thought, imagination, desire, and embodied action among others (Smith, 2013).

One benefit to the employment of a phenomenological approach to the investigation of driving is its ability to provide an effective means by which to make the familiar a bit more unfamiliar. For instance, one challenge in investigating driving is that, for nearly any researcher or informant alike, driving is ostensibly an easily comprehended activity at first sight. Even if one is not a practiced driver the concept of driving is still familiar via the experience of being the passenger of someone who is. A phenomenological approach to a topic can also, ideally, provide one means to distinguish a researcher's own assumptions and expectations by way of focusing on those of the informant (Smith & Riley, 2009, p. 63).

It is worth noting, however, Merleau-Ponty's (2012) argument that perception and the body cannot and should not be separated in a Cartesian sense. That is to say that experiences are filtered through bodily sensations of sight, sound, touch and so forth. This idea of lived perception stands in opposition to an idea of stimuli being passively received by an individual. Rather, one can only make sense of experiences via an orientation to the body. This explains, among other things, how one might come to be able to perceive the appearance, or at least the form, of an object even when it cannot be seen. Merleau-Ponty further argues that this inability for perceiving without the body creates a sense of ambiguity in that a wide range of behavior that may hold meaning to an individual cannot be articulated because it is not deliberately reflected upon. Just how widespread this phenomenon is when it comes to driving will be seen later in the analytical chapters of this thesis.

For my research phenomenology provides a useful means to analyze driving at the point at which a practice-centered approach might leave off. While driving consists of a range of micro-practices, these practices are generally unremarked upon and difficult not only to articulate but even to notice for a driver. Delving deeper into the perception of driving and its

associated sensations provides a means of illuminating the experience of driving which has been created by this linking together of practices. But to understand how this process can become experienced as automatic I utilize a third key concept in this thesis: embodiment.

Embodiment

Driving is much more than simply a cognitively experienced activity. It is also, fundamentally, a felt activity in which our bodies mediate our experiences and perceptions (Shilling, 2003, p. 20). While there have historically been many treatments of the body in symbolic or discursive studies it is only relatively recently that attention has begun to shift towards a focus on the body as a physical, dynamic, moving instrument in its own right (Griffen, 2007, p. 7).

Experiencing the world involves considerably more than just what we can see. It is something which involves all of our senses and the entire body as an organism (Ingold, 2011). In driving this is true not only for the five classic senses but also for those such as proprioception which enables us to perform driving tasks while keeping our vision on the road. Indeed, we often come to know a drive through our bodies and what feels right or wrong before we have been able to make sense of it cognitively. Occasionally this can even be extended to a proprioceptive treatment of the car itself as a bodily extension, such as when someone speaks of attempting to ascertain whether "I" can "fit myself" into a tight parking space. A kinesthetic sense experienced through the car also allows drivers to "feel the road" and to gauge how a trip is progressing and whether more or less attention should be paid to the driving micro-practices.

In addition, it is worth noting that these senses are also, at all times, being materially mediated. At no point can the drive be experienced as separated from the materiality of the car itself. For instance, the road is felt through the connections of our torso to the car's seat and our hands on the wheel. Sounds of the world external to the car are heard only after first moving through the insulation afforded by the vehicle's body and windows and whatever engine noise, or music through the sound system, is being generated. Heating and air conditioning systems, as well as a greenhouse

effect from the glass or thermal conduction via metal instruments, affect how weather is experienced, and so forth. It is simply not possible to treat sense and materiality in a separated manner here.

One helpful way of thinking about the sensorial aspects of driving, with both theoretical and methodological significance, is to borrow from Sarah Pink's (2009) concept of sensory ethnography. This is, she stresses, not a data collection method in itself but instead is a call "to rethink both established and new participatory and collaborative ethnographic research techniques in terms of sensory perception, categories, meanings and values, ways of knowing and practices. It involves the researcher self-consciously and reflexively attending to the senses throughout the research process" (p. 10). A key point for Pink is to treat the senses as interconnected and not moving along separate channels of experience. It also involves not just abstracting senses but actively seeking to both invoke and jointly experience them with research participants. Pink's (ibid.) argument for the utility, and indeed need, for such methodologies is that as sensorial experience is central to the ethnographic encounter, it is necessary to make a point to account for the senses in a work of ethnographic research.

Nor should embodied sensations be viewed as merely providing external stimuli to be dispassionately processed through cognition. Driving is, quite routinely, an emotional activity in both a positive and a negative sense. The kick of acceleration in a high-powered sports car may, for one driver, evoke smiles and laughter. Yet, another driver, in a situation of being pushed forward against the seatbelt in a moment of hard braking to avoid hitting a car which has cut them off, can experience a very intense, and often performative, rage. And emotions are not merely experienced but in themselves have the power to "do" and to generate meaning (Ahmed, 2004). The significance of this is that emotions are not simply states of mind but are cultural practices in and of themselves which possess a power to shape rhetoric and relationships on both a micro and macro level. Indeed, specific practices often rest upon these embodied experiences at an implicit level. But this implicitness does not deny emotion the considerable power to shape practice and experience, for instance in an example of the sense of panic, and immediate search for a place to pull off the road, as soon as a driver might smell smoke in their vehicle.

This is because, as Sara Ahmed (ibid.) argues "emotion and sensation cannot be easily separated" (p. 6). It is through contact with an object that one may determine whether it causes one to feel something positive or negative. Rather than these emotions being inherent to the object, they are often perceived as the cause of them outright. Ahmed further argues that the impression an object makes upon us is shaped not only by the immediate experience of contact but also by an orientation towards the object which has itself been shaped by culture and memories. She argues that these orientations are significant because, firstly, to hold an orientation towards something shapes what must be available in order to sustain the orientation (Ahmed, 2010b). The example she uses is that an individual who is oriented towards writing will desire and require access to objects such as a computer, a pen, and paper. And secondly, orientations determine how "subjects and objects materialize or come to take shape in the way they do" (ibid., p. 235) in the sense that, using her previous example, the act of actually writing shapes the body and marshals particular objects in support of the activity. When it comes to driving, it is useful to bear in mind that even in a new and unfamiliar vehicle, a driver is still entering with just such an orientation towards both automotive materiality and their own past experience which will shape how new experiences are perceived. For instance, a driver oriented towards family drives may find themselves assessing a new vehicle by how well it might contain and entertain their children even if this is not intended to be a selling point for the given vehicle.

This takes on a further analytical significance in that it would be, I argue, short-sighted to view emotional experience as an endpoint in itself for analysis in a predictive sense of any given driving action *x* producing emotion *y*. It becomes more illuminating to consider instead how emotions feed back into and thereby shape driving practices and embodied experience.

Contextualizing the Drive

It is important to note that driving does not occur in a vacuum. Even when a driver is on a solo commute to work, they are rarely completely alone – especially in the urban and suburban settings that this study was conducted in. The space through which a driver moves, automatically or otherwise,

is a social one filled with other drivers, pedestrians, and perhaps also passengers in the driver's own car. Because of this driving can, and does, take on a performative aspect. And furthermore, the materiality of the car will also shape and mediate the manner through which social relations between these entities might occur. In order to make sense of this environment which surrounds the driver I will now briefly introduce the work of two theorists we will encounter again later in the analytical chapters: Erving Goffman and Henri Lefebvre.

Of help in making sense of this social aspect to driving has been Erving Goffman and, in particular, his work on face management (see Goffman, 1959). Goffman argues that within social interactions people will attempt to maintain their face, which is to say their positive image in the eyes of others. To successfully do so requires both an acquired knowledge of the social expectations and values embedded within certain actions and places as well as the ability to present oneself accordingly. Failure to do so adequately can result in an upsetting loss of face, which will require some level of effort in order to correct the situation. Later in the analytical chapters we will see how this is encountered, and performed, when driving but suffice it to say here that social encounters in general are important to understanding the automation of driving in that they both facilitate a sense of comfort and flow to a drive when handled acceptably and can in themselves become a focal point of what driving becomes while it is in the process of being performed automatically. Or, put another way, the social shapes and links practices.

Later in this thesis I will also speak of the particular space which exists within a car and is shaped by its materiality. In this usage my concept of space draws upon the work of the French sociologist Henri Lefebvre, and most especially his work *The Production of Space* (1991). Lefebvre's argument, drawing heavily upon Marxist theory, is that all societies produce a unique space with their own set of spatial practices.

Lefebvre (ibid.) identifies three components to the production of space which comprise a model referred to as the "spatial triad". This triad is comprised of representations of space, spatial practices, and representational space. Representations of space, also known as conceived space, are produced by planners, engineers, and the like. He regards this space as

both a dominant and controlling space. Plans and executed designs are utilized in order to shape the space and to regulate its expected usage and the behavior which takes place within it. He also argues that in this sense the representations of space possess the capacity to intervene (p. 42).

Perceived space, connected to the concept of spatial practices, is the space of daily life and its associated patterns. It is where routines and practices take place which are shaped by, and may often be in accordance with, the representations of space. This is the space of, for example, both the daily commute and the home and office cubicle waiting at the beginning and end of it. It is also a space of both words and imagination (ibid., p. 38).

Representational space, also referred to as lived space, is the space shaped by lived experiences and subjectivity. It is also space shaped and appropriated by memories and imagination. Lefebvre also associates it with the interpretations provided by artists and thinkers shaping a vision for the space. It is furthermore a space which can run counter to the norms and expectations of the conceived and perceived spaces and as such can often be seen as subversive and unpredictable by those who may be invested in controlling and regulating the usage of the space. Representational space is also a space which may be rich in signs and implicit feelings (ibid., p. 39).

And while Lefebvre provides descriptions for each component of his spatial triad, it is also important to recognize that these three components are entangled and are not operating in insolation from one another. Indeed, he emphasizes that spatial production is a dynamic process in that "social space is not a thing among other things, nor a product among other products: rather it subsumes things produced and encompasses their interrelationships in their coexistence and simultaneity" (ibid., p. 73). Throughout the thesis we will encounter at various points these components of the spatial triad and how they can shape the car as a space. For example, in the following chapter we will look at changing representations of space to investigate how perceptions of cars and driving have shifted and evolved through time. In seeing how materials and technologies shape and guide practices we experience the spatial practices of the car. And in the final empirical chapter we will see how the practices which take place within the car might take a different form from how a car manufacturer may expect or plan for their vehicle to be used.

Methodology

I will now turn towards a discussion of the methodology employed to collect the material that will be analyzed in the following chapters. This section will begin by identifying how the informants utilized in the study were selected as well as where the study was conducted and the motivation behind both of these selections. It will then move towards addressing the specific methodological tools which were drawn upon in order to collect the empirical material. In addition, it will identify some of the strengths and weaknesses I encountered in the processes of using these methods in the field.

According to the Swedish ethnographers Ehn et al. (2016) an objective of cultural analytical methodology is to "provide a set of tools for making the everyday visible and tangible, problematizing that which is taken for granted or just ignored as trivial" by way of utilizing qualitative techniques to collect or produce "material on social life in different settings […] where the researcher is personally present in 'the field' of study" (p. 2). In this case my challenge was to select a set of methods which could investigate an everyday activity which also happens to be quite dynamic and in which movement is fundamental to the experience. And, in addition, I wished to be able to do this with both a historical and contemporary perspective.

Aside from the usage of historical materials, which will be discussed later in this section, the bulk of this thesis is derived from semi-structured interviews conducted with twenty-one informants as well as the "ride-alongs" I had the opportunity to participate in with five of these driver-informants and which will also be discussed in this section. These interviews, as well as the ride-alongs, were conducted primarily in the urban and suburban areas of the Öresund Region of southern Sweden and the Virginia suburbs of Washington, D.C. in the eastern United States. We will start by looking at both how and why these informants and fieldsites were chosen before moving to a discussion of the methods themselves.

Selection of Informants, Fieldsites, and Material

Within the research conducted for this thesis the criteria for selection of informants was kept quite broad. There were, however, two commonalities I was selecting for in my choice of informants. Firstly, I chose informants who had experience with driving. Almost all these informants were current drivers, however there was one Swedish informant who had not been a regular driver for several years but nevertheless maintained her driver's license and still held interest in perhaps purchasing another car in the future. I also made a point to select informants who were also commuters of some kind, or at least in some point of their life had been an automotive commuter. This was partly in order to be able to see how different drivers handled a similar sort of drive. But also this was because of a common view among many in, or connected to, the car industry that the autonomous drive cars of the future will, at least initially, be most appealing to middle or upper middle-class consumers as they are seen as the most likely to have both the money and impetus to want an autonomous drive car. For example, the global information services provider IHS Markit predicts that self-driving technology will begin at luxury vehicles and filter downwards, adding up to US$10,000 to the price of a vehicle by the year 2025 (IHS Markit, 2014, para. 4). Likewise, families and commuters have been the focus of Volvo Cars recent "Drive Me" self-driving car research project in the Swedish city of Gothenburg (Volvo Cars, 2015).

My second selection criterion was that all informants resided in either Sweden or the United States, though by no means did they have to be native-born Swedes or Americans. In this sense I felt that the shared experience of driving on American or Swedish roads would be of more interest and significance to this study than any potential ethnic differences. The reason for the selection of Swedish and American informants was guided both by the positioning of this study and of myself as a researcher.

Firstly, this study is the product of Swedish funding and a graduate education in the Swedish university system. And, as Sweden possesses a native car industry, which is also engaged in the design and development of autonomous drive vehicles, an understanding of the Swedish driving

public is of immediate concern and relevance to a range of local entities. And it was my own exposure to these concerns which formed my initial research interest in the topic of automation in driving through the earlier mentioned opportunity I had at the beginning of my doctoral program to observe and participate in collaborations with Volvo Cars.

The United States and China are two of the largest single markets for both Swedish vehicles specifically (Volvo Cars, 2020) as well as cars in general. Between these two places of significance, my own background as a researcher makes me better suited in this case for conducting research in the United States. This is partly for reasons of language and ability to access the field. But just as significantly, I am able to drive in the United States which presents an opportunity to reflect upon my own experiences as a driver while conducting the research. I do not possess a Swedish driver's license and thus a Swedish-only study would preclude me from being able to experience driving as a driver during the course of the study.

Almost all the informants in this study were recruited via a process of what has been described as "snowballing" (Coleman, 1958). In my case this means that an acquaintance made through personal connections or previous research would arrange to have me speak with a friend or family member of theirs unknown to me who then after their own interview might suggest a further person or two I could speak with. I felt that this might also be advantageous towards building trust in potential informants that I wasn't going to waste their time when I was being introduced via a known contact versus approaching them cold through some other medium. Although I am unsure as to whether this actually did made an informant any more comfortable with working with me, it did prove useful in recruiting participants in that almost every informant I was introduced to agreed to participate in the study.

I was not initially selecting for any specific age, however one effect of utilizing a snowballing recruitment technique was that informants tended to fall within an age range of being in their mid-20s to mid-40s, which was similar to the ages of the acquaintances who had introduced me to them in the first place. In terms of research applications outside of academia I do not believe that this is necessarily a weakness, however. Within the past decade the average new car consumer, at least within the United States, has

been 40-something in age (Kurz, Li, & Vine, 2016) and thus these informants represent a reasonably expected age range for those considered most likely to purchase a new vehicle.

The fieldwork for the study was conducted over a continuous period of time in the coastal areas of Southern Sweden as well as over the course of three periods of more intense fieldwork on the East Coast of the United States of between three and five weeks at a time. These fieldsites are largely made up of urban and suburban areas and hence informants spoke almost exclusively to the experience of driving in such environments. That rural sites were not studied was due to the fact they played little role in the everyday drivings of both my Swedish and American driver-informants. The choice of conducting fieldwork in two countries was guided in part by the factors previously mentioned relating to informant selection, but also by a specific methodological rationale in that, in the same way a historical perspective provides an opportunity to look at driving practices across time, a multi-sited investigation permits a chance to look at similar forms of driving across space as well.

A multi-sited ethnography comes with the benefit of being able to better see global processes and interconnectivities as advocated by George Marcus (1995). In doing so it also introduces a set of both advantages and challenges. On the one hand, it become easier at times to gain some sense of whether a given driving practice or value was shared between both fieldsites or was perhaps only a local phenomenon. On the other hand, it also means having to spread the fieldwork across sites versus a more in-depth period of time in one. But conducting fieldwork in both countries also allowed me an opportunity to enter the field and to explore the topic from a position as both an insider and outsider. While I am, as mentioned, a licensed and reasonably experienced American driver with regular access to a vehicle in the United States, I am at the same time an unlicensed and non-driving foreigner in Sweden without access to a car.

That one can gain another set of benefits and limitations from studying a culture from both an emic and etic perspective has long been recognized within cultural analysis (Headland, Pike, & Harris, 1990). Generally, the advantages of one perspective are also the disadvantages of the other. As an insider one may already possess knowledge to interpret a cultural practice

while at the same time missing those aspects which pass unnoticed as being overly familiar. Conversely, as an outsider, it is easier to notice and question the unfamiliar things around you, while at the same time never being entirely sure if you are able to interpret something in a manner similar to how your informant might. Labaree (2002) would, however, caution about viewing this emic/etic tension as creating an overly distinct dichotomy. He argues that while an outsider has to enter a new cultural context, the insider has to place some distance between themselves and their own cultural context which in either case makes both sorts of researchers a kind of outsider to whatever they happen to be studying (p. 117).

Being able to assume, in some sense, aspects of both positions provided me an opportunity to mitigate some of the risks associated with each positioning. For instance, being able to observe driving practices in Sweden that were relatively unfamiliar to me, such as driving with a manual transmission, provided an opportunity to observe forms of driving that were at least slightly defamiliarized to me in what would normally be a very mundane activity for both informants and myself. At the same time, being able to drive myself in the United States provided an opportunity to personally experience some of the sensations and experiences which my informants would discuss with me. This being said, it would be misleading to speak of being an insider or outsider in an absolute sense in either situation. As Dwyer and Buckle (2009) have observed "holding membership in a group does not denote complete sameness within that group. Likewise, not being a member does not denote complete difference" (p. 60). Quite often we occupy what they refer to as "the space between" (ibid.).

The American field site I entered for my research was largely contained within the Washington, D.C. metropolitan region, and primarily that part which is within the Northern Virginia suburbs. This is a fast-growing region of something over 6,250,000 people (United States Census Bureau, 2018). The region could serve as a good representative example of American suburban sprawl as it is comprised of many bedroom communities and strip malls with often no clear indication of where one community ends, or another begins. A public transportation network comprised of buses, subways, and commuter rail is present, but it is largely used for suburban commutes into downtown Washington, D.C. and the suburban areas

Figure 1. Braddock Road, North Springfield, Virginia. Afternoon of May 8, 2019. Photo in author's collection and used with the permission of Jennifer Deer.

themselves are still dominated by the car. Various types of roads can be found here from small winding two-lane roads in comparatively undeveloped areas which pre-date the explosive growth of the past few decades, to large multi-lane highways such as the I-495 Capital Beltway which circles and feeds into the city. Traffic congestion is a major problem with expansion unable to keep pace with demand.

The Swedish field site was within the province of Skåne (Scania), and specifically the more densely populated western coastal area of the province which encompasses the cities of Malmö, Helsingborg, and Lund. The municipalities directly formed by these three cities comprise between them around 610,000 people with over one and a quarter million inhabitants in the province as a whole (Statistiska centralbyrån, 2019). These three cities all possess a concentrated central urban area which is in turn surrounded by small towns and still quite expansive areas of farming. Although part of a larger Öresund Region, which includes parts of the Danish island of Zealand with that nation's capital of Copenhagen, none of my informants routinely, if ever, drove on Danish roads. Nevertheless, this wider region

Figure 2. Bangatan, Lund, Skåne. Afternoon of December 20, 2019. Photo in author's collection and used with the permission of Christiane Müller.

is connected by what informants viewed as a reasonably efficient and frequently utilized public transit network. The road network is generally made up of roads which are of two to four lanes, but the three cities are connected by the E 20 and E 22 highways which, along with the urban roads, can experience rush-hour traffic.

Sweden and the United States present an interesting set of similarities as well as differences when it comes to driving. On the one hand both are affluent and developed nations where car ownership is widespread. Both are also home to an indigenous automobile industry which has meant a heavy saturation for many decades of domestic automotive advertising. At the same time, the role of the automobile can be quite different between the two countries. Whereas both nations have large rural areas in which car ownership is desirable or even necessary, the American population remains concentrated in sprawling suburbs where a commonly experienced lack of adequate public transportation means that the car is still an essential part of daily life. This is contrasted with the urban areas of Sweden, which tend to possess reasonably comprehensive and efficient public transport networks meaning that to not

make a car an essential part of one's life, or even not own one entirely, is neither an unreasonable nor uncommon proposition. And, of course, both societies possess differing cultural values which can impact on some level the significance a car holds to its driver. This could be seen earlier in this chapter, for instance, when discussing Eyerman and Löfgren's (1995) observation that Hollywood road movies reflected a valuation of a particular kind of individualism in American culture that was tied in with the images and idealization of the earlier migration to the American West.

Interviews

Twenty-one transcribed semi-structured interviews were conducted with research participants. These interviews ranged from 45 minutes at their shortest to approximately two and a half hours at longest. Eleven of the interviews were conducted in Sweden with the informants Anders, Daniel, Ebba, Emelie, Fredrik, Ingrid, Lena, Maja, Malin, Mikael, and Victoria and ten in the United States with the informants Andrew, Angie, Brian, John, Marilyn, Melissa, Rob, Sandra, Tim, and Wendy. Interview guides were structured around several core themes pertaining to the previously stated research questions, however I also wished to ensure that each informant was permitted quite a wide level of discretion in order to carry the discussion in directions that held relevance to their own experience as drivers. This was done in a deliberate attempt to minimize the impact of my own assumptions upon what was significant or meaningful about driving.

The choice of utilizing interviews was based on their ability to produce, through analysis, a sort of knowledge which has been likened to "permitting us to see that which is not ordinarily on view and examine that which is looked at but seldom seen" (Rubin & Rubin, 2005, p. VII). My expectation was that it would serve as an effective tool for understanding the phenomenological aspects of driving. It would, after all, be difficult to understand how informants experienced driving without them being able to articulate it in some way to me. The decision to conduct these interviews in a semi-structured form was based on their ability to permit a focus to remain on the object of study while still granting sufficient latitude to probe and expand upon the depth of an informant's answer (Wengraf, 2001, p. 5).

Another strategy employed was that of focusing on *how* something happened and not *why*, an approach which tends to offer an informant the opportunity to offer a longer and more explanatory story that can avoid the problem of an informant feeling a perceived need to offer the "right" answer that a "why?" question often demands (Becker, 1998, pp. 85-86).

After transcribing the interviews, I then proceeded to code the transcripts by focusing on the similarities present across the general themes and specific topics that were discussed through the theory-guided questions that had been asked to informants. For example, each informant was asked the question "what makes a good driver?" Reading through the transcripts it became possible to identify variations of very similar answers which, although often not universal, occurred at a considerable enough frequency that it seemed important to include within the presentation of empirical material. As it would be far too unwieldly to present all answers given from all informants, a selection process by which the answer that appeared to me to be the most complete or reflected upon would become the quote I chose to illustrate the concept at hand in the analysis. This does not, however, mean that diverging answers were discarded or not considered and indeed they are at times presented in the later empirical chapters.

Like most methodologies, the interviews proved strong for answering particular research questions, and considerably less strong for others. They were highly useful at getting a sense both of what was valued in driving as well as some of the experiences around driving, particularly in how informants conceptualized and articulated their ideas of concepts such as what a pleasant or unpleasant driving experience would be and how it might make them feel. They were also critical in contextualizing driving behaviors and getting a sense of why certain actions were performed. In this they formed a core in understanding how driving was experienced.

Interviews were much less useful in understanding driving micro-practices. In large part this is due to the embodied nature of so many of the physical actions and routines involved in operating a car that can go invisible even to informants themselves. In this sense the challenge was one in line with what Adloff, Gerund, and Kaldewey (2015) refer to as the supposed paradox of tacit knowledge, that "if this kind of embodied and pre-reflexive knowledge underlies all of our actions and all knowledge

production, then how is it possible for us to access it?" (p. 7). Interviews were often not the ideal way to do so. Certainly, no informant would be able to conceptualize and articulate the full and complete range of actions and perceptions that occur in the course of even a short commute to work. A further, and unavoidable, challenge is that posed by the instability of language itself, especially when the interviewer or interviewees are utilizing a second or even third language, as was sometimes the case in this study. Meanings and significance in these situations can potentially be misconstrued (Scheurich, 1997). Although at no point in the study did I feel that I had trouble accurately understanding any given informant, or vice versa, I am aware that it is certainly possible that misunderstandings still occurred which went unnoticed.

Before concluding this discussion on interviewing it is also worth noting the influence of informal and unplanned field conversations on the study. Innumerable conversations were struck up with a range of individuals throughout the research process who were eager to reflect on anything from their own daily driving routines to experiences with current or past vehicles they had owned. Such conversations have also been remarked upon by other ethnologists as being a rich and important source of empirical material for their own research. In her study of the production of history in Swedish football clubs Katarzyna Herd (2018) notes that while she had not planned for such chats, she quickly found that many individuals were so eager to talk football with her outside of the expected fieldwork periods that it became valuable to pay attention to these conversations. As she notes, these informal chats can "reflect the *experience* of the field, and its multi-dimensional character" (p. 45). Though in my case none of these informal conversations were recorded and transcribed, and a great many passed without either the opportunity or thought to be put immediately into the fieldnotes, they very much contributed towards the study in providing me with a wider exposure to the thoughts and opinions of drivers. This facilitated both the framing of my own conceptualization of driving as well as the research process by shaping many of the additions and alterations to the interview guide for any future formalized interviews.

Ride-Alongs

Five ride-alongs were also conducted for this study. These involved tagging along as a passenger with willing informants on driving trips that were already planned as a part of a normal day for them, such as a trip to the store. The intent behind engaging in ride-alongs was to observe driving in actual practice, which in this case means to be able to observe the routines and micro-practices of driving as they occurred for an informant on a drive. Three of these ride-alongs occurred in the United States, with the informants Brian, Melissa, and Sandra, as well as two in Sweden with Emelie and Fredrik.

Prior to conducting the study my thought was that these ride alongs would be a quite passive form of what Barbara Czarniawska (2007) refers to as "shadowing", a methodological call to produce new forms of knowledge by seeking out lived, dynamic practices within their own context (p. 17). These can often be practices which may be readily observable in the moment if looked for and yet are difficult or impossible for an informant to articulate after the fact. My anticipation was that I would quietly observe and record what I was seeing, and perhaps occasionally interject to clarify or receive context on why something was happening. It quickly became clear that this was not going to be possible, or even necessarily desirable.

The presence of a researcher, or even a general "other", will tend to shape and affect the behavior of an informant (Davies, 1999, p. 4). This proved to be especially true with driving in which passive observations turned, from the very first ride-along, into active participant-observations. First, and most immediately noticeable, I found myself occasionally treated as a resource to be conscripted into serving as an extra set of eyes for the driver. This could be in the sense of helping to see around a large sport utility vehicle (SUV) which might be impairing the informant's vision prior to a turn from a stop sign. It could also be in the sense of helping to read road signs that a driver had trouble seeing in order to aid in navigation.

But secondly, and more significantly, it became clear through experience both in the ride-alongs, as well as the answers informants gave in interviews, that people do not drive the same when others are present. Being perceived

as a competent driver is important. An unskilled driver is often not just unskilled, but an "idiot", or worse, and no one wants to be an idiot. It is difficult to speak as to how, precisely, this came to affect the driving experiences as any attempts to presume what was or was not atypical would be largely speculative. But I found that the greatest predictor of whether or not an informant carefully followed traffic regulations or performed other "correct" and cautious driving behaviors, was generally not age, gender, or ethnicity but rather how familiar I had become to the informant. The relation between the two was negative in that the more familiar I was to the person I was riding with, the less concerned they appeared to be with coming across as a driver who drove "by the book" so to say. Taking a hand off the wheel, slouching in the seat, and expressing road rage were all behaviors that tended not to show up in drivers who I had just met. In this sense the contrast between the two provided an effective way to make visible some of the cultural norms and meanings associated with driving.

The primary strength of the ride-alongs was that they were particularly well suited for being able to see the unremarked-upon micro-practices that comprise so much of driving. Especially when the fieldnotes of these observations were combined with the asking of questions to the informant both during and after the drive, they were able to provide a large amount of empirical material that could be utilized to look both at how driving can be automated through embodied practice as well as empirical examples of how practices and perceptions feed into, and off of, one another.

Part of what made these ride-alongs so effective has been articulated by Margarethe Kusenbach (2003) who, in referring to her very similar experience with a "go-along" methodology used to investigate the lives of individuals in an urban neighborhood of Los Angeles, argued that "go-alongs develop phenomenological themes by placing researchers in the mobile habitats of their informants, thus facilitating access to their experiences and practices as they unfold in real time and space" (p. 478). She further argues that they also provide a means to make visible what might otherwise pass invisibly, or, in other words, what might exist as a form of tacit knowledge. This provided her a means to at least mitigate the challenge, if not impossibility, presented by attempting to illuminate this knowledge through qualitative interviews alone.

A weakness of the ride-along methodology in my usage was, most commonly, the aforementioned suspicion I had of the tendency, articulated or otherwise, for individuals to drive "unnaturally" in the presence of others to a greater or lesser extent. But in addition to this I also found that it was often the most intense or unusual parts of a drive that would go unremarked upon in the stress of the moment. The more cognitive attention a given situation demanded of an informant the less willing or able they would be to speak to me for some period of time. This can be somewhat mitigated through asking the desired questions later or asking the informant to reflect on the situation after a drive, but by that point that the situation may have unfortunately already long passed and faded from a driver's memory.

Historical Materials

While conducting my research I had the opportunity to access the library archives of both Lund University in Sweden as well as George Mason University in the United States. I used this time to read, predominantly, advertising materials and magazine articles which pertained to the time periods I wished to investigate in my analytical chapter on the historical perspective of automation in driving. The usage, and analysis, of historical materials is common within ethnographic research and doing so provides an opportunity to view familiar everyday objects or practices by seeing them as parts of wider social and cultural processes (Ehn et al., 2016, p. 31). My own objective for the usage of historical material was to see how driving had been depicted and idealized through advertising and popular culture over time. This also provided a means of analyzing historical driving for which the other fieldwork methods I employed would have been largely ineffective. Firstly, no informant I had the opportunity to speak with was driving a car during either of my two historical periods of interest. And if any of them had been, I would still have been limited to a recollection of old memories since cars, and the experience of driving, have changed significantly over the decades as we shall see.

I began collecting historical empirical materials by making a request to the special collections librarians for any automotive advertising material they held in their archives that was produced by American automotive

manufacturers for the decades of the 1910s and the 1950s. Starting with this large bulk of mostly magazines and pamphlets I would then code the material by what appeared to me to be the main trait of the car that was being advertised in the advertisement or article; e.g. climate control, a smooth ride, a luxurious interior, etc. Later this material was analyzed utilizing the same set of theoretical concepts used in the other analytical chapters and was also further fleshed out by the significant amount of historical material pertaining to cars and driving which can now be found online. Especially useful here were the mass of old television automotive advertisements available at video-sharing sites such as YouTube. Due to the sheer amount of material available that pertains to even just the American car, it proved necessary to establish limits on what sort of material would be collected. For example, materials relating to historical sports cars were not collected as the sports car was not a part of the everyday driving of the majority of drivers; historical or contemporary. Likewise, I attempted to utilize vehicles which I felt were good representative examples of some of the new automotive technologies that were coming into use during their respective periods. This meant that some cars which were certainly emblematic of their era, such as the Ford Model T of the early twentieth century, were not necessarily the focus of analysis for this thesis in that they often seemed to represent values such as mass affordability and availability versus evidence of major shifts in driving which shaped the cars that came after them.

Lastly, there was another reason for a deliberate attempt to point a part of this study towards the past. Unsurprisingly, most research which studies automation in driving tends to look towards the future of self-driving technologies. Such research is most certainly important, but it can also leave open a blind spot in which it becomes harder to see the incremental processes which have led up to the way in which people today are able to orient themselves towards future forms of automotive automation. In this way the knowledge produced through a historical approach to forms of automation in driving can complement the research which many others are conducting that is orientated towards the future.

Autoethnography

In the initial planning for the study no allowance had been made for utilizing autoethnography as a methodological tool. It soon became evident, however, that its impact on the study would be almost inevitable. Simply put, autoethnography is a research method in which the same individual serves as the subject and object of an ethnographic inquiry (Ehn, 2011, p. 53).

Deborah Reed-Danahay (1997, pp. 1-17) observes that traditionally autoethnography as a concept can refer both to writing about a culture from an emic perspective as well as writing from an autobiographical perspective. However, she argues that the lines between these two perspectives are quite blurred in that the self as a researcher is not split from the society which it is located within. An autoethnography can be a text, but it can also be a deliberate methodology to explore cultural practices through a researcher's own experiences. This does not come without some controversy, however. As Sally Denshire (2013) observes, writing oneself into a story "goes against the grain of much academic discourse" (p. 1). This is largely due to a fear that in doing so one has compromised a perceived level of objectivity, or even might be seen as the researcher performing a form of "navel-gazing" in which he/she prioritizes him/herself over the research participants.

While I did not intend for my research to be autobiographical, I also did not want to ignore the fact that I am a driver. Rather than attempting to pretend it had no effect upon my research, I wanted to try and transform it into a methodological strength, or at very least a tool which could be used to shape and inform the other primary methodologies previously discussed. The main way of doing so was attempting to always drive in the field, as much as is possible, reflexively. This entailed paying close attention to what I was doing in the car, as well as what I was witnessing on the road, and to then incorporate these observations and thoughts as soon as possible into the field notes.

During each period of fieldwork that was conducted in the United States I made a specific point to take a road trip of at least several days duration in order to provide the opportunity for a more intense and

immersive experience of driving. These trips involved driving up and down the East Coast utilizing a range of driving environments from small roads to multi-lane highways through familiar and unfamiliar rural, suburban, and urban places. A normal day on such a trip would usually consist of 6 to 12 hours of driving and would conclude with an opportunity to jot down thoughts and observations from the course of the day.

This did not directly contribute towards informing how other informants drove, nor did I want to blindly assume that my driving practices were the same as theirs. But what it did provide was a chance to provide new points of discussion, or to identify behaviors that I wished to pay extra close attention to, in order to strengthen the rigor of the interviews and ride-alongs. For example, noticing particular driving situations which caused me special stress or pleasure could then be brought into a discussion with informants who, in either sympathizing or disagreeing with my own experience, would then often articulate quite well their own thoughts on the topic. And, conversely, having the opportunity myself to both experience and reflect upon some of the same situations encountered by my informants provided a means of making sense in my interpretations of what was being told to me.

Ethical Considerations

In its guidelines on good research practice, the Swedish Research Council (2017) observes that a fundamental responsibility for a researcher is to weigh the "balance between risk and benefit" when designing and conducting a research project (p. 20). The Council further points out that all research, no matter how seemingly innocent, involves a cost of some kind from participants even if only in the usage of their time and exposure to some form of risk. While the production of knowledge is both valuable and important, it is incumbent on the researcher to ensure that the design and conduct of a study does not place undue risk on the voluntary participants upon which it depends.

Bearing this in mind, I always strove to minimize any form of risk for participants in my study. In general, the topic of driving did not involve touching upon sensitive or compromising material for informants. It was

perceived as a routine, if not mundane, activity and no informant felt troubled by discussing it. At all times consent was sought and given by the informants who appear in this study and they were always notified beforehand that they could end their participation at any moment they wished or to refuse to answer any question which they felt uncomfortable with answering. Any material collected through means such as the informal field conversations that was not accompanied by an explicit request for consent is left out of direct empirical discussion and was only used to inform the analysis of the material that is presented. Driving is an inherently dangerous activity and as such ride-alongs did involve some level of physical risk to both participants and myself. However, these drives were undertaken as a part of everyday life for the participants who agreed to let me join them and at no point did I request a driver to drive in a manner different from how they would normally operate their vehicle.

A potential ethical concern is the fact that informants would occasionally discuss, or perform, driving actions that would officially be considered illegal. Typically, this would take the form of speeding or occasionally some other minor driving infractions that might receive a fine if seen by law enforcement. I remain confident, however, that not only would authorities in both countries be unlikely to take interest in this after the fact, but also that in no case would a driver be identifiable to them, particularly as dozens of similar behaviors can be witnessed on any given drive within a widely-spaced geographic region consisting of a vast number of drivers.

A second concern was making sure that my affiliation both as a university PhD candidate as well as a researcher with some research project ties to Volvo was made explicit to any informants who took part in the study. None took any issue with this fact but I felt it important to ensure they were aware that anything I wrote or said about them would not only go into a thesis or some other form of standard academic work but could, conceivably, also be presented to representatives of automotive manufacturers and/or potentially be used for commercial purposes at some future point in time.

In line with general ethnological research praxis all informants are anonymized within this study. A considerable amount of personal information about the informants has been either altered or left out entirely,

especially when I felt it was immaterial to the analysis. Informants were warned, however, that this anonymity could not be guaranteed. But I believe that identification by outside parties unfamiliar with the informant is very unlikely given the difficulty in identifying a particular driver amongst the very large numbers of drivers in both Sweden and the United States.

Overview of the Thesis

Next, in the second chapter of this thesis, we will look at a historical perspective on the automation of driving. In doing so the aim is to use history both as a methodological tool to expand the temporal horizon in order to see what may be learned from driving over a longer period of time, as well as being a source of empirical material in its own right. The academic objective of doing so is to contribute towards answering the first research question of demonstrating how the car has developed through time in a manner which can facilitate automation. Doing so can illustrate the way in which changes to design and technology permit new practices of driving to emerge while at the same time altering or ending others. These changes also come to shape both the values and expectations of driving and the relationship we have with our vehicles as they increasingly assume greater control and responsibility over a drive. As it would be beyond the scope of this work to present a complete historical overview of driving this thesis chooses instead to focus on two periods in the development of the American automobile which can be argued to be key points at which drivers encountered new forms of automation in the car and helped to shape how we understand driving today. The first period looked at is the 1910s in which the car itself first gains widespread acceptance and usage as a common means of transportation and is seen as more than just a novelty or a luxury. It is also a period prior to the development of many of the automated systems and design features on cars that we take for granted today. It will then turn to the postwar years of the 1950s - the era of "push button driving". This was a period of time which experienced significant changes to both the built landscape and the society in which the car was placed and one which saw both the first introduction and the first widespread acceptance of many forms of automated technologies, such as

automatic transmission and power steering, which are common in vehicles today. And, equally significant, it is often perceived as a golden age of American automotive design (see Wernle & Bolduc, 2004, para. 2). The chapter will then conclude by bringing us up to the present day.

The third chapter will provide an empirical look at how driving comes to become automated and experienced as an automated activity today. In doing so it aims to finish answering the second research question of the thesis; namely how driving can be understood as being already automated and the role the car itself plays in this. It will start with an account of a ride-along with the informant Brian who, despite taking me along for a drive in which it can be argued a great deal happened, later came to feel upon reflection that nothing remarkable had happened on the drive at all. It will then seek to show that this as a clear example of a drive being performed automatically and to explain how present driving practices can become automated through a combination of skilled practice and embodied knowledge. From here the chapter will proceed to investigate how the materiality of the car itself creates a space from which automated driving is possible and how familiarity with sensations felt from and through the car is critical. Lastly, the chapter will discuss the ways in which already existing items of automated technologies in the car are adopted, or rejected, and how they are marshaled into automatic driving practices.

The fourth chapter will investigate through the empirical material what driving becomes once it is automated. In doing so it aims to answer the third research question of this thesis. This chapter opens with a look into the realms of daydreams and contemplation that are opened when a drive is performed automatically, and the mind is therefore considerably freed to wander. But besides being an occasional place of solitude, the car can also be a place of socialization and the chapter will briefly look at how the social encounters which can take place within the car are also facilitated by automatic driving. Next, it will argue that a car being driven automatically can serve as a "time machine" for its driver, enabling both perceptual and actual manipulations of time and distance. It will then close by telling the story of an uncomfortable winter drive with the informant Melissa and will show why this and other drives may be experienced as dangerous, frightening, or boring while other drives might be seen as

exciting or pleasant. In doing so it aims to show the ways in which driving automatically can permit the production of a range of spaces which transform the car into something other than merely another means of transportation. Doing so will also show why a sense of flow is so important to a drive by illustrating the break point of automated driving which occurs when forms of friction are met on the drive.

The fifth, and final, chapter, will present the conclusions of the thesis. In doing so it will summarize what has been argued within this dissertation by showing what has been learned about automated driving at present. It will finish by observing that these experiences will shape and orient drivers towards the manner in which they understand and receive the idea of an automated driving future.

Chapter 2
Historical Perspectives on the Automation of Driving

If we are going to look at how driving might already be automated at present, it is useful to begin by looking at how the car has been automated in the past. After all, new technologies and cultural practices do not arise from thin air, but rather develop through a process over time. While a complete overview of the history of automation in the car would be outside the scope of this thesis, what we can do is look at selected themes which have been integral to the way in which the car and driving have come to be understood today. As such, the objective of this chapter is to contribute towards answering the initial research question of this thesis; how has the car developed through time in a manner which facilitates automation? It will do so by looking at a history of automation in driving from an embodied perspective.

An analytical challenge in doing so, particularly for a thesis which draws heavily upon a phenomenological analysis, is the inability to physically experience driving in the past with the same set of knowledge, skills, and experience that existed at that time. While a researcher might be able to take a ride in an old car or to speak to an individual who remembers driving in the time described this is still not exactly the same thing. Contemporary drivers have since acquired a new set of experiences and expectations through which to filter such an experience. Furthermore, a road of 2020 is not the same as a road of the first half of the twentieth century. Many of the newly automated technologies of the 1950s cannot seem anything but old fashioned or quaint today to those who have experience with riding in present vehicles.

In the previous chapter I spoke of Henri Lefebvre (1991) and his concept of representational space. This is space as experienced by the users and consumers of the space. It is also where unforeseen appropriations and reimagining of the space takes place as people discover new ways to make use of it. This is also the space which we now lack access to when it comes to the historic car, at least as it was experienced by users contemporary to the times described.

But what we can do is look at the representations of these spaces. For Lefebvre this is the space of planners and engineers. It is where the plans of engineers and designers are conceptualized and made physical as the space itself is produced. This will serve as the point of departure for the analysis of this chapter. Utilizing advertising material and popular culture we can see ways in which automation was produced through the commercialization of the car and perhaps gain at least some glimpse into the phenomenology of the car through the way in which it was being conceived. Furthermore, lived and perceived space is not completely separate from conceived space. Advertisers of the time, and today, are basing their images on what they believe the consumers of their time desire and value. Utilizing this material, we can follow some of the represented traces of what the past car was, even if we can't sit in the car with the same embodied orientation anymore.

This chapter will not, however, argue that the car has evolved through any sort of process of hard technological determinism which brought its drivers along for the ride. Rather it shares an agreement with Mackenzie and Wajcman (1999) that paths of innovation are shaped and molded by those societies in which they occur (pp. 22-23). We will see in this chapter that while the car certainly shaped the lives of its drivers, drivers in turn shaped the development and expectations of the car. Sometimes a vehicle managed to fit with considerable success into the established practices of drivers and their images and dreams of what a car should be, and other times it failed spectacularly. Looking at the development of the car over a period of time illustrates the way in which incremental changes have shaped an understanding of automatic driving.

In this chapter we will look at this development by drawing upon American advertising material from two historical periods in the

development of the automobile in the United States: the early twentieth century as well as the mid-century post-Second World War period of the 1950s and early 1960s. These periods have been chosen because they represent in many ways two particularly transformative periods in the history of the car: the introduction of the automobile as a mass-produced consumer good in the case of the former, and in the latter the introduction of the ideal of "push-button" driving and some of the earliest versions of many of the technological forms of automation that we experience as commonplace today. In an American context this latter period also represented the expansion of suburbia which has solidified the importance of the car to American society. My decision to focus on American empirical material in this chapter is guided both by the fact that during these two periods the American automotive industry was seen as being in the vanguard of a great many of the new technologies and designs which impact cars and driving in both America and Sweden today, as well as the fact that the car played a significantly more dominant role in the American society of these two periods than was typical elsewhere. For instance, prior to the First World War it was only in the United States that the car was a part of daily life outside major cities and had already for some time been established as being significantly more than a curiosity by 1920 (Osterhammel, 2015, pp. 305-306). And, furthermore, as was mentioned in the previous chapter, the very word automation itself came out of the American automotive industry of the postwar period.

But it was the beginning of the twentieth century which witnessed the mass introduction of the automobile. What had previously been a technological novelty was now a widely available consumer product thanks in large part to mass-production of the sort pioneered by Henry Ford. This was a world in which the car represented the status and comfort which was associated with being able to personally enter and be a part of an increasingly industrialized and mechanized world, a world of both awe and terror as epitomized by those battlefields of the First World War which saw the declining significance of the horse and the proliferation of the tank and airplane. This was also the first generation in which vehicles began to take on a form that could be easily recognizable as a car today. These cars may still appear outdated and boxy to contemporary eyes, but they were a quite

dramatic change from the very first cars which had the disconcerting appearance of being a carriage buggy missing a horse and in which the experience of being in a car was more one of riding on top of a vehicle rather than being enveloped and enclosed by it (Gartman, 1994a, pp. 21 & 31).

Insulating and Floating

It is likely that Ford's Model T is the most memorable and emblematic automobile to come out of the first quarter of the twentieth century. The Model T was a revolutionary vehicle for what it represented in being still today a case study in mass production within a modern consumer economy. And it was also the first truly affordable car. For instance, the average assembly line employee at a Ford manufacturing plant could realistically expect to save up to buy one for themselves as at the time of the introduction of the Runabout model in 1908 it was already selling for a relatively affordable US$825 (Smil, 2018), which is something approximating US$22,000 in today's value (CPI Inflation Calculator, 2018). This was at a time in which the average wage of a unionized Detroit machinist was around US$950 a year (United States Bureau of Labor Statistics, 1913). Many discussions of the cars of the 1910s and early 1920s speak primarily, if not exclusively, of the Ford Model T and with good reason.

But what focusing on a Model T does not necessarily provide is insight into what was valued in a driving experience – or rather if it does it is often in a backwards sort of way. The Model T was meant to be a highly functional and affordable means to get from A to B and not, necessarily, to be actually enjoyable to ride in (Gartman, 1994a, p. 58). Nor was it seen, even in its own day, as much to look at as one 1927 newspaper article hints at when reflecting, perhaps a bit nostalgically, upon the Model T in the final year of its production run:

> "Who can still call to mind the 1908 flivver: a rickety top which was held up by long straps from its front edge down to a point just behind the gas lamps; a huge two-part windshield, trimmed in brass and fitted with two long brass rods running forward to the bottom of the radiator as supports; a vertical wooden dash, no front doors, a high back seat?" (Billings, 1927, p. 3)

Likewise, Henry Ford's announcement of the first Model T spoke to the affordable possibility of automobility provided for the average family versus any mention whatsoever of the actual drivability or performance of the vehicle. Indeed, it did not take long before the Model T became the butt of vaudeville comedy routines:

> "Salesman: 'Can I sell you a speedometer?'
> Customer: 'I don't need one. At 10 miles an hour my teeth rattle, at 15 my fenders rattle, and when I'm going 20 the transmission falls out.'" (Nash, 1964, p. 53).

The resonance of this joke, and the many others like it, was that no one was expected to purchase a Model T for a nice driving experience. One tolerated the rattling teeth and any sense of a "rickety" design because of the affordable automobility. It is perhaps therefore more fruitful – particularly in light with all that has already been said elsewhere about the Model T– to look a bit more closely at the proliferation of auto manufacturers at this time who offered the mid and upper-priced cars in which the advertising focus was placed more on the experience of driving them and which better represented how a car of this time was supposed to be in an idealized sense.

First Encounters

Driving in this era had two characteristics that are perhaps today difficult to imagine. Firstly, any sort of formal and standardized training and licensing in the United States was mostly unheard of. The State of New Jersey was unique in by 1913 already requiring its drivers to pass a written test before they could drive, but this was not duplicated elsewhere for some time. In other places where licensing was present it was often, as in the case of New York, required only for professional drivers, such as chauffeurs.

Secondly, most anyone purchasing an automobile in this period would have been a first-generation car driver. It is easy today to forget that most of us have had the opportunity to watch cars being driven continuously from our birth onwards and we can learn and ask questions from the adults

and experienced drivers in our lives. In this period, however, even quite young adults would have been born into a world without cars and drivers to observe and the previous frame of reference for automobility was often that of the horse and buggy. And while at the turn of the century this new world of automobiles was one of promise and hope, in which some even thought the extinction of the horse could be imminent (Townsend, 1901), it was also one which could at times be not entirely comfortable and one which also brought along for many a sense of sensory overload and danger that we are today often unfamiliar with, or at any rate more at ease with:

> "[With the hundreds of styles of automobiles] in a crowded thoroughfare during business hours, a pedestrian can hardly cross a street, for automobiles at present seem more dangerous than horse driven carriages. And the noise is deafening. Every motor carriage has taken to a new warning instrument. All the horns and bells sounding at the same time is bewildering, for the ear has not yet got accustomed to it, and the poor walker, while looking to the right runs the danger of being run over on the left and vice versa." (Brooklyn Daily Eagle, 1899, p. 17).

These very first cars could easily appear to be little more than frivolous, dirty, and disruptive novelties for the wealthy and the lack of established practices and understandings of how a pedestrian should move in the presence of a car, and vice versa, or how cars should move in the presence of each other, could lead to the anarchic image we see painted above in turn of the twentieth century Brooklyn.

But despite the seeming mechanical simplicity of these early cars it would be a mistake to assume that this would mean that they were simple to learn how to drive either to people then or now. This was, after all, an era before many of the automated features which we take for granted in a car existed. The process of just starting an automobile from this era, even in those models which possessed electric starters that avoided the need for hand cranking, can seem rather bewildering to a contemporary driver as the following passage from a 2008 review of the 1923 Ford Model T Touring car shows:

> "With the planetary two-speed transmission in neutral, turn the key to the magneto indictor, step on the starter button, and once the engine turns over, turn the key to the run position. It's not intuitive, but it's definitely easier than the hand crank. Don't forget to adjust the spark and throttle at the same time [...] Release the handbrake while simultaneously applying pressure on the clutch pedal to keep it in low gear [...] Remember to apply gas via the throttle lever, and you are off." (Elias, 2008, para. 16-17).

While a driver of today might recognize what a handbrake is, or be familiar with stepping on a clutch pedal, the bulk of these steps and technologies would likely be completely unfamiliar to all but the most devoted specialists of antique cars. As technologies change the micro-practices which comprise a larger practice become disrupted or disappear and consequently require new practices and understandings to form around the technology. While an engine still needs to be started, the now universal usage of electric start technology ensures that the process has been made invisible to most contemporary car owners.

The quote is also illustrative of the fact that the ability to drive is, and has always been, a learned process and one which requires the development of a specialized set of embodied skills involving some form of both cognitive and physical effort. Besides describing the process of starting the Model T the same author notes that driving one is "not for the faint of heart" (ibid., para. 15). In addition to requiring physical motions and a sequential chain of steps to start the vehicle that would be unfamiliar today, the location of the assemblage of mechanical controls involved in operating it would likely pose a significant learning curve even for a reasonably proficient modern driver despite the relatively simplistic initial appearance of the Model T's interior. The paucity of gauges, pedals, and levers present, and any notion of a simplified technological past vis-à-vis a more complex present, becomes quite irrelevant when the embodied knowledge of operating the equipment and the general feel of the car, honed through practice, is not present for a contemporary driver.

In Figure 3 we see that there is much which could be considered as unusual today. For one thing, the throttle for accelerating the vehicle is located as a lever on the wheel. For another, while there is no dashboard

Figure 3. Driver's seat of a 1920 Ford Model T. Turvey, P. (2007, September 30). Ford Model T 1920 [Photograph]. Retrieved from https://commons.wikimedia.org/wiki/File:1920_Ford_Model_T_Controls_(1495288990).jpg.

fuel gauge there is an ammeter to indicate the net power in the car's electrical system. But aside from quirks such as these, we also see that the car has already taken on a physical form that is still recognizable as being a car today. The body of both the driver and passengers is oriented forwards and the design of the vehicle presents a sense of envelopment while still permitting visibility around the vehicle. Furthermore, the placement of the material technologies of sparks, chokes, and clutch controls facilitated in one sense an easy automobility of being able to operate all essential features of the drive while sitting, while at the same time they necessitated a certain learning curve in understanding just what the controls actually did and how they could be manipulated.

However, much of the material one encounters in this era suggests that being a skilled driver was not necessarily always a point of status. If anything, a deep knowledge of cars and how they handled was associated

with professional drivers: chauffeurs, instructors, auto salesmen, and the like who were firmly rooted in the blue-collar world. This is epitomized in one example of a purposely humorous article of the period found in Vanity Fair magazine in which the author of the piece, a white-collar employee of a New York City law office, seeks to buy a car. Originally for him cars "existed, and people who drove them talked about clutches and gears and things, but I never dropped down to such a low mechanical level as that. I'm in a law office, you know" (Funnell, 1917, p. 71). And aside from that he didn't feel he had enough money to spend on such a thing anyway. But after acquiring inheritance money from an uncle he thought he should do as others do and purchase a car. Not having any knowledge of how to operate one did not initially seem like much of a hurdle, or as he puts it "I rather expected that when I passed over the check and became official owner of that run-about, I would somehow instinctively acquire the ability to drive it. But nothing like that [happened]" (ibid., p. 71).

The gentleman decides to hire a driving instructor three days a week and eventually gets the hang of driving after causing his instructor a few headaches. At the conclusion of his lessons he and his instructor engage in a conversation, which comprises the majority of the piece, on the challenges of teaching women to drive. In this part the dialogue of the instructor oozes a folksy quality, which also serves to highlight the disparity in social class present between them, as when the author inquires as to whether anyone gives him more trouble than he did while learning: "women, for instance?" the pupil asks. "Women, f'r-instance! You said somethin'. [...] Mister, believe me, don't never try to teach a fat lady to shift gears - not on a car you love like it was a cut of porterhouse. Maybe you've seen your wife make a sour face when the kid ran a nail along the piano to see if the varnish was perfect, like the ad says it is. Well that's how I feel when somebody rasps gears going from low to second" (ibid., p. 114). It is not too difficult to see that the portrayal of the driving expert is far from high society – especially in comparison to the driver himself who always speaks in a "proper" manner throughout the narrative.

While possessing sufficient skills and knowledge to operate a vehicle competently is portrayed here as being a part of modernity, the "respectable" man, and even more so woman, is expected to not be overly comfortable.

To be able to operate a vehicle too easily is to risk marking oneself as being a part of the working class. This is also to say that one who can drive without effort can probably do so because they are spending their time driving rather than engaged in more useful or appropriate endeavors. The car is very much a machine and one in which the functions it serves to facilitate for its owner are more important than the formation of the perception of a strong connection between the car and its driver.

This same piece, as the previous extract makes plain, also hints to the fact that the car, in being perceived as a machine, entered into what would also be perceived as belonging very much within a masculine domain and one that would involve differing experiences and expectations for a female driver versus a male driver. Indeed, from the beginning car manufacturers tended to think in terms of vehicles, and vehicle advertisements, that were meant for women versus men. Scharff (1991) argues that this was a product of a gendered struggle over the symbolism of the vehicle. While the mechanical nature of the car, and the automobility it afforded, placed it within a spectrum of masculine values, suffragettes viewed the car as potentially representing a "symbol and vehicle of female emancipation" (p. 87) by its ability to grant women access to this automobility and a consequent form of self-sufficiency. After realizing they could not ignore women outright, manufacturers sought to preserve the masculine image of their vehicles by first attempting to differentiate between male and female cars and then later finding ways to frame technologies of convenience as being concessions for women so that they would not threaten the masculinity of their male consumers "perpetuating the idea that women, not men, favored such labor-saving innovations" (ibid., p. 60). One such example is that of the introduction of electric start which was seen as making the operation of cars considerably simpler, and hence more accessible, for women even though, as Scharff observes, undoubtedly it must have had the same effect for men.

A popular perception of this time period of the early twentieth century was that while a woman could functionally drive, she would likely have a childlike naivety to a complex machine which she would have to struggle to overcome. If a New York businessman faces challenges in acquiring the rather blue-collar skills of driving, he can find comfort that at least he is not so bad as a woman:

> "So she throws out her clutch, and chucks the gears in low. Then she gets on a wistful look like she was thinkin' about the daintiness which nature had given the flowers, but had denied to her. Gradually she lets in that clutch. It took her five minutes to get her foot all the way back. Then a very 'blank and injured innocence' look as locomotion fails to set in. 'Why–why,' she says, 'something is wrong. I let it in very gently and we aren't going at all!' Then I says to her, with great tact: 'Madam, you forgot to start your engine.'" (Funnell, 1917, p. 114).

In such a depiction it is not just her unfamiliarity with the practices involved in driving that is meant to be ridiculous, but the absence of even a basic level of mechanical knowledge and prowess. Perceiving this sort of extreme ignorance as a feminine trait in some sense helps keep the act of learning how to drive from itself being seen as too feminine. Our male driver here may require some assistance to learn how to operate his new vehicle, but we can probably assume by the choice of anecdote that he would know if a motor was running or not. But even when women possessed the same skills and knowledge it did not mean that gender left the car so to speak.

In his study on the stereotype of the "woman driver" Michael Berger (1986) has argued that the increasing access to mobility that women possessed through the car created a real concern for public morality. As he explains: "Although often presented in a humorous context, folklore concerning women drivers, and the accompanying negative stereotype emerged for very serious social reasons. They were attempts to both keep women in their place and to protect them against corrupting influences in society, and within themselves" (p. 257). If women are portrayed as incompetent drivers, then it stands to reason that they probably should not drive so much, and certainly not on their own where they can really be a menace to themselves or others. While driving is a skill which most segments of the population might have had a theoretical access to, it did not mean that automobility was meant for everyone.

But it is also worth noting when we speak of technologies of convenience that convenience is a very fluid concept in the manner in which it affects practice. As will be observed elsewhere in this thesis, a practice opens possibilities for new interconnected sets of practices while closing off the

possibilities for others. Thus, an object intended for convenience ties people "into an ever denser network of inter-dependent, perhaps even dependent, relationships with the very things designed to free them from just such obligations" (Shove & Southerton, 2000, p. 315). In the case of the car convenience could certainly be found in the new freedoms afforded by automobility. But as we saw it also meant investing in learning how to drive, in addition to developing new time consuming and/or expensive routines of automotive maintenance, refueling, and the like.

Beginning to Float

But perhaps it was this relative lack of familiarity which many new car consumers of this era had with the acquired embodied skills of driving, combined with the fact that even the most affordable cars were still a bit more of a luxury purchase than today, that explains why in the advertising of this period surprisingly little is sometimes said about the driving performance of the car. The emphasis can often be far more on the statement of luxury the car makes and the physical and aesthetic feel of the inside of the vehicle. A typical example can be found in the printed advertisements for Mitchell automobiles. One such ad says nothing whatsoever about the engine of the vehicle but instead highlights the quality of the soft leather, the "deep, lustrous [painted finish] that will last for years" and that it features "a locked compartment for valuables" (Mitchell, 1917, p. 89).

The one mechanical component of the car which the ad does highlight is the Bate cantilever springs that enable the occupants of the vehicle to "float" over the road. Technology is here a means used not to improve the driving performance of the car per se but rather to enhance the comfort of the driving experience, by way of isolating the driver from the unpleasant physical experience of bumping along the road. Luxury, in this case, is to be able to experience a drive through bodily sensations of floating or gliding rather than any sort of true feel of being directly connected to the road. This also points to the fact that automation can be conceptualized as something facilitated by more than just the digital forms we tend to think of it as taking today. Indeed, as was mentioned at the beginning of the thesis, the word "automation" itself was not yet even in general usage within the

English language. But this does not mean that there was an absence of the usage of technology and design to smooth the experience of driving.

However, to perceive a task as being automated requires some knowledge of how the task was performed prior to the change. As the cars of the 1910s were, for most of their owners, the first automobiles they had owned or even rode in, there was little point in trying to argue how much more technologically advanced the new models were as compared to the earliest automobiles of the 1890s, which most drivers had lacked access to in the first place. But if technology was not described as being "automatic", it often could be portrayed as "practical" as seen in the Kissel Kar advertisement in Figure 4. To be practical is to be well-adapted to facilitate the practice of driving in this case. And while the concept of automobility may not have been new in a world of horses and bicycles, both these modes of transport involved a very direct bodily relationship to the sensations of the terrain and weather. One might technically be able to ride a bicycle on a nasty winter day, but the question is whether one would actually want to.

In the case of Mitchell's Bate cantilever springs it is the techno-materiality of the system itself that is supposed to facilitate an enhanced driving experience. A driver who is "floating" above a road is implicitly able to operate their vehicle more effectively than a driver overloaded by physical sensations. In this way an objective of this form of automation, as it developed, was not only to make a car easier to operate but also to make the experience of driving it more pleasurable by isolating the driver from those extraneous sensations which were unnecessary or undesirable.

Springs in general play a more common role in advertising of the period than we may be accustomed to today. And not only those used for chassis protection but also those used in the interior spaces of the vehicle. The Overland Company wants it to be known that their sedans feature "separately encased" spiral springs which are "air cushioned and checked against rebound [...] smaller but more numerous than is usual and you sink into your seat comfortably instead of perching on top of it" (Overland, 1917, p. 96). Once again, technology and design are intended to control sensations and experiences by making the seat invisible rather than having the physical sensation of sitting being kept constantly in an immediate and unpleasant awareness.

Insulating

One especially important perceived benefit to being able to drive a car in this period is the protection many automobiles could afford their drivers from the elements of nature that lash at the pedestrian on the street. Air conditioning and heating systems may not yet have been present for the average driver but climate control, or at least climate protection, was still valued. Notes are made in advertising materials as to when a car features an "enclosed" chassis and the ability this provides to separate oneself from the weather. As we see in Figure 4 the Kissel Kar chooses to advertise itself

Figure 4. The All-Year Car. Kissel Kar (1917, March). Adding Six Months To the Motorist's Calendar. [Advertisement]. Vanity Fair, 95.

as the "All-Year Car" with its removable top that "adds six months to the motorist's calendar". The ad features a calendar complete with depictions of the car in each of the twelve months in which we see a family out for a peaceful countryside drive on a pleasant and sunny July day in an open-topped car, while in December the top is back on and protecting the car's occupants from an icy winter storm on a city street.

The emphasis in this Kissel Kar ad is very much on the practicality of the vehicle. The words and concepts which are bolded within the text of the ad are those which point towards flexibility, e.g. "**adding six months to your motoring calendar.** You possess **both** in the ALL-YEAR Car – the **highest developed convertible car** - **practical** for **every** day in **every** month". For the promoters of the Kissel Kar, technology is about facilitating the possible. While it might not be capable of taking control of the drive from the driver, it is capable of granting the driver control over when to drive, including in seasons and weather conditions in which owners of others vehicles might be incapable or unwilling to venture forth. In this way technology is still something meant to provide the freedom to direct attention and concerns elsewhere, only in this particular case it is also a freedom that is easy to take for granted today in which essentially all cars are all-weather cars in at least some sense.

Indeed, many automotive advertisements of the period have a seasonal focus that is by comparison often lacking in contemporary automotive ads. Though, again, this is not for the sake of highlighting performance, for instance how the car grips a slick road, but as in the case of the Kissel Kar to emphasize the controlled and comfortable environment within the vehicle. A world in which a driver possesses the ability to manage and regulate, through the design and incorporated technology of their car, just how many sensations, and of what sort, they wish to allow into their vehicle is idealized. And the ability to choose whether to insulate oneself from the outside does certainly introduce a great convenience to driving. The greater the degree of control over the internal climate of the vehicle means one can pay significantly less attention to the outside environment when deciding whether to drive or not. Or put another way, the materiality – and the flexibility of the material design – permits a number of previous concerns relating to whether it is possible to drive in a given weather

situation or not to be eliminated, or at least minimized. Bearing in mind that practices are never static but are rather changed and modified through usage over time (Sahakian & Wilhite, 2013, p. 27) we can here see one shift in the ongoing practices of driving. Some capacity to engage in "all-weather" driving opens new locations and temporal periods in which driving becomes feasible while at the same time mandating an acquisition and formation of new practices around possessing the capacity to drive in such conditions safely.

And the new practices which must be learned and engaged with can at times prove easier in conception than practice. The somewhat involved process of attaching and detaching a large removable top is one which for some must have been more suited for seasonal rather than daily weather changes. It is not difficult to imagine a situation in which it would seem a considerably simpler proposition to find an alternative means of transportation, or just to stay home, than to wrestle with setting up the roof of the car for a single short drive. Both then and today all-weather driving, or in the case of the Kissel Kar "all year" driving, exists as something of an ideal rather than an absolute reality. There is always a break point at which it is not desirable, or even possible, to drive the car.

But to be able to control on some level a driver's exposure to the elements permits driving to take on new forms, expectations, and characters beyond just transport from points A to B. As the Kissel Kar advertisement in Figure 4 shows a driver can treat a drive as a form of entertainment and take a summer trip through the countryside with their family in order to experience the sun and fresh air and to be as intimately connected to the world passing by as possible. Or the car can be driven as a space apart from the world, shielded from the sleet, snow, and wind to enable a commuter or shopper to show up at their destination as though nothing is amiss.

In this way the car can become in some sense a mobile extension of the home. It is an interior and private space, in which a driver can sit with their family in relative comfort on seats which often resembled the sofa which might be found in their home's front parlor, while at the same time actively moving through the exterior and public spaces of their community. In this way the car permitted an expansion of the sphere of the private and familial into realms which had previously been experienced as public.

Figure 5. Willys' Sedan is not scared of the weather. Willys-Overland Company (1917, January). Willys Knight Touring Sedan – it laughs at changing seasons [Advertisement]. *Vanity Fair*, 104.

The Willys Knight Touring Sedan promises in the advertisement in Figure 5 that it "laughs at changing seasons. Let the cold winds blow – the dust fly – the rain pour – the blizzard do its worst. This is a Closed Car – a snug weather-tight Sedan". And not only does it insulate and protect its driver from the elements but it also saves them from unwelcome mechanical sounds in which there's nothing "to mar your delight at being able to shut yourself up in this car – its motor and gears are so quiet that they are scarcely audible. Silence is golden in any car – it is a delight of priceless worth". Images of power through loud motors and screeching tires are nowhere to be seen here.

This ideal of being able to insulate oneself from the weather, and the space outside the car in general, which is highlighted so prominently in the Kissel Kar and Willys advertisements in Figures 4 and 5, represents an innovation that introduces an understanding of comfort to vehicles that is still significant for drivers today – even if perhaps less remarked upon now due to its being taken mostly for granted. This ideal of comfort in an automobile comes not just through aspects such as having a comfortable seat made with good material, or not being bumped around by bad shocks, but also by way of being shaded from the sun, protected from the rain, and placed safely away from the bulk of the abundant noise and exhaust of the road. Although in the right conditions a closer connection to the outside world might be enjoyable for some, perhaps on one of the warm summer days with a Kissel Kar as depicted in Figure 4, it is still important to have the means to insulate when it is so desired.

While it is easy to view this sort of insulation from exposure to the unwanted as a rather straightforward thing in the modern car, it was in fact the result of a very costly and deliberate effort by automotive engineers of the period to control and alter the sensorial intake of drivers (Mom, 2014). As mentioned in the previous chapter, Gijs Mom (ibid.) attributes this to the birth of the family touring car, in that once the car became the cheapest means to take a family trip, by around 1914, it created a demand for a car that could take a nuclear family to campsites, parks, and beaches for a holiday in some comfort.

In seeking to meet this demand engineers were working to preserve a delicate balancing act between those values which they believed consumers demanded, namely a combination of performance and comfort, while still resisting anything which might increase the price of the vehicle to a point that was too high to sell. The ostensible purpose of controlling sounds and other sensations was to isolate the drive from unnecessary or unwanted experiences in order to free the driver and passengers to enjoy the view, or, as Mom (ibid.) refers to it, "allowing vision to become a 'tourist gaze'" (p. 316). In a way this also means making a drive a more passive experience. To be able to gaze is to feel comfortable with paying attention to things besides the road.

However, this isolation was a partial one of utilizing technology and engineering to engage in a process of smoothing, controlling, and

automating which sensations would be allowed. Complete isolation was unfeasible for manufacturers and undesirable for drivers. The balancing act was one of, for instance, letting in just enough engine sound to make the drive still feel as though it was something of an adventure without allowing so much as to detract from the experience (ibid., p. 315). This shows that drivers had already embodied a sense of how a car was supposed to sound and that different engine sounds and volumes could convey different meanings to a driver. It also shows that engineers could attempt to control and automate sound in order to reorient and guide how a drive was meant to be experienced and embodied by a driver.

In doing so, it also promoted the idea that the ideal drive was a frictionless one. Cars were supposed to float and purr. They were also supposed to look solid but perform as though light. To be frictionless is also to be capable of operating in a manner that can go unnoticed. A loud and noisy car might be uncomfortable, but a completely silent one could feel disconcerting as the wind whistles by. A humming engine is reassuring but also easily ignored.

In addition to controlling insulation from the environment external to the car, technology was also introduced in order to actively enhance the internal environment. For example, by means of interior lighting which, when coupled with an enclosed body, provides a sense of protection of the driver and passengers from not only the weather but also the dark of night. Cars of the period make a point to state when they possess an interior light which can illuminate the car when desired.

And the more luxury a consumer was willing and able to buy into, the greater the flexibility they could have in choosing what their car might be able to be beyond a machine for transportation. One period photo from an automotive salon seen in Figure 6 shows that the interior of a Holbrook luxury car comes complete with side lighting, "Chinese" decoration in the upholstery, and even a Dictaphone – a type of early dictation machine - presumably to aid the busy businessman to finish his work on a commute. In this way design and technology could be employed to not only take the businessman to his office but could also be utilized to convert the vehicle itself into a surrogate office, blurring the boundaries between commuting and working. In a similar manner to the much later introduction of the

car phone, the idea of automation "freeing" a commuter to focus on work instead of their drive is not something so much radically pioneered by self-driving cars today as much as it is an evolution of some previously established experiences and expectations.

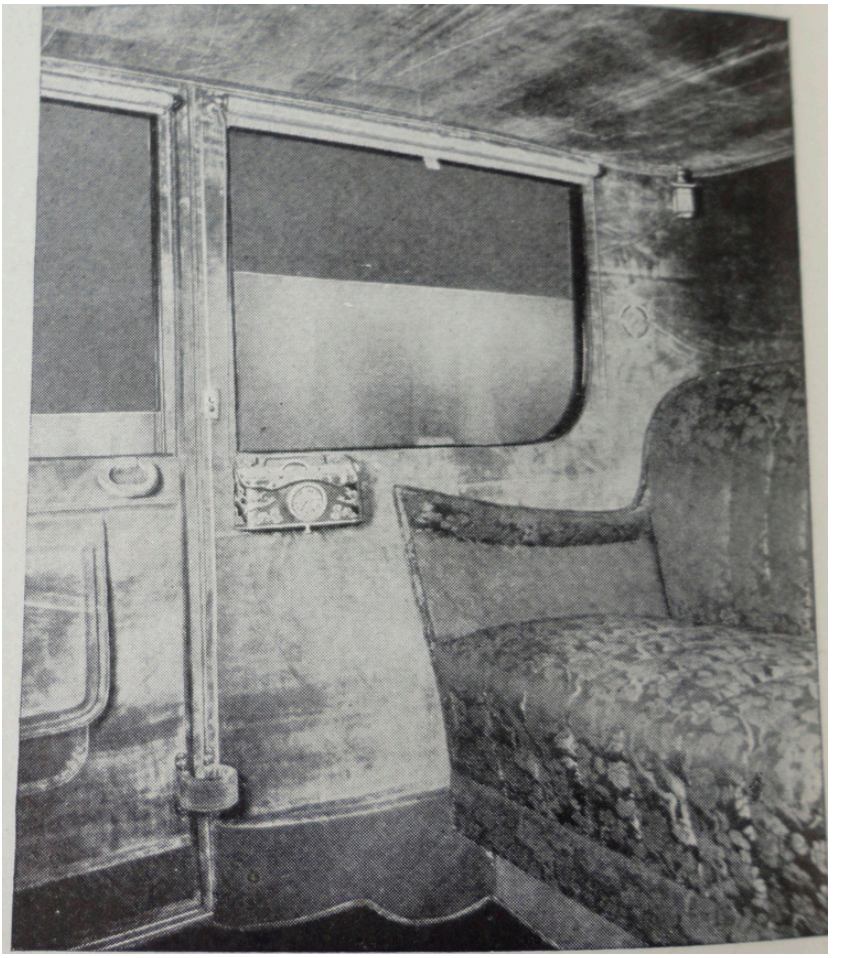

Figure 6. Interior of a 1917 Holbrook with Dictaphone in box to the right of the door. Old Ideas In New Forms (1917, March) [Article]. *Vanity Fair*, 108.

Experiencing a Drive

The ability of technology to isolate drivers, and to turn the car into something representing more than simply a mode of transport, does not mean, however, that there was no valuation placed on driving providing a "fun" experience. As today, there could exist a sense of excitement associated with the high-performance vehicles of the time. For instance, the concept and popularity of automotive racing had evolved almost simultaneously with the commercial introduction of automobiles. By 1915 the still-famous Indianapolis Motor Speedway had already been in operation for six years.

One advertisement also hints at the excitement of driving in a quick mention that while "mother and daughter cannot ask for more beauty, luxury or social prestige, son cannot ask for more power, speed and thoroughbrededness" (National Motor Car, 1917, p. 109). Dad is just supposed to appreciate that it is affordable. The expectation was established, as it often still is, that a strong desire to experience a sense of controlled danger from a vehicle, the kick of a powerful acceleration, or the squeal of tires against the road, is one most appreciated by, or at least meant to be appreciated by, those who are both young and male.

However, the embodied skill of driving in this period, whether perceived as enjoyable or otherwise, involved keeping a closer physical connection to the car than we may be familiar with today. Automated technologies of the period were quite limited by contemporary standards. Many of the driving technologies that are seen as basic today in facilitating a drive, such as traction assist or antilock brakes, were unheard of or unavailable at the time and while prototypical power steering systems had been patented, they were not yet present in production automobiles.

One difference of this vein that the cars of the 1910s had from today was, as mentioned earlier, the steps required in order to start them. Some cars were beginning to possess electric starter motors for engine ignition but many, including the Model T, still relied on hand cranks until around 1920. Hand-cranking an automobile involves undertaking a sequence of steps that would be entirely unfamiliar to all but a few specialist drivers today, ranging from raising a spark lever to retard the spark, to adjusting the engine mixture for the proper conditions. And the act of cranking itself involved gripping

the crank in a particular manner in order to avoid injuries caused by the engine kicking back rather than starting as expected. Such an event could lead to a broken arm, and the act of hand cranking was considered a primary injury risk in early cars (Cadillac, 2012, para. 3). An even worse injury could result from failing to ensure that the vehicle was properly secured during a crank start which could lead to a forward lurch as the motor started, trapping the driver under their vehicle (Elias, 2008, para. 1).

Another challenge would have been the lack of development of the road infrastructure as compared to the widespread highway systems which are so prevalent today. As an example, the first North American transcontinental car trip, undertaken by H. Nelson Jackson and Sewall K. Crocker from San Francisco to New York in 1903 took 63 days and involved a great deal of off-road driving (McConnell, 2000, pp. 59-95). Very little had improved by 1919 when the United States Army Transcontinental Motor Convoy, including the future president Dwight Eisenhower, took 62 days at an average speed of 6 mph (9.7 km/h) to finish a comparable journey amidst numerous injuries and mechanical breakdowns (The National Archives, n.d.). In addition to this challenge presented by the primitive roads a long-distance driver would also likely face the further challenge that many cars of the time could have become almost inoperable in heavy rain, even if protected from the elements. Wiper systems, if present, tended to be manually operated. Sometimes, no system was present at all, necessitating a market for separate hand-held wipers which could be run back and forth against the windshield.

But one similarity with today was that the experience of driving was a social one in that it was shared with passengers, pedestrians, other vehicles on the road, and so forth. While the social role the car would play would evolve over time, it was already becoming established that a car was something which was meant to facilitate a social life. The phenomenon of the family touring car was representative of a shift in the way in which cars were viewed in that the car was already more than just a provider of automobility. As the widespread availability of cars increased, values such as social status and class were increasingly being differentiated through both the type of vehicle driven and how it was driven, as we saw earlier. When individuals of all sorts have a relatively easy access to a car, simply owning a car is no longer in itself so significant.

However, as we will see in the next section automobility could easily be perceived as posing a moral threat when it was afforded to the "wrong" sort of person. But this threat could be seen as being mitigated somewhat by treating driving as a social activity. While there are exceptions, it was often the case that the visual depictions of driving in the period involved families out for a drive together, or in the case of a luxury vehicle perhaps a well-off owner who has a chauffeur to drive them about.

A Social Threat?

An article by George S. Chappell (1917) titled *Removing the Motes from Motors: A bill to standardize the social side of automobiling* might be written in a slightly tongue-in-cheek manner as evidenced by statements such as "the control and regulation of automobiles to-day touches every man, - or comes so near touching him that he has almost cause for a law-suit" (p. 63). But its interest here is in its observation that not only is driving a social activity but that there was a tendency to view solitary driving as an activity with an inherent, and significant, danger. This danger was not necessarily one to the safety of drivers themselves but rather to the very fabric of society itself: the fear of the solo driver as an idle, and potentially menacing, drifter. As the author "argues" in a playful passage:

> "Remember, gentlemen, that the automobile is essentially social and rests on that fundamental social unit, the family. Of course a man may take a spin in the Park or even a little dash to Long Beach without being accompanied by any near female relatives but one who goes on any extended excursion or tour, sans famille, is a disgrace to American manhood and a menace to their community" (ibid., p. 63).

Whether or not Chappell believes this himself, or is just mocking those who do, it speaks to the fact that there were many who very readily saw a male driving alone to nowhere in particular as a moral threat - and a moral threat that tended to come in the form of a sexual threat. The enclosed, private, and mobile nature of the car has long been feared as the perfect place for working-class teenage boys to spirit away promiscuous young girls (O'Dell, 1997). It is a space which the potentially dangerous single

young male, and not the parents of respectable girls, are in control of. It is also a means by which a father can simply abandon his family. While divorce may have still carried a social stigma, the rates of divorce had already more than doubled in the United States from 1890 when they stood at 3.0 per every 1,000 marriages to 7.7 per every 1,000 by 1920 (United States Department of Health, Education, & Welfare, 1973).

Contrasted with this threat of the unattached man is the statement that "a tour is essentially a family affair. It is one of the most intimate associations of married life. Is there anything more touching than the picture of husband and wife pouring over the blue-book and the road-map together, planning their first tour?" (Chappell, 1917, p. 63) only later in the piece to note that if a driver has ever taken a tour then they know that:

> "The decision which road to take when you arrive at any fork or four-corners is one of the most terrific import. I have known families to be hopelessly estranged and broken up by it. It seems to be one of these things upon which husband and wife can never agree, like 'what is the difference between exhilaration or intoxication?'" (ibid., p. 116).

The idea of the car as having a potential to be both a facilitator and destructor of family life points again to the fact that to drive a car was already to do more than just move about. The smoothing of the driving experience through means such as facilitating "all-year" driving and filtering out disruptive and unpleasant sensations freed the car to become a place where social bonds could be strengthened or broken down. Drivers might have the opportunity to think, plot, or engage in unsavory things while moving in private comfort at will just as families might have the chance to bond over lively conversations while on a Sunday trip together.

Looking Ahead

A general impression received from looking at what was written about cars and driving in the America of the 1910s is that the car had entered a period of widespread knowledge and familiarity, at least within urban America. What had perhaps not yet fully developed was a sense of just what place

society had for the automobile as motoring laws, uniformity of said laws, licensing of drivers, infrastructural development, urban planning, and the like had not yet fully caught up to the wave of new cars hitting the streets. This might also be conceptualized as a compression of space and a destabilization of geography. With a car and a road map, an individual could set off into what had been for all intents and purposes foreign and unfamiliar lands to them. This freedom introduced a new potential source of friction with fears of destabilized families, overly independent women, and the moral corruption of young people.

But prior to the Second World War new aspects of what the car could do for society were already being dreamed up. This was perhaps most famously represented, in miniature form, by visionary designer Norman Bel Geddes' *Futurama* at the 1939 World's Fair in New York. The *Futurama*, sponsored by General Motors, was intended to present to visitors what the world several decades ahead might have in store. Spectators rode on a conveyor-belt, airplane-style, above and around a vast detailed model of cities and countryside in miniature, comprised of millions of modeled buildings, trees, and cars (Marchand, 1995, p. 110).

The *Futurama* quickly became one of the most visited and remarked upon displays at the Fair, seeing over 30,000 visitors a day who all got to witness, with great interest, its utopic depiction of everyday life in a near-future America. This vision was one without friction all thanks to the automobile and a world built to accommodate it (Henthorn, 2006, p. 49). Instead of the urban decay that had become associated with the cities of the time, especially in light of the Great Depression, the landscape was one of streamlined and sanitized order and progress brought about through corporate, rather than government, led technological progress in automation.

Bel Geddes' model was of a car-centric city in which wide superhighways radiated out to expansive suburban bedroom communities, which presaged the explosive suburban growth of postwar America and the birth of the Eisenhower-era American highway system (Gelernter, 1995). Instead of traffic jams and narrow dangerous roads, a driver was to whisk along in unimpeded safety. Multiple lanes kept traffic flowing freely while radio control and electronically regulated street lighting provided safety

(Marchand, 1995). Or, put another way, safety and efficiency were possible by minimizing the role of the human driver in favor of technological advancement and new forms of automation. And this fast, efficient, and safe commute brought about through careful planning and utilization of cutting-edge technology meant easy access to a more salubrious and comfortable life outside what would otherwise be the cramped and crowded cities. It was a world in which both society as a whole, as well as the corporation, could benefit together.

Bel Geddes' vision would be put on hold by the outbreak of the Second World War, a period in which consumer automotive industries all but ceased car production in both Europe and America in order to retool and redirect efforts to meet the military demands of the first considerably mechanized war of tanks, trucks, and aircraft. But the conclusion of the war saw an America now fully-recovered from the Great Depression and at a level of industrial power and prosperity it had not yet seen, while Western Europe began its own path to postwar recovery with the aid of Marshall-plan assistance for the rebuilding of a war-scarred industrial base.

So far in this chapter we have seen how the 1910s saw the widespread introduction of the automobile across social lines and the first encounters for many individuals with the car after a lifetime of the horse and train. But of special relevance to this thesis is that this period also witnesses the beginning formations of the ideal of a frictionless automobile. Once the novelty of automobility had instead become mundane, there was an increasing demand for more versatile cars and a need for manufacturers to find ways to distinguish themselves. As the opportunity to drive cars became more prevalent across a wide segment of society, including segments that might be expected to be unskilled in mechanical matters, the onus for a more friction free drive was placed on the engineers rather than the drivers. This still did not exclude the possibility, however, of a young single woman or man with access to a car from being seen as a potential moral threat.

The smoothing away of automotive frictions through technology could take multiple forms. Springs and carefully designed motors were meant to provide a comfortable and quiet drive that isolated a driver, and their family, from the discomforts of the world outside the car while at the same

time not so isolating them that it would feel disconcerting. In doing so, the car also afforded an expansion of the private sphere into what were once the almost exclusively public spaces of the street. And special designs for all-weather driving and electric lighting could enable a driver to, ideally, travel both whenever and wherever they wanted, easing the frictions that could be brought on by the changing time of day and seasons of the year.

The technology of the time could not yet, however, assume control of many of the functions we take for granted today, mandating a closer physical connection to the car than we might be used to today. Motors might have to be hand cranked, at some risk of injury, while a windshield wiper might consist of a hand-held scraper. But what had become established was an idea that the car was expected to become more than a passive tool. This was partly a result of recognition, even at the time, that the automobile was changing society in ways many other technologies could not, as evidenced by the concerns over the potentially serious social menace of young single drivers. But more fundamentally it was through the creation of a new and unique space within the vehicle.

As mentioned, this was increasingly becoming an enclosed all-weather space which had been smoothed and regulated through the orchestration of sensorial experience by engineers. As drivers and the car industry together created an expectation of what a car was supposed to be and how a drive was supposed to feel, the door was opened towards finding new ways to smooth the drive further. This is indicative of the dynamic interplay which exists not only in the creation of space but between space and practice as well. The conceived space of designers and engineers made material through the car could be, and was, used by drivers in ways which then further developed the understanding of the car and driving in society. For example, the ability to drive at greater distances and with greater reliability in a wider range of weather conditions permitted and facilitated the ability for drivers to use their vehicles in ways which benefited their own lives and interests; for instance in the production and maintenance of family through the weekend family drive. This in turn presented a need for designers to find new ways to differentiate their vehicles by better adapting them to the ways in which they were being used and the values that consumers had placed on them which then led to yet further changes

in design and technology. It also presented opportunities to market and sell more cars and therefore encouraged this continuous process of innovation and evolution of technology and design.

That this could happen at all is a result of the car coming to be identifiable as a unique space. Privacy, smoothing, and a relatively all-weather freedom of movement meant the car could become a sort of space which was perceived and lived in a manner different from the trolley, train, or horse. And as a unique space it was able to link in with new sets of practices and values which went well beyond the original conception and usage of the automobile through a process of incremental change. This process of change is perhaps best illustrated by looking at what cars had become during our second significant period of investigation in this chapter where technology and design had facilitated the introduction of new forms of automation to the practice of driving.

Push-Button Rocketing

By the postwar period the explosion in the number of new automobiles being put on the road led to a period in which aesthetics became a crucial concern for automotive manufacturers. Driving a car could, at least in some sense, be said to be just as much about how one felt in a car as how the car physically operated and the mobility it permitted. This is not to say, however, that aesthetics played no role at all previously, only that it had generally been the case that a focus on aesthetics in car design was seen as being for luxury vehicles while the car of the "working man" was primarily meant to be affordable rather than "stylish" (Gartman, 1994a, pp. 37-38). For example, while the Model T originally came with a choice of colors for consumers, by 1914 it was only available in black once Henry Ford had determined that this would simplify production and reduce costs. Color choice on the Model T was not offered again until after 1925 when it was supposed to help raise interest in what was by then a dying model.

The genesis of this focus on a design-centered approach might be said to have been brought on by General Motors' (GM) Alfred Sloan who by the 1920s had sought to differentiate GM's cars in what was then a challenging market due both to a general saturation of cars as well as a

recognition that GM quite simply would not be able to compete on equal terms with Ford on the price of their vehicles alone. Instead, they chose to seek to define themselves by focusing on style – and not merely a single unique design but rather an annually changing style which could help to stimulate demand in an automotive market that by this point in time had the capacity to produce more vehicles than could actually be sold. This permitted the development and implementation of planned obsolescence. After all, how else could one feel compelled to purchase a new automobile if an old automobile was still perfectly functional and each year's new line of cars were being rolled out without significant changes (ibid., p. 72)?

In the postwar period this line of thinking came to be championed by Sloan's protégé Harley Earl, who had been his head of design at GM (Gartman, 1994b). Now selling a car was meant to be about more than just meeting a demand for efficiency, comfort, performance, and the like. It was about meeting, or perhaps even better creating, dreams and fantasies in what Gartman (1994a) calls the "postwar dream machines" (p. 151). In this way a car was also able to fit in as a part of the techno-utopic visions that had already become so prevalent (Bodén, 2018). In the United States this was a time that appeared full of wondrous, if not occasionally frightening, promise through the progress of technology epitomized by nuclear power, Sputnik, and the futuristic images of robots and flying cars idealized in the Jetsons cartoons of the early 1960s.

But this was also a period in which the mobility afforded by the car also took on a new importance. The 1950s began to see the beginning of multi-car families on a large scale as a quarter of the American population began moving out of the cities and into the rapidly expanding suburbs (Rae, 1965). As the rockabilly musician Dale Hawkins sang in 1958, the future for a young man was "A house, a car, and a wedding ring" (Lordan, J., 1958, track A). Increasingly, automobility was becoming not merely a convenience but a necessity.

In this sense driving was in itself not just a means of transportation or a lifestyle facilitator but rather it was being both shaped by as well as actively shaping the world in which people were living. The American landscape rapidly became adapted to the car with drive-in theaters, diners, motels, roadside attractions, and suburban shopping centers beginning to

supplement, and in some cases replace, the urban centralization of department stores and other places of shopping and entertainment. This reshaping of landscapes at the time was not an exclusively American phenomenon either. The glamorization of the Mediterranean coast through popular movies of the era, coupled with increasing rates of car ownership in an economically recovering Europe, meant new places of tourism were also being developed in locations such as Spain's Costa Brava that were now accessible to Western European tourists traveling south on holiday by car (Cirer-Costa, 2016). And these new centers of residence, business, and leisure became largely dependent on the automobile for access, which in turn further encouraged the ubiquity and usage of the car.

Significantly, the postwar period was also the era in which many of the automated driving technologies which we today take for granted were first introduced or popularized. Rapid growth in the rates of car ownership, and in the increasing importance of car-facilitated mobility to the growing suburbs, meant that automotive manufacturers had to more than ever create vehicles which could sell favorably among a wide consumer base. Technologies of convenience and safety were one such means to do so. Of course, as has been seen earlier, this does not mean that other forms of automation through technology and design did not yet already exist in driving. The process of the development and introduction of automotive technologies had been a continuous one. But what had changed was the way in which the forms and discussions of automation took place. As mentioned earlier, the word "automation" itself did not enter popular language until 1948 but, once it had, it held enough resonance to stick as a now common word in everyday language.

The Frictionless Future

If the postwar car was a dream machine, then the dream was one which included an ideal of a frictionless future through automation. This center staging of automation is evident in what GM liked to call "push button driving". "How do you drive a magic carpet?" A little girl asks us in a 1956 Dodge television advertisement. "You drive it with a wish!" "How do you drive a magic car?" "You drive it with a touch […] you just push and go!" (US

Auto Industry, 2011). Power windows and steering, signal-seeking radios, cruise control, and other such technologies promised an easier, smoother, almost friction-free drive. Automation, and the idea of handing over more of what were once manually controlled aspects of driving from the car to the person, became a widespread technological reality for many drivers.

Automatic transmission was one significant example to come out of this development. The first mass-produced automatic transmission system was GM's "Hydra-Matic Drive", which was first sold as an option in new Oldsmobile and Cadillac vehicles just prior to the American involvement in the Second World War. Once production of consumer vehicles was resumed at the conclusion of the war, the Hydra-Matic began to expand across multiple brands of the GM line and by 1952 over two million Hydra-Matic transmissions had been produced for their Oldsmobiles, Cadillacs, and Pontiacs (Severson, 2010).

The 1948 Oldsmobile advertisement seen in Figure 7 is typical of the way in which Hydra-Matic Drive was being marketed. In this ad, and others like it, two points immediately stand out. Firstly, in purchasing a Hydra-Matic equipped car one is buying into the future. We are, for instance, explicitly told the system is "still the newest thing in driving" but it is also visible in the choice of imagery. The Hydra-Matic equipped Oldsmobile is portrayed as putting its driver "away out ahead" both literally and figuratively. Not only is the driver the proud owner of a cutting-edge technology, but he is clearly pulling far ahead of the cars being left behind on the road as the man and woman on the sidewalk look on admiringly while caught in a gust of wind.

Secondly, every usage of the word "automatic" is emphasized in the ad. We first encounter the word underlined at top, and then within the brief text itself it is mentioned three times, each time italicized and standing apart from the sentence which precedes it. Automation, to the Oldsmobile Hydra-Matic marketers, is the future. And it is clearly also a frictionless future. The driver "glides out ahead" and shifts gears effortlessly. Nothing stands in his way of moving forwards or slowing his progress. He is, if anything, emblematic of masculine ideals of power, control, and competency (Scharff, 1991) – even if drawing upon technology which ostensibly is assuming some control from him. Instead of a challenging

skill or a boring chore, driving becomes an easy and convenient part of life as one flows in and out of the city. He is also able to visibly demonstrate to the people around him that he possesses the wealth and success to be able to afford the technology that permits him to participate in modernity.

These twin themes of simplicity and convenience, in which it is often taken for granted that the two go hand-in-hand, were almost the sole values emphasized by GM in order to promote their Hydra-Matic Drive. One 1941 advertising film for Oldsmobile identifies and depicts all of the tedious steps that are necessary in order to operate a usual manual transmission automobile by utilizing a woman, sitting in an invisible car seat in a

Figure 7. Hydra-Matic Drive, promising the ability to glide smoothly and automatically at the touch of a toe. Oldsmobile (1948). *Away Out Ahead – Automatically!* [Advertisement]. Retrieved from https://i.pinimg.com/originals/78/fc/73/78fc73dd48d7ad735449889adf036363.jpg.

darkened room, mimicking the physical motions of taking a car from neutral into forward drive (see ennemme, 2008). This is itself a clear example of Virginia Scharff's (1991) observation from earlier in the chapter that technologies of convenience often used women in order to make automated technologies seem more palatable to men, with Scharff's argument being that that the intended message behind the ad is that automatic transmission isn't for the competent male driver, but instead is there to make life easier for his wife (p. 60). At the same time, factors such as the emergence of the suburban "two-car family" (Walsh, 2004, par. 5) made it desirable for developers to attempt to market vehicles which they felt would be both acceptable to and usable for a housewife. The ad tells us:

> "Did you ever realize how many motions it takes to drive a car with a conventional transmission? Watch closely, she's ready to start on her drive. With one hand she steers, the other manipulates the gear shifter. One foot operates the clutch, the other feeds the gas, and there you are. After nineteen distinct manual operations she's finally underway. Not so with Oldsmobile's Hydra-Matic Drive! There's no clutch pedal to push and the usual gear shifter is replaced by this simple direction selector. Just set the selector at drive, then step on the accelerator and you're off. All shifting is automatic. Oldsmobile's Hydra-Matic is simplicity itself!" (ennemme, 2008)

The emphasis on automation is prevalent across Hydra-Matic advertisements of the period both explicitly and otherwise. After all, the driver is not selecting a gear but rather a *direction* on the Hydra-Matic. Set it to forward and away your car will go, while other drivers are still stuck moving through the unnecessary motions and skills of a bygone-era before this wonderful new era of automation. This bygone-era is clearly not one meant to be viewed with a sense of nostalgia. It is portrayed as one in which the steps required to get a car moving introduce a set of frictions that can make driving a chore. "Nineteen distinct manual operations" slow the driver before they can "finally" be underway. Not only does such complexity require some skill and effort to learn and perform, these are skills which are portrayed as antiquated and unnecessary in a new Hydra-Matic facilitated future of automated transmission. One

in which, as Oldsmobile asserts, a Hydra-Matic equipped car can simply "shift itself". Implicit is a continuation of the ideal of a frictionless future through technology. Extra time or energy brought on by ease of operation is to be regarded as a valued luxury which can make driving more enjoyable.

But there can be more involved than just transferring necessary driving actions from multiple physical manipulations of pedals and levers to automated actions triggered by a single button. Where these buttons are to be found in the car also matters. Another selling point for many of the cars implementing a "push-button" style of driving was the simplicity promised by clustering many of the essential controls together. It wasn't enough that you could drive at the push of a button, all those buttons should also be just a fingertip away.

In this we can also see direct comparisons drawn with aircraft of the era, with their design of paneled gauges and controls being at a pilot's easy reach. An ad for the 1961 Cadillac tells us that: "the new crisp lines of the instrument panel combine all of the gauges and dials, including that of the radio, in a single grouping for maximum convenience to the driver", including the Hydra-Matic transmission which "automatically selects the most efficient gear [...] to meet the performance requirements of the driver" with "velvety" and "infinite" smoothness (Cadillac, 1961, pp. 14 & 68).

This is, in many ways, a quite different picture of driving than that presented by the cars of the 1910s. Ideas of comfort and automation through materiality may be seen then as well, but the cars are not themselves presented as being in any way simple or effortless to learn how to drive. In contrast to this the Cadillac has now announced that the previous way to understand instrument panels or driving practices is obsolete. What were once necessary skills of driving are now unnecessary.

The 1958 Oldsmobile follows a similar path by featuring a "functionally compact instrument cluster" which places the "heater, defroster, ventilator and Safety Sentinel controls right at your fingertips" (Oldsmobile, 1957). The symbolism here is significant. By literal definition a sentinel is something which stands on vigilant guard to protect something probably rather valuable and possibly rather helpless. The Oldsmobile can protect its driver from both themselves and other drivers. And the 1957 Chevrolet

Delray is even more explicit in presenting a new era for driving by offering us the ability to "take command behind this trim new 'flight' panel […] control knobs are finger-tip close, set deeply in a cove for added safety and smartness." (Chevrolet, 1957).

And as we can see in Figure 8 the symbolism goes beyond just the verbal. The terminology and design come together to at least attempt to evoke a representational space of an aircraft. At-hand "flight" controls on the inside for the driver/pilot are matched with an external body which calls to mind the new streamlined jet aircraft of the era through the usage of air intakes, smooth lines, recessed wheels, and tail fins. Even if a driver is not truly flying, perhaps they can feel as though they look like they could.

Being able to take command behind a "flight" panel in a car also becomes, yet again, a way to tap into a technologically mediated modernity which has its own set of associated practices. An airplane may not generally

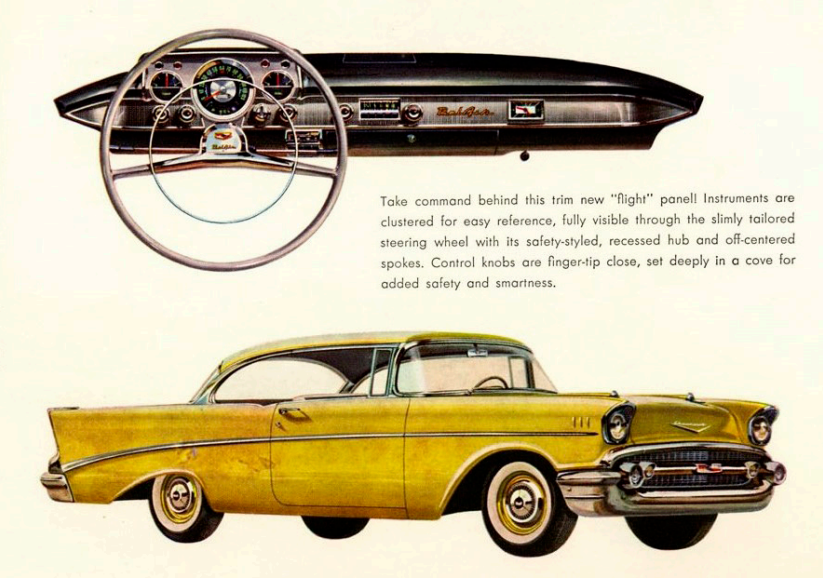

Figure 8. The 1957 Chevrolet Delray's "flight" panel. Chevrolet (1957). *The Delray Club Coupe* [Advertisement]. Retrieved from http://www.oldcarbrochures.com/static/NA/Chevrolet/1957_Chevrolet/1957%20Chevrolet%20Brochure/image9.html.

have been seen by the consumer as a simple thing to operate, especially in an era before heads-up and liquid crystal display-enabled informational streamlining. But what an airplane of the time could do was to place all necessary flight functions at, as the ad says, only a fingertip away from the pilot. Instead of wide, physically exhausting movements driving is intended to become a set of comparatively short, sharp, movements which can be easily learned and performed. And the metaphor of flight also works with the metaphor of being frictionless, as in to soar smoothly through the air with ease. Furthermore, a flight panel can also serve as a high-performance control enhancement rather than be seen as a de-masculinizing replacement for skill. A pilot, after all, could be perceived as an epitome of manliness at the time.

The Frictionless Future Meets Friction

But in spite of the best efforts of car manufacturers of the era to produce and market cars that offered simplified and automatized driving, there were times in which the public reception of these new automobiles was less than stellar. One notorious example is that of the Ford Edsel. The Edsel was introduced by Ford in 1958, in a very expensive roll-out and with much hype, as a revolutionary new car that consumers were invited to come and see for themselves in the Ford showrooms. And the consumers came in large numbers, over 3 million of them, in order to see this new Ford that everyone was talking about.

The problem was that gawking was all most of them were doing. Sales of the Edsel remained far lower than expected and eventually Ford lost over US$250 million on the project, the rough equivalent of US$2 billion at present (Carlson, 2007). Many reasons have been given for the Edsel's failure. For one thing there was the name itself, which carried little meaning for customers as to the design of the vehicle and evoked nothing positive for them. The design was also viewed as problematic, with the front grille in particular becoming a source of mockery with some even feeling it looked like a vagina (Neil, 2017, para. 12). But one specific point of critique was the Teletouch transmission control system installed in the Edsel.

The Edsel was marketed as being as easy to drive as "flipping a light switch" and the Teletouch system was a part of this design. Linguistically, the prefix "tele" refers to something at a distance. The Teletouch shares this prefix with other symbols of simple to operate and electrically powered consumer modernity such as the telephone and the television. Both of these devices are similar in that you don't need to understand how they work; you only need to know how to press the button that operates them. But also, the telephone and television each bring distant voices and images right up to you automatically as if by magic. The name Teletouch can draw on this to evoke something of both convenience and the magical. A driver could have what they needed to change gears both automatically and immediately at hand. The Teletouch was intended by Ford to be a selling point of the Edsel and was marketed as such. It was introduced in a 1957 television ad as follows:

> "Edsel's exclusive new Teletouch drive shifts electrically, at a touch. It's a new idea that puts shifting where it belongs, so you can keep both hands safely at the wheel. And look! You can shift and turn the wheel at the same time while the control remains stationary, which makes the Edsel the world's easiest car to handle" (Feridun Erdal, 2016).

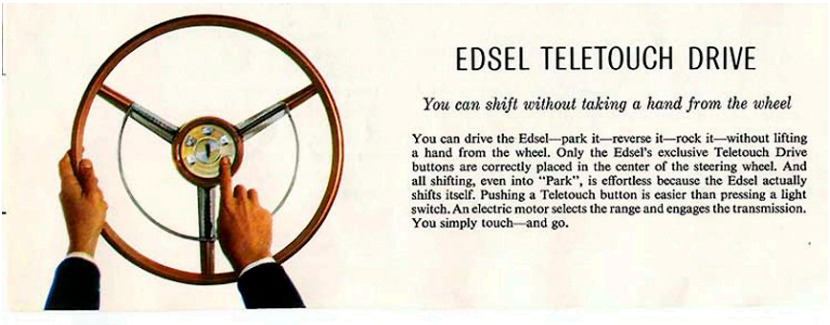

Figure 9. The Edsel's Teletouch transmission system. Ford (1958). *Edsel Teletouch Drive* [Advertisement]. Retrieved from https://www.classiccarstodayonline.com/2017/09/26/alternate-gear-shift-levers-through-the-years/1958-edsel-promo/.

Unfortunately, where Ford felt shifting belonged, in the very center of the steering wheel, was not where many drivers felt shifting belonged. For one thing, despite the marketing slogan, a driver did still have to take a hand off the wheel in order to press a control button as even the ad in Figure 9 demonstrates. But even worse it conflicted with already firmly established driving routines among its operators. Namely, the location of the Teletouch system was precisely where people expected to find a horn – which was actually activated by a dashboard button. This led to situations in which drivers intending to sound their horn to issue a warning ended up hitting their gear shift buttons instead (Sargent, 2014, para. 3). Nor did the concept fit with the way in which people tend to utilize a horn in practice. In a moment of anger or stress one often wants to slam on the horn with a palm or a fist, and not to calmly press a button. To view the Edsel as a space is to see that the engineers had created an at least ostensibly logical conceived space which then failed once it entered use as a lived space and could not take hold in people's lives.

And even in those automotive technological systems which were successfully adopted in this period and remain in use today, it is apparent that a process of acquiring familiarity with the new experiences and sensations provided by the automation could be necessary. One such example is found in the introduction of power steering. The name itself carries a message of ease and convenience. A driver need not be worried about struggling physically at the wheel if the car can apply the force instead. But a level of nervousness by car manufacturers that consumers might be made initially uncomfortable or disoriented by the new sensations brought on by power steering is hinted at in promotional material for the 1953 Chevrolet's steering system:

> "Chevrolet Power Steering lets you retain the 'feel of the road,' for at average driving speeds when little steering effort is normally required, your power steering booster idles and your car steers and feels just as it always has – except for an additional steadiness, a cushion of oil between your hands on the wheel and the shocks and jolts of the road" (Chevrolet, 1953, p. 18).

It appears here that Chevrolet's marketers were concerned that the feel of power steering might be disconcerting to drivers who had thus far driven their entire lives without it. Driving a car without power steering, as anyone who has experienced a loss of their power steering fluid can attest, has a very different feeling to it, particularly at low driving speeds. Even if it is not especially difficult to maintain control of the vehicle, it is still uncomfortably disconcerting to feel a car you have become accustomed to behaving in a particular way to suddenly handle in an altogether quite different manner. Chevrolet was careful here to remind the consumer that in average driving situations of moderate speed their car will not feel any different than before, except smoother with its "cushion of oil".

"Looks Like It's Still Moving!"

Automation, and attempts to give the feeling of driving something belonging to the future, could be conveyed by way of the design of cars of this period as well. The long sweeping lines, characteristic tail-fins, and wrap-around windshields of some 1950s vehicles were thought of as being reminiscent of the jet aircraft and rockets that represented the height of modern technology – an observation manufacturers were eager to promote as we saw earlier with the Chevrolet Delray and its "flight panel". Sometimes this could be made explicit through the naming of the vehicle itself. One such example of this is the 1951 GM Le Sabre concept car which was named after the then state-of-the-art North American F-86 Sabre jet fighter which in that year was battling Soviet-made aircraft over the skies of Korea (Gantz, 2014, p. 148).

Another example of this can be seen in Figure 10 with the advertisement for the 1953 Oldsmobile 88, which promises us the opportunity to glamorously rocket away. Likewise, an ad for the later 1958 Oldsmobile promises "exciting rocket age style" in its "new Rocket Engine car … a magnificent performer in the famous Rocket tradition" (Oldsmobile, 1958). The Kissel Kar and Willys sedans of the 1910s might shield and comfort a driver from the outside world but the 1950s Oldsmobile will blast them straight through it with rocket styling. And to refer to cars as "rockets" can potentially be used to create a more favorable environment

for the introduction of new technologies of automation in the sense that one would naturally expect to find much more of such technology in a rocket ship or a jet fighter than in a car. However, the desirability of possessing such a moniker is also a product of its era and the associated values. Society was already broadly receptive towards ideals of modernist technological advancement and a more convenient day-to-day life through automation. Calling a car of the time "old fashioned" would most likely have made it seem unappealing, even if the exact same phrasing might carry quite positive connotations in other contexts and with other objects.

Figure 10. Making a date with a rocket. Oldsmobile (1953). *Most Glamorous Car to Date!* [Advertisement]. Retrieved from https://ar.pinterest.com/pin/673358581757620721/?lp=true.

The same rocketing messaging can be seen in Figure 11 with the 1956 Chrysler Imperial. The name "Imperial" may not evoke any particular image of dynamic movement by name alone, but where it could succeed is in movement through style. A period television ad for the Imperial has the narrator assure us that "from the rakish flare of its new flight-swept rear fenders right up to its bold, but elegant new front styling the new power-style Chrysler emphasizes the forward look of power in motion." This is soon followed by a shot of a golf course where a pair of golfers stop to gawk at a parked Chrysler to which one of the admirers exclaims "Looks like it's still moving, even when it stops!" (takoma5, 2009).

This type of marketing was a very deliberate strategy undertaken by Chrysler. In the early 1950s they had produced boxy vehicles that might have driven well but did not fit in well with the changing automotive styles, and Chrysler's sales soon lagged behind those of their competitors. By 1952 they had decided to give their automotive stylist Virgil Exner considerable freedom to develop a new styling for the brand. Exner's resultant forward-look design proved to be a great success and pushed Chrysler sales dramatically forward (Gartman, 1994, p. 147).

Figure 11. The 1955 Chrysler Imperial Sedan. alfone45 (2007, August 22). *1955 Imperial Four Door Sedan* [Photograph]. Retrieved from https://commons.wikimedia.org/wiki/File:Imp55rsf.jpg.

The extent of the stylistic change brought on by the new Chrysler design in such a short period of time is readily apparent by comparing the 1950 model of the Chrysler Windsor in Figure 12 with the 1957 model of the same car in Figure 13.

Not only did the new Chryslers move their passengers literally, they also seemingly pushed their passengers forward, both literally and figuratively, towards the future by their forward stance streamlining. In this sense automation could come not only through driver assist devices, but through a focus on design and style as well. The heavy and boxy styling of past years was out as its usage faded in incremental, albeit rapid, steps. Whereas it had already been established that enhanced insulation and material comforts could facilitate the ability to glide along the road, now a car was meant to give the perception that it could do so with so little apparent friction that it could seem as though it was still moving even when at a

Figure 12. Chrysler's 1950 design. Spanish Coches (2010, July 24). 1950 Chrysler Windsor [Photograph]. Retrieved from https://commons.wikimedia.org/wiki/File:1950_Chrysler_Windsor_(4828803362).jpg.

stop. And once it really was moving it was meant to look as though it was slicing rocket-like through the air. If the practice of driving was meant to be friction-free then the appearance of the car might attempt to match the ideal. A sense of flow could be provided to the driver that was grounded not only in the technologies of convenience embedded within the vehicle but also by looking as though the car itself would flow with a simultaneous power and lightness.

One can make an argument, however, as Itai Vardi (2011) does that this represents part of a shift in what the car was that was not altogether positive. While in the 1910s the car was expected to be driven as long as it might last, by the 1950s the concept of planned obsolescence had firmly taken hold. Technologies and designs were expected to change year by year, and consumers were expected to change vehicles at least somewhat regularly to keep up. And both design and cutting-edge automated technologies were more compelling in creating a "dream machine" than less exciting concepts such as safety or economy. Vardi gives the example of the Ford Mustang of the 1960s. While the early prototypes of the vehicle contained an array of

Figure 13. Chrysler's 1957 design. Gjerdingen, G. (2011, June 13). 1957 Chrysler Windsor [Photograph]. Retrieved from https://commons.wikimedia.org/wiki/File:1957_Chrysler_Windsor_(27494313785).jpg.

strong safety features which included dual braking, roll bars, and a collapsible steering shaft, by the time the Mustang went to market in 1964 all of these features had been removed. Vardi's (ibid.) argument is that "decisions to phase out particular proven hazards are led not by the moral imperative of saving lives and preventing injuries, but by aesthetic fashions and the demands of the yearly renewal paradigm" (p. 37). An expectation was born that a car and its capacities were meant to be constantly changing.

Arriving at the Present

So, where has this path of automotive evolution led us to today? In some ways there is a quite direct continuation from the patterns which have emerged over the past century, but there are also new framings of what a car is meant to be and how it should drive. To illustrate this, I will take as an example the promotional website for the Ford Fusion (see Ford, 2019a). The fusion is a mid-size sedan which appears to be marketed as an affordable vehicle for young middle-class drivers with base prices in the United States ranging from US$22,840 to US$34,595 (ibid.) between the several gas and hybrid models. Other cars could have easily been chosen as examples here as well, but the Fusion is fairly representative of the sort of car many of my informants in the coming chapters drove, and indeed one of them drove an earlier model of this exact car.

One key emphasis which has not changed in the way cars are presented is the desire to provide and promote as frictionless a drive as possible. Although the technologies have changed considerably over time, the concerns they address are sometimes the same. The smoothing metaphor still has resonance as the Fusion tells us that it is "designed to deliver a smooth and seamless driving experience – road after winding road" (Ford, 2019b, p. 6). To facilitate this the Fusion is still promoted as being able to insulate its driver and to support all-weather driving, though many aspects of this which might have been highlighted in the 1910s are now mundane to the extent that they have become almost invisible. The presence of windshield wipers, lights, and an enclosed climate-controlled chassis are taken for granted as is the ability to drive comfortably in all twelve months of the year. What is new, however, is the individualization of climates. The

Fusion offers the possibility of heated and cooled front seats which each person can set for themselves. Some models also possess what is referred to as "dual-zone" automatic temperature control. Driver and passenger can set their own desired temperatures, and the terminology implies that instead of sharing a single cabin as before they are now occupying an individual and personalized "zone" of the vehicle. Insulation is now not only from the outside world but also from other subdivisions of the interior as multiple individualized climatic zones can appear within the car.

The cars of today still promote the idea of push-button driving, though perhaps not in the exact form of utopic language of the 1950s. Driving technologies are now "seamless" or "responsive" in the Fusion, but they aren't "magic". And while the cars may be possessed of "cutting-edge" technology and high performance, they don't promise to become a rocket or jet fighter - though the information screens, digital displays, and possibilities for plugging in a heads-up display system can be quite evocative of the cockpits of contemporary aircraft. However, the Fusion does still tells us that "to get moving, just turn the rotary gear shift dial and go" (Ford, 2019b, p. 6), a phrasing that would be entirely at home in the 1950s advertising we saw earlier, even if it is being applied to a new technology.

I've written earlier of Virginia Scharff's (1991) research showing how automotive manufacturers sought to avoid making some driver assist technologies unpalatable to their male driver/consumers by framing them as something they were buying into in order to make life easier for their less driving competent wives. This motif is not used in advertising for the Fusion. A great many of the images have no driver at all present, or perhaps a barely visible driver. When drivers are portrayed, they tend to represent a wider range than solely white men, and one Fusion television advertisement from the mid-2000s features a woman driving her male companion (Pat French, 2019): an image which may have been jarring in 1950s advertisements. But if car companies today do not wish to gender vehicles and driving in the same way as earlier cars, they still remain careful to promote their driver assist technologies in a way which does not outwardly threaten the ideals of competence that can still be attached to conceptions of masculinity in the manner observed by the ethnologist Eddy Nehls (2003).

For example, the Fusion contains a range of driver assist technologies intended to improve the safety of the vehicle. For several years this has included a "blind spot" system and rear-view camera, and in the current model it also includes a "Pre-Collision Assist" feature. These technologies are intended to remotely expand the view of the driver and to make visible potential risks that the driver might either miss or otherwise be unable to see. But they are not being framed as calling into question the skills of the driver as we see in one Fusion advertisement:

> "You never know what might be out there [...] a rollerblader with headphones who's oblivious to everything. The cab driver who's checking out the rollerblader. It's 360 degrees of chaos out there [...] the Ford Fusion will help tell you when it's coming." (Jonathan Froes, 2017)

The problem here isn't you, the driver, but instead all of those other hazards out there beyond your control. Driver assist safety features aren't present because you're looking at your phone and don't see the biker up ahead, or because you reversed your vehicle without properly looking both ways. They are there because the road has distracted rollerbladers and cab drivers. The technology will protect you from the 360 degrees of potential threats you are subjected to on the road. The car is assuming greater control over the driving process than was possible sixty, let alone a hundred, years ago but there is no hint here that it is because the car needs to save you from yourself, rather it is protecting you from "chaos". It is only in the fine print that our potential failures as drivers are brought home, as a footnote to the "Torque Vectoring Control" section in a Fusion brochure reminds us that "it's always possible to lose control of a vehicle due to inappropriate driver input for the conditions" (Ford 2019b, p. 6). In such cases it would appear that the technology has not failed us but rather it is we who have failed the technology.

In the current model of the Fusion the safety features mentioned in the previous ad are incorporated into a system which Ford refers to as "Co-Pilot360 Technology" incorporating a suite of technologies including lane keeping and adaptive cruise control abilities. Ford tells a potential driver that "it's technology that's here to help you" (Ford, 2019c). The usage of

this "co-pilot" metaphor is significant in that it also frames how the technology is meant to be seen. A co-pilot is not the commander of an aircraft, but they are fully qualified to fly it. Automatic emergency braking and lane keeping involve both forming a partnership with and handing an increased degree of control and responsibility to the vehicle/co-pilot from the driver/pilot, but it is carefully framed as only an assistant under the "command" (ibid.) of the driver.

The themes we've seen of insulation and push-button assisted driving technologies represent continuities, albeit in new technological forms, of concepts which the car industry has promoted for some time. But there are also themes present in the promotional material for the Fusion, and other contemporary cars, which were absent in the previous eras we have looked at in this chapter. A readily apparent one is the emphasis on green technologies and eco-friendly driving. A significant, and growing, number of auto manufacturers produce explicitly marketed "green" vehicles in the sense of their being electric or hybrid powered, possessing of eco-friendly driving assist technologies, emphasizing sustainability in the manner in which they are produced, or all of the above, representing something of a green turn in automotive design and marketing (Parekh, 2010). The Fusion fits this mold, being available in both hybrid and plug-in hybrid models and while eco-friendliness is not a dominant theme of the marketing, it is a frequently present concept.

Green technology in the car in many ways can be seen as serving to automate environmentalism. It assumes that its driver will be concerned with minimizing their harm to the environment, though not so concerned that they give up driving altogether. Indeed, it can at times be presented in an almost paradoxical manner as when the advertising tells us "the more efficiently you drive, the more leaves you grow" (Ford, 2019a). In such a portrayal it is as though the practice of driving is itself a productive force for greening the world. But many of the green technologies in the Fusion are intended to enable a driver to drive in an eco-friendlier manner with minimal to no interference in their driving practices. One such option a driver can select is "EcoSelect and EcoCruise" which hand over responsibility to the vehicle to operate itself in a more fuel-efficient manner. And for a driver who wishes to maintain full control of aspects like their

vehicle's acceleration there is a "SmartGauge with EcoGuide" which provides real-time information on how fuel-efficient your own driving is. Drivers can also select an "EcoBoost" engine for their vehicle which is also intended to reduce fuel consumption through better efficiency and the usage of automatic engine stopping and starting when the car is at a prolonged stop. In all of these cases the technologies are intended to blend in with existing practices in a way which provides little to no interference with them. A driver might not have the habit of turning off their engine at a stop themselves, so the car will do it for them while they drive as they usually would.

The greening of the Fusion also provides a clear example of the way in which values shape design and demand. Generally, green technologies improve neither the performance nor the sensory experience of driving a vehicle possessing them. But what they do permit is a linking of the practices of driving and consumption with the practices of eco-friendliness, which many consumers hold a very positive orientation towards. In this way cars can be sold, and drivers can feel their drives are in some sense more pleasant, even if the appearance of the car and the sensory experiences of driving it have little to no difference from those of the non-explicitly eco-friendly vehicle.

A second new theme one encounters in the presentation of cars such as the Fusion is that of the "connected" car, in the sense of being connected to, or offering connections with, other non-automotive technologies of daily life. In this case the car is following a trajectory that can be seen in other forms of technologies of having the initial practices around it expand and become linked into and enmeshed with other practices into something new (Shove, 2003, pp. 176-177). The clearest example of this in the Fusion is the presence of technologies intended to link the car with the mobile phone. The center touchscreen on the Fusion possesses a compatibility with Apple and Android phones which enable the phone's interface to appear on the touchscreen from which one can then access apps and send text messages. The Fusion promises we can "stay connected on the move" (Ford, 2019b, p. 9) and this connection is one through those mobile phone practices and social media networks which previously may have had little or nothing to do with our normal driving practices.

This idea of the connected car also expands beyond the technological. In some advertisements the car is ostensibly placed away from the center of attention while the ad depicts people leading busy and exciting lives. One Fusion television commercial introduces us to the Fusion as:

> "Meet the fuel-efficient Ford Fusion. Along with impeccable style and EcoBoost technology the Fusion also comes with power lunches, [...] and game days, and date nights, and overzealous valets [...]. With so many ands, where will you end up?" (Commercials, 2016)

The car is portrayed here as being a part of, and the facilitator of, an exciting life rather than being the main interest of the driver. This framing can be flipped on its head, however. As the portrayal recognizes that the car is a part of more important things in its owner's life, it seeks to find a way to insert itself into all of them creating a perception that it is meant to be even more central to the owner than ever before. In this way, the connected car finds relevance and new niches by linking itself more directly into present and emerging non-driving practices.

Through the Fusion we can see that the earlier ideals of the insulated drive and the frictionless drive have evolved and taken on new forms, but certainly not disappeared outright. And in the process driving has taken on new metaphors such as the "green drive" and the "connected drive", which still maintain the capacity for planned obsolescence as drivers can continually purchase new cars that better fit the new and valued metaphors. But this process has also led to a shift in the role and expectation of the driver as the car assumes greater control over the drive and in turn creates the capacity for new practices to evolve or for old practices to alter or disappear. Whereas the car may have at one time been conceptualized as something of a tool to be used by a driver for the purpose of mobility, it can today be portrayed as serving as an active partner in the drive, in the form of being our "co-pilot". Later in this thesis we will see, however, that drivers can have a somewhat complicated relationship with their co-pilots by investigating the manner in which some drivers incorporate, or reject, automated technologies in their vehicles into their practices and how these can facilitate, or block, an experience of automated driving.

Concluding Remarks

The 1950s witnessed the real birth in the American automotive industry of an articulated concept of the frictionless future, playing heavily on metaphors of gliding friction-free. In a period of postwar economic expansion in a booming economy, there was a sense that American society was jumping forwards, and the car was reflective of that both literally and figuratively.

The same era also witnessed automotive automation through design. Pioneers such as Harley Earl found a way to differentiate and sell their automobiles through crafting "dream machines" that could convey an impression of dynamic movement through appearance. It was also the era which introduced the ideal of push-button automated driving and saw the introduction of many of the automated technologies which are standard in cars today. Often these technologies came to be embraced by drivers. While a Hydra-Matic automatic transmission might not have literally enabled a driver to glide across the highway without friction, it was still perceived by many consumers as being a welcome assistant for driving and ensured the widespread success of automatic transmission in the United States for the decades to come. Some drivers might have scoffed that automatic transmission was not "real driving", as some still do, but it did fit in with an ideal that driving should take place within a flow in which those physical movements which can comfortably be made unnecessary through technology are eliminated.

There were also some hard lessons to be learned, and not all attempts to craft and sell a frictionless drive were successful. The most notable example of this was the Edsel, which we have seen was a major setback for Ford. One reason, among others, for the poor reception of the Edsel was its Teletouch drive, which attempted to redefine the driving experience by placing many of the necessary transmission controls onto the center of the steering wheel in order to have them readily at hand. However, rather than easing the drive, many drivers found this placement clashed too severely with their already well-established driving practices, while failing to ease their drive in any meaningful way, and thus it was considered both undesirable and disposable.

In the previous chapter mention was made of Schatzki's (2001) argument that practices occur as materially mediated activities. And for a practice to be maintained it must become both routinized and still be perceived as having a use for the practitioner. In the case of the Teletouch it proved impossible, or at least insufficiently embodied, for this to happen. The technology itself could have worked as designed, but because the new way to select gears clashed with what had already become an embodied knowledge of where things such as transmission controls and a horn were expected to be, it meant that the Teletouch was unpopular with drivers. If a person needs to reflect deliberately on how to perform a driving action which previously was sufficiently embodied as to become near invisible, then the technology can fail to be experienced as automated even when technologically speaking it is.

However, in spite of the failure of the Edsel, an ideal remained among manufacturers that in order to compete, a car and its abilities, should change year by year. From the boxy touring cars of the 1910s we see the vehicles of the 1950s mimicking the design of rockets and jet fighters and possessing a suite of new forms of automated push-button technology promising a more friction-free drive. These changes had occurred incrementally over a certain period of time and were encouraged by the increasing usage of planned obsolescence in the sense that while perceptions of cutting-edge automation were being used to facilitate the selling of more cars, they also meant that there was an expectation for new and improved forms of vehicles to replace the old models. In many cases, new designs and technologies came about through a process of co-creation between manufacturers and consumers. We witnessed this earlier with the birth of the family touring car in which the improved comfort and insulation of vehicles permitted enjoyable long-distance car travel, sparking the phenomenon among drivers of the family road trip. Manufacturers would then in turn seek to capitalize on this new type of drive by engineering their future vehicles to fit in with new expectations of good visibility for gazing at the scenery and through the orchestration of how much engine noise could penetrate the interior of the car in order to ensure the drive felt adventurous but not uncomfortable.

This returns us to the question posed at the beginning of the chapter, namely: how has the car developed through time in a manner which facilitates automation? Firstly, and most clearly, automation in vehicles is

not a new concept. While the forms that automation may take have developed and advanced through time, the idea that a car can take control of an action and shape a driver's experience through the usage of technology and design is not a new one.

Secondly, this process of automation is built upon previous advances which have introduced and then sustained bodily understandings of what it means to drive. While new technological advances are often portrayed as being major new developments, they are actually based upon a large amount of previous work not only in already existing technologies but also in establishing conceptions of how it feels to drive, and what it means to drive. For example, engineers of the 1910s were able to introduce the expectation that a car was not just meant to get you somewhere, it was meant to do so in a controlled and comfortable all-weather environment in which the car could permit desired and moderated sensations while keeping out the uncomfortable, enabling a feeling - or at least an idealized image of a feeling - of gliding across the road even when the weather or road itself may not be optimal.

Once the expectation for what a car was supposed to make a drive feel like had been established, and once the technologies of automation had the opportunity to further develop, the cars of the 1950s were then engineered to be able to begin the process of taking over control of a range of tasks from the driver. Automatic transmission and power steering eased the physical effort required to keep a car moving, while forward-swept designs ensured the car seemed as though it was still moving even when stopped. This reflected the ideal that one was now meant to not just feel comfortable on the road, but to rocket down it through dynamic styling paired with automating technologies. At the same time, manufacturers were also careful to frame these technologies in ways which did not call into question the competency of a male driver. This could take the form of indicating that the technology might facilitate an even greater driving prowess, or to imply that the resulting simplified drive was really meant to make life easier on the male driver/consumer's wife. And as automating technology developed in its capacity to control the vehicle, and assume tasks from the driver, manufacturers have also found ways to be able to link into changing social values to create new metaphors for the car, such

as the green car or the connected car we were introduced to earlier in the Ford Fusion. In this way cars can also be seen as both contributing towards, and reflecting the values and aesthetics of, their time. Harley Earl could not have put out a rocket car in the 1920s as such a radical change would simply have felt alien and disorienting. Some changes in automotive design and technology can come quite rapidly, but they come incrementally and are products of both shaping and being shaped by the feedback of their driver/consumers.

These developments have shaped the way in which we experience a drive today. Power steering, anti-lock brakes, or external windshield wipers are not necessarily required in order to drive a car. But the absence or failure of them can lead to a drive feeling instantly wrong and even dangerous for a contemporary driver. This embodiment of automotive automation has been over a century in the making. This is also precisely why a historical perspective is important to understanding how driving has come to be automated today. An archaeology of the car can illustrate that expectations and experiences of automation have unfolded as a process and can provide illustrative examples of what has gone right or wrong in the design and incorporation of new technologies.

As mentioned previously, there are some inherent and significant limitations to understanding the actual lived experience of driving through historical materials. We can, however, see through the usage of stories and advertising what was idealized, or at least thought to be idealized, even if this is not quite the same as physically experiencing the drive in the way that people of the time would have. But what this chapter has intended to show is that the experiences and embodiment of driving have not arisen from a blank slate but are instead shaped through a process of incremental change. And now that it has been shown how this change can occur, I will move to the present-day driver. In the next chapter I will examine how driving can be embodied today and why it is important to examine if we are to understand the automation of contemporary driving.

Chapter 3
On the Road

In the previous chapter we saw how the car developed into something more than just another means of transportation. Design and technology developed in parallel to introduce new ways and expectations for a driver to embody forms of automation and to establish orientations. This chapter will now take up an empirically based study of driving at present in order to see how and in what way driving practices might already be experienced as automated. In doing so it will seek to contribute towards answering the second research question posed in this thesis; namely, in what ways can driving be understood as having become automated at present and what role does the technology of the car play in this? While the previous chapter showed how this process can develop over time on the macro level, this chapter will show how the process is currently experienced by the individual driver.

While sharing an attempt with much existing quantitative research on driving practices to take seriously the micro-practices and specific situations that can comprise a drive, an objective here is to contribute towards filling an existing gap within some research which insufficiently accounts for the cultural context in which driving takes place and the way in which it becomes embodied and experienced by the driver through time. This chapter will argue that this process of embodiment and experience is precisely what permits driving to become automated at present as a corporal and often non-reflexive phenomenon.

In order to understand this phenomenon, the chapter will look at how using a phenomenological approach to investigate the practices of driving might open up a productive and valuable way to understand how and why embodiment can be key to facilitating, and perceiving, an experience

of driving occurring automatically. It will also seek to explain why this perception of automation is useful for a driver. It will do so by utilizing a mixture of the theories of phenomenology and practice which were introduced in Chapter 1 and will also draw upon Erving Goffman's work with symbolic interactionism to further illuminate how culture can shape practice.

It will begin by looking at what this automatic driving is and how the ability to perform it is acquired. We will then turn towards how the materiality of the car itself affects the automation of driving. In doing so I fundamentally agree with Shove and Pantzar's (2005) call for the necessity to materialize social theories of practice. We will see how in the car the connections to materiality through the body and its senses are instrumental towards the capacity to drive automatically. Finally, we will look at how existing forms of automation are incorporated into, or rejected for, driving practices and how they facilitate or hinder the performance of automatic driving.

But first, let us ride-along on a drive with Brian in order to see what an everyday suburban drive in the United States might be like for some drivers.

Driving with Brian

Brian is a male in his mid-30s who has spent his entire life in the Washington, D.C. suburbs. Even from a young age he enjoyed cars and made sure to get his driver's license as soon as he possibly could in high school. His first car was a hand-me-down European diesel from his father, and it was love from first drive. He remembers how impressed his driving instructor was with his driving abilities and Brian still takes great pride in his skill as a driver.

To Brian, a skilled driver is a driver who knows how to handle their machine and is capable of pushing its limits without losing control. I notice later that he possesses an almost uncanny ability to pull into a parking space at a considerable speed, seemingly without fear. He has recognized, however, that he has had near collisions resulting from a loss of control of his vehicle in the past, but it is to be expected when you want to test your vehicle and your skills a little.

Today it is a clear, crisp, and dry February afternoon and Brian is letting me join him on an errand to his place of work to drop off some equipment. Brian now drives a powerful pick-up and it is his pride and joy. It isn't necessarily the easiest sort of vehicle to slip into tight spaces on congested suburban roads, but he wouldn't consider giving it up for a car, even if the gas prices go up again. Driving something so large, with a powerful, loud, engine just feels right to him.

We step up into the cab, an action Brian performs so quickly I miss how he does it while I'm still trying to figure out how I'm supposed to swing into my seat. I drive a small sedan and one wheel on this truck looks about the size of all four of mine. Brian starts the truck and immediately the speakers blast a Grandmaster Flash track on a very heavy bass that he quickly changes to a lower volume so as not to disturb his passenger. His seat, mirrors, and wheel position all appear to be set for how he normally drives. He doesn't touch or even look at any them. No one else is allowed to drive his truck.

His truck has an automatic transmission. Brian says he knows how to drive a manual, but he's never owned one nor does he particularly care to. I never do manage to get what I would consider an explanation as to why. No matter how I try to phrase or rephrase a question on the topic he shrugs it off without much comment. At any rate Brian appears to me to know his truck inside and out. He has already discussed with me at length the modifications and other forms of work he has put into his "baby". They ensure that his truck looks and feels unique to him in a way that other vehicles can't completely duplicate. He is certainly comfortable enough with how his truck handles as evidenced by the fact that the process of throwing it in reverse and backing out of his parking space happens so quickly it may as well be a blur to me.

The second he reaches a 90-degree angle from where he started he turns the knob next to the wheel to "D" and takes off with a heavy acceleration that kicks me back into my seat and lets out a roar from his modified exhaust system. As soon as he reaches the main road, he needs to make a U-turn. His feet change pedals from brake to gas as he spins the wheel hard, keeping his eyes firmly fixed on the face of the driver of another car that looks like it is about to turn in on him. "Fuck you, I have right of way!" he

angrily exclaims to the driver, despite the enclosed cab we sit in, and Brian accelerates hard to make sure the other car won't dare cut in front of him after making its turn. He is right - he does have the right of way.

As soon as he settles into his preferred speed on the road - he tells me he aims for no more than about ten miles an hour over the limit though I note he's going fifteen over at the moment he tells me this - he kicks into a sort of "autopilot". He begins to fiddle with his radio to find a satellite radio station he prefers. He chuckles a little and asks if I want heat while pointing at his control button for the passenger seat warmer. The heat from the vents is already blowing hot, and there's no trace inside the cab of the chilly weather outside, but he wants to be polite. Plus, this is the first vehicle he has owned with seat warmers and the truck is still quite new and feels a little novel. Might as well get his use out of them. While all this is occurring, he is routinely passing cars without comment or seemingly much notice. He sticks to the right lane - only assholes use the left passing lane he tells me - for regular driving. But all the same he refuses to drive behind a slower vehicle if it can be helped and he does make very frequent use of the passing lane to get around them.

The drive is passing pretty routinely and calmly, even if a bit above the speed limit. But there are exceptions to the rule. Occasionally Brian gets stuck behind a slower car in situations in which he has no ability to pass. Each time he becomes instantly annoyed and speaks to the car, exclaiming "c'mon MOVE Toyota!" or whatever other model of car is in front of him, even if the car in front is itself going at or a little above the speed limit. Sometimes Brian will give up waiting and begin to move in closer to the back bumper of the car in front to send a clear message that he wants it to get out of his passing lane immediately.

After a few minutes like this Brian reaches the highway and merges in without issue. It is here that I really start to notice just how much of a rather disconcerting perception I have of feeling like I'm soaring above the road. It seems to be some combination of good shocks, good road conditions, the highest truck cab I've ever sat in, and the high speed. Brian doesn't especially notice anything in this regard, he's been driving trucks for years. But it's a perspective of the road he never wants to lose. He's not paying any attention to his gauges or controls beyond an occasional glance

at the speedometer. Instead, he's scanning the cars around him from quite literally a position above. Occasionally, he'll notice a car he admires and remark at how nice it looks. Sometimes he'll see a driver pull a stupid move, at one point a Hyundai nearly sideswipes another car when it tries to change lanes without looking, and he remarks that its clearly some kind of idiot driving it.

As we get closer to Brian's destination, he gets off the highway and back onto a still sizable road. There isn't much traffic and he's able to maintain a steady fifteen to twenty miles per hour over what seems to be the limit here. In doing so he starts to scan the side of the road for any car he suspects to be a marked, or unmarked, police cruiser. Spotting these police cars appears to me to be as almost a kind of game for Brian. The greater the car is hidden the greater the pride he seems to express at seeing it. He announces that up ahead there is a place where a marked patrol car is often waiting to catch speeders and he begins to slow down accordingly. Sure enough, one is there, and he laughs and announces to me which police station it is out of. As soon as he's put sufficient distance between himself and the police car that it is unlikely he would get pulled over, he applies the gas and quickly accelerates back to his above the limit cruising speed.

After a little bit of what now feels like entirely routine driving Brian asks me if I want to try something fun. He knows a short, narrow, winding road through hilly terrain that is about as close to a rural environment as you will find in the Washington suburbs. I tell him he can take it if he wants and after about a kilometer or two down the road, he reaches it and makes his turn. At this point it becomes very difficult to tell how much attention he is paying to the wheel and pedals, and this is not really the sort of road where I feel like I can strike up a conversation about it. This road demands constant alterations to speed and direction to keep from running off it, yet Brian does seem to know the road well. He wanted to drive it for a reason. The curves may take some skill to handle but his body sways into them. They are now familiar twists and turns that he is feeling through movement and a "gut feeling". The road then finishes in what is the whole reason he wanted to take it: a blind drop in the road off the summit of a steep hill that he briefly accelerates to take at speed. The truck crests the little hilltop and I briefly feel my stomach turn to butterflies in the same sort of sensation

I experience on a roller coaster drop. Brian laughs as this happens though it is unclear to me as to whether he took this road in order to show off his skills to me, or whether he enjoys the sensation himself. Perhaps it is both.

A few more uneventful turns down a few more kilometers of road as the skies begin to darken and we've reached Brian's destination. He pulls into a tight parking space far quicker than on any other drive I can recall experiencing. He explains that the wheel is easier to handle at speed and he knows the space his truck requires at an immediate glance anyways. He switches the transmission knob to park, quickly turns and removes the key from the ignition, flicks off his headlights, and seems to have hit some kind of a button when I wasn't looking that pulls his side mirrors flush against the door windows. Or perhaps it just happens automatically. We swing back out of the cab and I start jotting a few more fieldnotes about what I remembered from what felt like a somewhat remarkable drive for me. "Anything unusual about the drive? Anything in particular you notice?" I ask Brian. "Nah" he replies with a shake of the head.

Of course, many things *did* happen. A wide range of physical actions were performed, choices made, and situations were handled with what seemed like effortless action. So effortless that Brian saw nothing remarkable in any of it. But how does this happen? How is it that a complex activity which ostensibly requires action and focus can be performed as though on autopilot?

Automatic Driving

As a passenger, driving with Brian may have felt unique in the sense that he was a considerably more aggressive driver than any of the other individuals I had the opportunity to ride-along with. But what struck me was that in spite of Brian's undeniable passion for both cars as machines as well as the experience of driving them, he did what seemed like so little actual conscious driving. In interviewing him after the fact there was very little that he could remember about the events that had taken place on our trip. Of course, he had gone through all the motions of driving. In fact, he went through the motions with a remarkable speed and dexterity. But it was very much a practiced dexterity and one which was performed with what appeared to both him and I to be done almost unthinkingly – as if by autopilot.

And Brian was by no means unusual in possessing this ability nor were the other drivers I spent time with blind to the experience of driving without consciously driving. As Angie put it when I asked her if she had ever experienced arriving at a point in her driving route without being fully aware of just how she got there:

> "All the time. All the time! It's scary. Scares me because I get thinking 'Ok where the hell was I for the past two minutes or minute and thirty seconds' or whatever. I find it terrifying, but it does happen. You know you're so busy thinking about whatever it is you're thinking about, the brain just, everything just kind of goes on rote and if it's a road that you've driven ten thousand times your brain kind of shuts out and your body is just doing it by memory." (Interview with Angie, December 21, 2016)

This idea of finding oneself driving through a not fully conscious "memory" was shared by many other informants as well:

> "Well driving, it doesn't require too much because it becomes very... automatic in a way. Like, shifting, changing gears, you don't really think about it, you do it automatically, so it doesn't really take a lot of your brain power. It's more muscle memory I think, yeah." (Interview with Mikael, March 9, 2015)

Although this experience could sometimes be rather disconcerting when contemplated in hindsight, as seen in Angie's reflection, it is nonetheless indicative of the level of comfort which longtime drivers can come to experience in their vehicles within everyday driving situations. This is, however, a comfort bred from skill and knowledge. "Muscle memory" is, after all, not something a driver would be born with. It speaks towards an acquired and familiarized corporal and cultural knowledge of what is required to drive effectively without needing to invest much thought in it.

Often, routinized forms of driving could come to feel as more like a process of information management than one of performing physical movements. At no point did any driver I spoke with claim to experience a need while in their own vehicle to suddenly reflect on exactly how to find

the gas pedal, or how much force they had to apply to their wheel in order to make a turn. Instead, whatever attention they placed on their driving was one of monitoring conditions on the road and observing what other cars and pedestrians might do. Occasionally it might also involve checking gauges for reassurance that everything was functioning normally, that they had enough gas to get to where they were going, and that their sense of speed was correct and they were not placing themselves in too high a risk of getting pulled over by the police. But for the most part driving happened by "feel". In these situations, a regular car can often seem to become an almost literal self-driving car.

This feel of driving also includes a level of communication from the materiality of the car to the driver. This communication occurs through what Michael Polanyi (1967) refers to as "tacit knowledge" in which sensorial experiences are felt and remembered although never easy to reflect upon or articulate. Or, as Polanyi succinctly puts it "we can know more than we can tell" (p. 4). For example, the wheel will feel a particular and familiar way, and the engine will sound a particular and familiar way, when the car is functioning normally and as expected. These familiarized sensations in turn let a driver know that there is no need for any concern, and the resulting sense of ease and flow means that the car is driving without problem while the driver's sense of conscious presence may be elsewhere.

Learning to Drive Automatically

However, as Feldman and Worline (2016) note, practices do not simply appear out of thin air, but instead dynamically unfold, develop, and modify through time (p. 308). This being so, how then might we understand the way in which informants become comfortable to the extent that they came to be able to drive automatically? While driving requires a certain store of knowledge regarding the role and operation of pieces of equipment within the vehicle, the meaning of a range of traffic signs, and the rules of the road, a deep understanding of this knowledge is not sufficient in itself for explaining how people learn to become automatic drivers. After all, many informants felt they had a better recall of some of these aspects of knowledge when they were studying for their driver's licensing examinations

than they do at present. I would argue that the key point is, rather, the deeply embodied knowledge of driving which is acquired over time.

Merleau-Ponty (2012) states that there is a mutual engagement between consciousness, the human body as a perceiving thing, and the world around us that act to help us make sense of our experiences. Furthermore, this same dynamic is crucial for driving in so much as "it is the body which 'understands' in the acquisition of habituality [...] to understand is to experience harmony between what we aim at and what is given, between the intention and the performance – and the body is our anchorage in the world" (p. 144). This is in opposition to a Cartesian dualism which asserts that the mind and body can experience the world separately. It also reflects Merleau-Ponty's argument that actions can occur spontaneously and without the need for deep deliberation (Reynolds, 2004). For example, while Brian was for a time using conscious deliberation in searching his radio for music he wanted to listen to, he later admitted that he felt as though he "wasn't paying attention" to the cars he was passing at high speed at the very same moment.

This point is often made explicit by other informants as well, as can be seen in the earlier quote in which Angie spoke of her brain turning off and her body taking over by memory. Of course, this is not a literal point in that her brain cannot actually switch off. Rather, she is speaking to the manner in which the repeatedly practiced physical motions of driving have become so deeply embodied that they can be performed seemingly without thought. Far from unique to driving, this is a phenomenon that is common to a range of acquired skills which require more than just abstract knowledge. As Drew Leder (1990) writes in *The Absent Body* "A skill is finally and fully learned when something that was once extrinsic, grasped only through explicit rules or examples, now comes to pervade my own corporeality. My arms know how to swim, my mouth can at last speak the language" (p. 31).

This process of learning ostensibly begins at driving school, but in fact it is a lifetime process. Bikes, sleds, and other forms of movement teach a child to understand and apply judgement to skills which will prove necessary for driving such as gauging velocity, distance, and turn radius. It is at driving school that individuals then come to be taught to drive a car "properly" through practices such as maintaining a two-handed grip on

the wheel, obeying all traffic laws, and maintaining a specified gap when following another vehicle. But after a driver gets their license many of these practices come to be altered or forgotten. Experience tends to make a driver comfortable with their ability to understand how much space they need to react to the vehicle in front of them, regardless of whether this distance is in accordance with what they were taught or not. Likewise, drivers find that they do not need two hands on a steering wheel to maintain their course. One person I spoke with likened the experience of driving with their hands wherever they wished on the wheel to learning good sitting posture in school and then slouching once at home because it felt much more natural and comfortable.

It would be a mistake, however, to view driving as drawing solely upon the knowledge of a set of well-practiced rote physical movements of turning a wheel or pressing a pedal. For Merleau-Ponty (2012) habit involves an understanding that the body forms with the world it is interacting with. This includes an ability for the body to adapt to a range of problems and situations presented continually by the surrounding world, and in a manner which is both appropriate to the circumstance and can be performed spontaneously without a need for prior reasoning. In fact, an inability to do so is often a hallmark of those who have suffered some type of injury or illness affecting their cognitive abilities in which they might physically be able to perform some habituated motions but not necessarily those which require an actual understanding of the situation at hand. One such example that can be encountered in Merleau-Ponty's (ibid.) writings is that of a person who has the physical ability to touch a part of their body with their finger yet is unable to follow a command to touch the same part of their body with an object (p. 103). He uses this to demonstrate that the healthy individual is by contrast able to readjust the habitual, or pre-reflexive, body from the actual, or reflexive, body. Hence, if one is told to touch one's ear, a healthy individual has no difficulties in performing the action with their finger or a pen as both movements are felt as analogous.

This is a key point to understanding how an experienced driver comes to obtain the capacity to drive while feeling that their brain is "shut off". A skilled and comfortable driver possesses an ability to not only perform

the physical motions of driving without conscious reflection but can also at the same time understand the situations in which those movements are taking place within. This is contrasted with a novice driver who might possess a tenuous grasp of both the physical motions of driving as well as the sensorial perceptions which might arise on the drive. One person related to me a particularly terrifying moment when he first began driving on his own in which he had approached a T-intersection and was waiting to turn right. As he rolled slowly up to the stop sign, he momentarily forgot which pedal was which and found himself pressing the accelerator pedal rather than the brake and he only narrowly avoided slamming into a car coming towards him on a perpendicular path.

And the situations a driver must be able to understand can also be very dynamic ones which involve skills and understandings beyond the physical manipulations of steering wheels and pedals. In the first chapter I observed that roads are social spaces in which a driver is rarely, if ever, alone. Going a bit deeper into this observation provides an opportunity to illustrate how practices also link into the social, enabling a perception of flowing safely through traffic on busy roads.

A Culture of Merging

A more skilled, but still relatively inexperienced driver could have acquired the confidence to perform the motions of driving without deliberation but still might not possess the capacity to apply them correctly to those situations which may be familiar to more experienced drivers. One example of this emerged through a brief conversation I had with an individual in Sweden who had possessed a license to drive for several years but disliked driving and only did so by borrowing her family's car a few times a year.

While she felt reasonably comfortable driving on the roads in town, she despised highway driving. It was not necessarily the highways themselves, or even the higher speeds involved in driving on them, but rather the process of merging onto them which made her feel so uncomfortable. Sometimes she found herself panicking a little at the sensation of cars approaching at high speed while she was trying to merge at low speed and she had a very difficult time of ascertaining when a gap between cars was sufficient for her

to safely merge and then accelerate to highway speed. On one occasion, she misjudged the distance, made the merge too closely to another car, and had that approaching car angrily follow her bumper closely for a period of time with the driver honking their horn at her. An experience in a similar vein was also encountered by those drivers I interviewed who reflected on their first experiences of driving in ice storms and spoke of accelerating from a stop in the same manner they would on a dry road only to spin out and briefly lose control of their vehicle. In both of these situations the physical motions of driving were in themselves performed correctly, but at the wrong time and maladapted to the situation being presented to them.

As we see there is more to these situations than simply inadequately performing a physical movement. For example, in the case of the informant who was struggling to merge she was also struggling to proficiently follow what could be called a culture of merging which, when correctly understood, can enable the processes involved in the merge to become invisible for the skilled driver. In his research on the rituals which accompany face-to-face encounters between people Erving Goffman (2005) has demonstrated the significance that social face holds for an individual, to the extent that it "can be his most personal possession and the center of his security and pleasure" but that it is "only on loan to him from society; it will be withdrawn unless he conducts himself in a way that is worthy of it" (p. 10). And face-to-face encounters also occur in driving, even if the physical face of the other driver is not visible.

Generally, a driver will regard the cars around them as being operated by competent drivers aware of the rules of the road unless they see evidence to the contrary. This assumption is also significant to the capacity of being able to drive without undue stress in that it enables one to not need to consciously reflect on the behavior of each and every car on the road unless or until they do something out of the ordinary. To be, or at any rate to be perceived as a competent driver is to take a line of not standing out. Within the particular situation of merging the informant interfered with what Goffman (2005, pp. 9-10) would call the "expressive order" of the situation at hand, which is to say the expected course the social interaction should take which allows face to be maintained, by cutting into the lane with an unexpected timing and speed. This in turn forced the car behind to pay

special, and ordinarily unnecessary, attention to her. The result of the situation was a failed social interaction, feelings of anger or loss of face in both drivers, and the inability for either of them to have the practices involved in merges to pass by invisibly.

However, within ordinary circumstances, the skilled, experienced, and comfortable driver possesses both the embodied knowledge of how to drive in a situation, as well as the capacity to quickly understand and adapt to these situations as they occur without seeming even to themselves as requiring any thought. Rather than a frightening experience, Brian's highway merge illustrated in the beginning of this chapter was performed with what seemed to be the absence of effort or concern. One brief look out of the corner of his eye, while already in the process of accelerating his truck, was sufficient for Brian to feel comfortable merging while simultaneously holding a conversation with me. He stated that merges were, for him, "nothing".

But what had appeared to be nothing was in fact a mastery both of the embodied knowledge required to drive with ease as well as of the expressive order of the merge which enabled him to successfully take a line of being a competent driver. It is at this stage that driving becomes, for all practical intents and purposes, automatic in the perception of the drivers themselves; an action which can be performed seemingly without any cognition whatsoever. The question this opens up, however, is how are the knowledge and skills acquired and maintained to where a driver can operate in this manner?

Becoming Skilled

The apparent ease at which many driving practices are performed should not belie the effort that has gone into making them possible. As Richard Sennett (2008) succinctly defines it, "skill is a trained practice" (p. 37). This is to say that while physical or mental attributes conductive to driving might be drawn upon, the skill of driving itself derives from extended and repeated practice. Sennett argues that through the repetitive performance of routines we develop the capacity to both understand and modify our practices. One example of this that he gives is that of the tennis player who, through repeatedly returning practice serves, begins to understand how to shift the

direction the ball is returned when hit in a way which could not otherwise be taught. In the case of Brian, the majority of his daily drives involved what was on the face of it a repetitive experience in that his commutes to and from work, and other common destinations, involve driving the same vehicle along mostly the same familiar roads. Yet none of these drives are ever truly identical in that variations will always occur. Variables such as the weather on any given day or the behavior of the other cars on the road will differ to some degree each time he is on a drive, even if many of these changes happen to pass relatively unnoticed. In constantly encountering these unique driving situations, and in learning to modify his own driving behavior to meet the situations successfully, Brian comes to develop the skill, and consequently the confidence, that enables him to drive without thought.

Importantly, these engagements are not abstract ones but are directly experienced through the senses, whether one is speaking of watching the direction a tennis ball will take as it is hit with slight variations in Sennett's example, or the feel of the vehicle for Brian when he encounters a new driving condition. Experiences of driving over patches of black ice might teach him to be wary of accelerating on a bridge during certain cold periods of the year. Likewise, learning how his truck accelerates when he applies the gas teaches Brian how to reach and maintain a desired speed with little to no need to monitor the speedometer beyond perhaps a quick occasional glance for confirmation.

It might be difficult at times to see a difference between this experience-facilitated automation of practice and the concept of "distracted driving". In Chapter 1 we saw that a body of literature exists within human factors research which seeks to investigate distracted driving, or what can often be referred to as "mind wandering". Other scholars have also written of this phenomenon. In his analysis and critique of David Armstrong's (1981) description of long-distance truck drivers the philosopher Jason Ford (n.d., p. 6) observes a distinction between two phenomena which are seen as affecting long-distance drivers. One is the form of hypnosis which can occur while driving, for instance when one is driving for a long period at night on straight sections of highway. The other is the much more common phenomenon of distracted driving in which the focus is placed on things such as daydreams, radio, and conversations rather than on the drive itself.

In principle it may not be wholly incorrect to conceive of driving in such a manner as being in some sense "distracted", but I find the term misleading in that it represents a normal condition at which most drivers on an everyday basis operate. In many cases this may not even be a conscious decision as to where to place attention, but rather a result of deeply embodied habit in action (Merleau-Ponty, 2012). For example, in the next chapter we will see how for many informants who commute to work by car the drive provides an opportunity to envision and plan their day ahead and to mentally transition between their home and work lives. And for informants who regularly drove with family or friends a drive was an ideal opportunity to have what one informant called "quality time" in which they could converse and catch up with one another's lives. No driver said they would expect to drive in complete silence.

It can appear to be a rather fine line between what is inattentiveness and what is simply ignoring that which is irrelevant to the matter at hand, but the distinction is nevertheless a significant one. One informant mentioned an example of what they referred to as the stereotypical "old person driver"; an individual hunched over their wheel with their eyes fixed inflexibly on the immediate stretch of road ahead. Rather than being seen as a paragon of safety with their very focused and non-distracted driving they were instead viewed as menaces on the road unaware of perceptions such as their own speed or the behavior of the cars around them and consequently an inconvenience at best and a danger to themselves or others at worst. The perception is that the more deliberately focused on a single task a driver is, the more likely it may reflect an absence of awareness of other essential parts of driving well. Keeping a broad awareness of the road involves being able to simultaneously monitor the road, the speed, other vehicles, how the car is handling, the position of the body, and so on.

Contrasted with the "old person driver" might be a driver deep in a relaxed conversation while glancing from time to time in various directions around their vehicle and not committing any obvious driving errors, who actually exudes a sense of comfort and safety to their passenger, or at least a feeling that everything is under control. This is in part because the act of driving involves social interaction, be this either with a passenger in the vehicle or in occasional interactions with others sharing the road, and

consequently it involves a necessity of dealing with issues of face. Goffman (1959) speaks of the performative aspect of social interaction by comparing it to a theater in which there is both a "front stage" performance intended to be seen by the audience, and a "back stage" performance behind the scenes where performances are prepared. To look comfortable and at ease behind the wheel is to perform the role of, and even more importantly be perceived by others as, a competent driver. To appear overly fixated on the mechanics of driving, especially on a routine drive, is to make plain the amount of effort a driver needs to put into their drive which can project an image of being inexperienced, incapacitated, or worse, incompetent. Another driver or passenger who witnesses it is in this sense witnessing on the front stage something like an apparent backstage rehearsal of driving from a driver who seems unable to perform the "good" driving that appears to others as though relaxed and effortless.

But whether skilled and relaxed or otherwise, the perceptions and situations a driver is presented with on any given drive are beyond what any driver, or researcher for that matter, can grasp within the lived moment. Hundreds of cars, traffic signs, and advertisements may pass in all directions as the world goes about its business on the visual periphery. To attempt to focus on every single object and action being performed would not only be impossible but exhausting and even dangerous. Learning to drive at a level at which it can be practiced automatically is learning what can be forgotten or ignored. While the inexperienced driver we encountered earlier was frightened at the mass of cars and various sensations of speed experienced in merging onto a highway and could not help feeling extremely attentive to each individual step involved in performing a merge, Brian, in the same sort of situation, could not articulate a single example of what was occurring around him after performing the merge, including the conversation we were engaged in at the moment when it happened. The only thing he recalled after the fact was that he had "just merged". Such a phrasing becomes a way of bundling up and then labelling what are the quite large range of skills and routines employed in the situation.

And could this lack of awareness mean that Brian was too focused on our conversation at the time to pay attention to what he was doing? Given the smooth and flawless way he performed the merge it seems highly

unlikely. He simply knew through experience and skill what he felt needed to be monitored and what could be ignored; an acquired ability in which "the skill becomes fully embodied and embedded within the proper context" as Gallagher and Zahavi (2008, p. 138) put it in their work on utilizing phenomenological theory in cognitive studies. Nigel Thrift (2000) argues that bodily practices - such as performing a merge - are not cognitive in the first place, but a product of the cognitive unconscious which "rises out of the layerings and interleavings of body practices and things which we might frame as 'instincts' or, more accurately, as structured anticipations" (p. 40). Thrift's conception here is that a range of relationships are formed with things in the world surrounding the body which enable actions to take place within this cognitive unconscious. In this respect it is also in accord with the earlier encounter we had with Schatzki's (2001) observation of materials mediating practice.

Driving automatically is not, however, a permanent state of experience for any of my informant drivers, no matter how skilled they viewed themselves to be. Certain situations demand more cognitive attention than others. One extreme example we will encounter later in the following chapter is that of a ride-along with Melissa on what became a dangerous icy road. While on the drive in normal road conditions there was little she could recall about what she had done while driving, in the later scary and relatively unfamiliar winter driving environment she could accurately remember and recall after the fact many specific details about driving actions she had taken and those of other cars she had encountered on the road. While this particular experience was the furthest thing from perceiving a drive as being performed with ease, it did not mean she lacked the ability to do so on a routine drive.

The "autopilot" metaphor we encountered earlier was utilized by several informants and its usage seemed to be a way of referencing the acquired and habit-formed and facilitated practices which permitted them to drive on an everyday level at ease and without undue exhaustion. As will be discussed in the next chapter, the ability to switch-on their "autopilot", or at least the freedom to choose when or when not to do so, can be critical to the perception of whether a drive was safe or dangerous, pleasant or dull. But it is also an ability which does not operate in replacement of the

existing material technologies of automation in the car. In the next section we will look at why acquiring the skills to drive automatically is insufficient without the cooperation of the car as well as the wider environment the driver moves through while on the road.

A Space for Automatic Driving

A car is not just a material object, but also a material object which creates for us a distinct and unique physical space when we get into our seat and shut the doors. And, because action is embedded within and shaped by the place wherein it occurs, it is worthwhile to reflect on how the materiality of the car itself creates a space which can assist, or hinder, the ability to drive automatically.

To enter a car is, in some ways, to isolate ourselves from the world surrounding the car, a process which as we saw in the last chapter has been worked on by automotive companies for over a century. At times the experience of sitting in a contemporary car can feel akin to being enveloped by a cocoon. Metal doors and glass windows separate a driver from the street while insulation and climate control features shelter us from unwanted noises and weather. Seats that are fixed forward and a seatbelt placed across the chest and lap limit the range of motion of the body and what we can see of the surrounding environment. It is perhaps not surprising then that descriptions of the car often emphasize this sense of semi-isolation it provides from the world, such as the media scholar Margaret Morse's (1998) reference to the car as an "iron bubble" (p. 199) which, she argues, causes a driver to be alienated from an almost less-real and distant presence of the outside world due to being isolated within a closed off, albeit perhaps comfortable, private space.

Larsen, Urry, and Axhausen (2016) note that "much research stresses how cars isolate people in private cocoons with no contact to the outside world" (p. 112). We see this same theme also present in Edward Hall's (1982) assertion of the car as being something which "seals its occupants in a metal and glass cocoon, cutting them off from the outside world" (p. 176). I would argue that all this, however, is pushing the idea of the car as a place of isolation much too far. While a pedestrian might indeed perceive

the waves of cars rushing past as being "faceless ghostly machines" (Featherstone, Thrift, Urry, 2005, p. 30), this is not necessarily the perspective for a driver.

Unless there is a wide disparity in speed it is not overly difficult to see the face of fellow drivers passing by, and it was not an entirely uncommon occurrence for informants to make the effort to look to see who a driver annoying them might be as they came up alongside. Nor is it especially difficult on many roads to clearly observe pedestrians passing by as one informant demonstrated when pointing out a "hot" jogger running parallel to the road. And physical gestures of communication are not uncommon, either. This can range from an obscene gesture directed at another driver in a moment of anger, to a friendly wave of greeting to a neighbor when passing by along residential streets. Jack Katz (1999) has argued that this dynamic is driven by the fact that the perception of personal space in a car extends beyond the body and even beyond the vehicle itself. Hence, the physical boundaries of the vehicle do not preclude a sense that when behind the wheel and passing other drivers or pedestrians one is entering their personal space or vice versa (p. 32). No informant felt completely invisible and isolated within their vehicle. If the car is a cocoon, it is always a partially transparent and permeable one. This permeability means that a driver's behavior within the car can take on attributes of both of Goffman's (1959) aforementioned metaphors of the front stage and back stage, in which a driver may at one moment deliberately perform friendly or unfriendly gestures for others and at the next moment "[he] can relax, he can drop his front […] and step out of character" (p. 488) as though they are alone.

A cocoon metaphor does, however, accurately convey the importance of feeling comfortable within a car. This process of feeling as though "at home" in a car - which is to say to experience a sensation both of deep comfort with as well as ownership over the space - begins for many drivers at the very point in which they step into their car. For a skilled driver they have already, through frequent usage of their vehicle, developed a relationship with their car and established a sense that it is their own. For Brian his truck was also his "baby" as he told me. In noting how objects can often become as though they were extensions of the body Frykman

and Gilje (2003) observe: "'My' car is, for example, not interchangeable with other cars of the same type and age. Something of it also resounds in me. Is it the smell of the PVC coated fabric or petrol in the cab, the sound of the doors when they slam shut, the purr of the engine, the feeling of sitting in the seats? We all have the experience of stepping into a complete world where you get in 'your' car" (p. 46). This vividly illustrates that to feel at home in a car involves more than just possessing skill with the motions of operating a vehicle. It is also important to establish a familiarity with the sensations of the sights, smells, and physical touch afforded by the materiality of the car itself. And as we will see, this familiarity is also established and maintained through practice.

Connecting to the Car

For Piotr Sztompka (2008) one of the defining features of everyday life is the tendency for everyday actions to "assume ritual, dramatized, stylized forms following certain un-reflexive, deeply internalized scripts" (p. 10). These scripts can facilitate the linking of micro-practices. For instance, many of the drivers I observed utilized one such script in the steps they took in order to settle into their vehicle and to prepare for the drive. These were perhaps most visible with those informants who had cars which they shared with other members of their household. To start a car was rarely a matter quite so simple as just turning the key and accelerating away.

There was always a process involved to prepare for a drive, even if such a process might pass so quickly as to be hardly noticeable. For Brian, preparing for a trip meant first turning on his truck and then waiting for the heater and seat warmers to kick in in order for his truck's interior to reach a temperature he felt comfortable driving in. While waiting he would adjust his audio system to make sure that the music he wanted to listen to was playing and at the volume that felt right to him. Another informant shared her vehicle with two other members of the household and would not start her car until she had first rocked back and forth a little in her seat to double-check that it had not been moved, and then touched her rear-view mirrors to make sure they were exactly where she wanted them to be.

Other drivers had their own routinized processes of starting a car. Although the steps involved could appear to be taken very deliberately, I found it was possible for a driver to be entirely unaware they had a particular way of starting a car, and to be unable to articulate what they had done after the fact. The informant Emelie offered a fairly representative sort of comment when she stated: "yeah, so I just sit down, turn the key, and go I guess" (Interview with Emelie, August 3, 2015). In fact, Emelie appeared to have a small ritual of first settling into the seat, glancing up to fidget with her mirror, twisting her body slightly to lock the car doors and momentarily double check that they were actively locked, and then to turn the key to start the engine before finally buckling her seatbelt, pulling it slightly to check the tightness, and then turning on her radio before accelerating away.

Once a driver has settled into their car and begun their drive they are inevitably in a constant and continual interaction with a range of equipment within their vehicle. Indeed, often with several pieces at once, such as the usual process of holding onto the wheel while pressing a foot alternately on the brake and then gas pedal to make a standard turn. The necessity of constant physical interaction of this sort with the vehicle is especially true in the absence of something like a self-driving car, however even in a car which possessed an autonomous-drive capacity one would still be unable to avoid the physical sensations of movement and being bodily connected to the automobile. In this sense, both the driver and the vehicle are critical to a drive at present. Without a driver the car is a stationary object, and without a functional car one is not, at least at the given moment, a driver.

One way in which this connection between a car and driver can be understood is presented by the sociologist Tim Dant. Dant (2004) views the relationship as an assembled "driver-car" which is "neither a thing nor a person; it is an assembled social being that takes on properties of both and cannot exist without both" (p. 74). To successfully create and sustain such a being involves the ability to effectively form an embodied orientation to the world through the car. And to do this, in turn, requires a certain level of embodied knowledge and familiarity with the machine itself. As Dant (ibid.) further observes, this assemblage between a driver and their car is neither random nor by chance. It has instead come about through deliberate choices

both in the engineering of the vehicle and by the choices made by a range of actors including the drivers themselves (p. 62). The pairing of the technology of the car with the embodied skills of the driver together act in a way that permits actions which draw upon both and enable automated driving.

Establishing a sufficient store of embodied knowledge for driving involves first knowing where the various pieces of equipment essential to the operation of the car are located and how to manipulate them; such as being able to find and depress the pedals, knowing where the speedometer is located and how to read it, being able to put the car into the necessary gears, and the like. This may be enough to get the car moving, but it is not in itself sufficient to be able to drive without closely monitoring and double-checking the behavior of the car. Even for otherwise skilled drivers the smallest differences in the feel of the response of a piece of equipment can be immediately noticeable. Maja related an occasion in which she had to borrow a car of a different make and model from her own vehicle:

> "So, among the first thing that I notice was, you know, the different sensation of feedback in your hand from shifting the gear. One was very precise, I guess, and very finite the other was perhaps a little bit wobbly. My car is precise but also at this point a little bit, you have to, it can be a little bit moody perhaps sometimes. It's very... you have to know it. I like it to be, precise I guess, and it's very difficult for me to put it in words that particular feeling. It's not rigid but it's, I keep wanting to say precise or concrete you know there's no wobbling in it. It goes and it stops and it's very geometrical." (Interview with Maja, August 3, 2015)

This speaks to several points. Firstly, it says something about the way in which driving is a thing we come to understand tacitly and not in a way that is easily articulated. In saying she finds it difficult to put into words the feeling of her gear shifter she is not saying that she isn't well aware of how to shift gears, or when a gear shifter it is operating exactly as she expects. Rather, she is pointing out that a perfect gear shifter is something which just has to be felt. Until our interview she had not needed to find a way to describe the experience before as it was not something she routinely reflected upon deliberately. Her knowledge of the gear shifter had become fully embodied. It is perhaps

illustrative that she felt it easier to explain what felt wrong in other car's gear shifters to her than what felt right about her own familiar gear shifts.

Secondly, it also reiterates the significance in driving of the physical feedback given by the equipment. For her, one manual transmission is not the same as another, even if the gears themselves or even the technical performance of the shift were identical. In this particular case she did not mention that she felt one car was more sluggish than the other in the process of changing gears. The issue for her was that the unfamiliar sensation of shifting the gear stick within the box itself caused her to experience the drive in a slightly unfamiliar way, and for some time to feel as though she had to mentally double check that she was doing things right when shifting. It is also interesting that she describes her old familiar car as being "moody" during a gear shift. Of course, she did not literally believe that her car possessed a sentience. But it serves as one way to label the fact that she had formed a bond of experience with her vehicle to the extent that it seemed for her as though the car and driver were able to "read" one another to operate in a manner which felt familiar and comfortable.

This phenomenon can also be seen in the tendency among craftsmen to view the materials they work with in anthropomorphic terms (Sennett, 2008, pp. 135-144). More than just a collection of abstract metal, glass, and plastic, the car is given human attributes such as being sexy, forgiving, or, in the case of this informant, moody. Sennett (ibid.) argues that there is more than the language of metaphors at work here. Rather, "the attribution of ethical human qualities – honesty, modesty, virtue – into materials does not aim at explanation; its purpose is to heighten our consciousness of the materials themselves and in this way to think about their value" (p. 137).

In the aforementioned example this is in part a reflection of the importance of the car itself to its owner, but also directly points to the perceived importance of the gears, the gear shifter, and the process of shifting gears. That the item is assigned anthropomorphic qualities is not necessarily because a gear shifter in isolation would be of any value to Maja, but more significant is the shifter's necessary role in her manual transmission driving practices. The shifter forms a key means through which to feel and be connected to the drive. When all is going well for Maja, the movement of the shifter through the gear box presents a comforting sense of familiarity.

Conversely, if the gear shift is made at the incorrect time, the engine sounds will immediately make it alarmingly obvious that something is wrong. But when the shifter shifts and feels exactly as she believes it is supposed to, it enables the car to "car" and a driving flow to be maintained. By this I refer to the Heideggerian concept of *Zuhandenheit,* or "ready-to-hand" in English, in which an object can become unreflected upon and as though invisible so long as it is fitting within a flow understood and established through a network of purpose and practice that is sustained unless something interferes (Heidegger, 1962). A "car-ing" car is a car operating in a flow.

But while gear shifting can be "moody", and acceleration can be "sluggish", it is probably more difficult to envision how one might anthropomorphize something one is not in frequent physical contact with, such as a gas tank cap. The more familiar a car and/or piece of equipment comes to feel, the more value we place upon it, and the more embodied knowledge and routines that develop around it, the easier it is to feel connected and to express this connection through anthropomorphizing language. A familiarity with the direct materiality of the car is only part of the picture, however.

Perception and Movement

It is not only the physical sensations of feedback from the vehicle which need to be converted into an embodied knowledge. Just as important is the way in which a driver comes to familiarize their perception of the surrounding world through their vehicle. One such example which emerged in the fieldwork was that of moving between, for example, a car and a truck or vice-versa. When Brian offered to let me sit behind the wheel of his large truck, I found myself disoriented and uncomfortable with the very pronounced feeling of being lifted above the road and feeling as though I was somehow looking down upon myself. Conversely, when I put Brian behind the wheel of my low sedan and offered to let him drive, he was immediately uncomfortable with what he described as the sensation of crawling along the road. Neither perception necessarily prevents the ability to drive outright. For example, neither of us lacked the ability to see road signs, lane markers, and other cars from these unfamiliar vehicles and, of course, we could both drive our own vehicles without problem.

What did happen for us in this situation, however, was that the sensations of being disoriented from our familiar viewpoints in a vehicle affected our ability to drive without conscious effort as we sought to adapt and refamiliarize our driving practices and sensory experiences. For myself it was, in part, a matter of attempting to reorient my body spatially, both in terms of adapting to being physically lifted above what I was familiar with as well as to develop a new understanding of a bodily extension through the truck. By this I mean the sense that I was suddenly physically larger by being behind the wheel of a much larger vehicle and realized I could no longer comfortably squeeze into the sorts of parking spaces and gaps in traffic that I previously could in my car. I also had to adapt to feeling as though I was disconnected from the road somehow by being physically further above it as well as the decreased feel of the road from what I was used to due to the truck having much better shocks than my own vehicle.

In this situation, the floating metaphor encountered in the previous chapter was made tangible in a way that was unfamiliar and disorienting to me but was both comfortable and desired for Brian. He, in turn, experienced an almost immediately noticeable annoyance in that by being placed lower than he was familiar with he was no longer as confident with making right turns. At most intersections in the United States one can make a right turn on a red light so long as the traffic is clear. But a fairly common situation for a driver of a small car to experience is to have a larger vehicle pull up alongside in the adjacent lane intending to turn left, thereby blocking one's own ability to see whether the road is clear to safely turn right. A driver commonly adapts to this situation by slowly and carefully inching their car forward to try to regain a sight line to the intersecting road, but this is an unnecessary practice when you are able to simply look through or over the other vehicle when sitting high in a truck. In this way, for Brian, the idea of comfort was linked to the sensation of detachment from the road and convenience was connected to the ability to "float" above it while looking down at what was going on around him. Again, none of these differing experiences by any means prevents the ability to drive outright, and in most cases to drive without serious incident. But it does mean that previously embodied practices and experiences are shaken up and the conscious effort required to drive is, for a while, significantly increased.

It was only upon actually driving my sedan for a bit that Brian started to become comfortable with how the world appeared while driving again. This is in accordance with Tim Ingold's (2011) observation that "perception is fundamentally about *movement*" (p. 11). Here Ingold draws upon the work of psychologist James Gibson (1979) in arguing that perception is a phenomenon which involves both the usage of the entire being rather than solely the mind and that it is not about perceiving things in themselves but rather what those things allow for within whatever activity one is engaged in. This is to say that perception draws meaning through a "productive engagement" (Ingold, 2011, p. 11) with the surrounding world and these engagements are how we come to know the world. As such, visual observation alone is often insufficient for forming perception. No matter how long Brian sat still behind my wheel looking out the windshield he would be very unlikely to feel completely at ease with the view of the outside world the car presented to him until he had actually had an opportunity to form a new and increasingly familiar relationship with the world by moving about it in the vehicle.

To return to Sennett's (2008) concept of the craftsman, it was the experimental aspect of getting to experience how the vehicle would feel, react, and sound in different driving situations which enabled him to feel comfortable. Initially, for instance, he tended to brake for red stop lights while at a wider distance behind any cars in front of him than he would in his truck while he attempted to feel and see how tight the unfamiliar car's brakes were. After doing this for a bit he was able to return to his usual braking habits as the sensations were becoming embodied, and he no longer had any need to think so much about braking. This ability to understand and perform without reflection is the essence of a culture of skilled driving. Driving is not about reading gauges, for instance, but in *knowing* speed. Or to be able to understand speed and movement without a speedometer to the extent that one can successfully drive even when the head is turned and the eyes are not looking forward, as on a merge onto a highway while looking for cars alongside. It is, in a sense, an embodied understanding of physics.

To perceive the movement of the world through a material object is also to create a situation in which the object can become an extension of the driver's body itself in the manner that was introduced in the first chapter while discussing embodiment. Merleau-Ponty (2012) speaks of this phenomenon

and illustrates how it occurs through the example of a blind man's walking stick and how its use employs both a motor habit and perceptual habit. Learning to navigate with a walking stick involves not only developing a familiarity with the physical manipulations of the stick, but also the sensations that these manipulations bring on. "Once the stick has become a familiar instrument, the world of feeble things recedes and now begins, not at the outer skin of the hand but at the end of the stick" (p. 176). This familiarity bred through habit enables a freedom from needing to interpret where the stick is, and what it is doing, separate from our own bodily positioning.

This proprioceptive way of experiencing the world can come out in various forms through the language people use to describe driving; in the case of one of my informants in exactly these terms. After declaring it as something that "felt odd to say" Anders added that "the car is a machine that I'm at the wheel of, so it is me, yeah. I guess a car then becomes a part of me in a way" (Interview with Anders, April 14, 2017). Other informants would sometimes come to speak of attempting to park in a tight parking space by attempting to judge whether "*I* can fit" or that "*I* need to squeeze in" rather than to say that they hoped the car would fit. To experience something as a bodily extension is to establish a sort of embodied knowledge of an object in a quite intimate sense.

Putting it Together

So far in this chapter I have mentioned three particular aspects of their vehicle that a skilled driver has developed a deep familiarity with, namely: a) the location and operation of vital equipment, b) the physical sensations given in feedback through the car when these pieces of equipment were utilized and how to effectively understand and react to this feedback, and c) an internalized perception of how the vehicle moved through the world. When a driver combines these familiarities with the learned experiences of acquiring general driving skills and routines as mentioned at the beginning of this chapter, then I would argue that they have created a situation in which they can form a highly effective version of Dant's (2004) driver-car assemblage. In this state both the sensory information which may be tangibly seen, felt, or heard as well as that which is intangible, meld together in a meaningful way.

This is significant in that it is the point at which, in the right conditions, the conscious awareness of driving itself can begin to disappear. Attention can instead be redirected towards other things, making the experience of the drive feel less exhausting and generally more enjoyable. This reflects what was earlier said of Heidegger's (1962) concept of objects which are "ready-to-hand". This is the state in which, to borrow from Heidegger's own example of the hammer, an individual proficiently hammering a nail begins to lose sight of the hammer itself and can simply enjoy watching the nails be driven into the wood. An equivalent for the car is that the operation of the driver-car fades to a state of peripheral attention as the focus is shifted towards thoughts, conversations, music, or some other desirable equivalent. "Fades" is very much an important word here as the shift between focal awareness and peripheral awareness is not typically an immediate one. Part of the surprise that informants related experiencing when realizing they were deeply unaware of what they had been doing while driving was the very lack of awareness that it was happening as their attention drifted off to some other activity.

This condition, which we encountered earlier as the phenomenon generally known in cognitive research as "mind wandering", and something often viewed as to be avoided while driving (He et al., 2011), can exist until some event brings the act of driving back into awareness. This switch back into a focus on the drive could occur for my informants via a breakdown in the driver, e.g. a change from driving as though on autopilot to falling asleep at the wheel and then snapping back to attention. It could come from a breakdown in the car, e.g. seeing the appearance of an unexpected check engine light. And, most frequently, it could occur as a result of a breakdown in the environment, e.g. a sudden change of weather for the worse or encountering a severe stop-and-go traffic jam. Quite often the breakdown could be mundane enough that they were not even entirely sure what put them back to a focus on their driving practice.

But for an effective driver-car assemblage to form it is essential to have this capacity to drive on autopilot. Driving skills alone, no matter how well developed, are insufficient. Hence a perfectly skilled driver can experience some of the challenges of a novice driver when placed in an unfamiliar vehicle or environment. I encountered an extreme version of this many

years ago when a good friend from France visited and rented a car with automatic transmission. I knew from personal experience that she was a perfectly competent driver of manual transmission automobiles on the streets in Paris, which to me had appeared utterly chaotic, and hence I saw no need to worry about her ability to handle a much "simpler" automatic. However, within several minutes of hitting the road, to her great mortification, she struck the back of a stopped car at a red light because, as she explained it, she had been so disoriented by the automatic transmission that, despite knowing better, she had a feeling in the moment that the car would automatically stop. The defamiliarization of the embodied practices introduced by taking away the ability and need to change gears prevented any sense of flow to develop for her. Instead of her forming a driver-car assemblage to drive without conscious effort, and to be comfortable with the car assuming control of the gear shifts, she became hypersensitive to the differences from her own embodied experiences and overcompensated by expecting the car to handle an action which it was not capable of performing.

Depending on the driving skills and familiarity with aspects of a new vehicle a driver is placed behind, they might adapt very quickly and be able to drive on autopilot in short order. Indeed, within several minutes of driving on familiar roads Brian had stopped paying close attention to his drive while behind the wheel of my previously unfamiliar vehicle. For other drivers of less confidence, skill, or experience with the encountered situations the period of time it takes to acquire sufficient familiarity will, of course, increase.

It is, however, not only the driver that possesses competencies at automatic driving. While none of my informants drove cars with full self-driving technology, this does not mean that their vehicles were not already capable of assuming control over a range of different driving tasks. In this next section we will look at the role automated technologies in the car can play in facilitating, or hindering, the capacity to drive on autopilot with a particular focus on the empirical examples of a car's transmission and cruise control. And in doing so we will see how some informants come to embrace and utilize such technologies while others elect to reject them.

The Usage of Existing Technologies of Automation

While they may not yet be capable of fully autonomous drive, existing vehicles are still complicated machines containing a range of already automated functions. Some, such as electric starter motors, are both omnipresent and mandatory in that the driver has no alternative but to use them. Others, such as automatic transmissions, are technologies which must be used by the driver if they are present, but there is generally a degree of choice as to whether the driver wishes to have the system in their car in the first place. And yet others, such as various forms of driver assist technologies, can be utilized purely as a matter of choice at a given point in a drive no matter whether their inclusion in the car is standard or optional. In all three cases the technologies can be, and often are, drawn upon by the driver in order to facilitate the capability of driving automatically.

There can, however, be a discrepancy between what is actually automated, in a technological sense, and what is perceived to be so in a given moment. Often this is simply a matter of it rarely being necessary to reflect on the technical intricacies of the car itself. Bruno Latour (1999) argues that technology can be made "invisible by its own success", and that when nothing is amiss "one need focus only on its inputs and outputs and not on its internal complexity" (p. 304). A contemporary vehicle's self-diagnostic capabilities are a good example of this. When I would ask informants if they could tell me what sort of functions are automated in their vehicles this type of automation would never come up. This was not due to ignorance that it was a form of automation, indeed if I would bring it up myself, they would quickly acknowledge it as an example of automation. Rather, it reflects the fact that it is one of many such technologies that are unreflected upon and invisible in a normal drive unless they happen to suddenly, and sometimes dramatically, make their presence known. An unexpected appearance of a check engine light on the dashboard can be a highly disconcerting event and one that directs attention back onto the drive.

But in many cases the perception of which automated technologies are available to a driver is dependent on there being manual alternatives to the technology, or at least a memory of a time when the driver knew of manual

alternatives. Automatic transmission, for instance, is automatic precisely because one can still have the option to drive a car with manual transmission. The car's electric starter motor, however, is never referred to as an automatic starting system by informants because the ability to turn a key and have the car start is all they have known in their lifetimes. Hand cranking a car to start the engine has now faded long past any sense of familiarity, and sometimes even recognition, for the average driver. In fact, when the phrase "automatic start" is encountered it nearly always refers to the remote start systems which many contemporary cars possess in which some system, such as a button on the keychain, enables a driver to start their car before entering it. And in the future, should keys and keychains themselves become increasingly obsolescent, would the act of having to press a button on a keychain to start a car become the example of manual ignition? What is automated can, conceptually, be a very temporal phenomenon.

But if a driver is employing such automated technologies that are largely invisible to them either in form or function who, or what, is actually driving? This speaks back to the usefulness of conceptualizing the act of driving as involving a driver-car assemblage in that the driver and their automotive technologies truly become, as Dant (2004) says, inseparable in order to facilitate the capacity to drive. The car, at present, cannot operate without the driver and the driver, in turn, draws upon automated technologies to enable them to not only drive, but to drive in a manner that feels comfortable and familiar – even if they may not always be aware of just what those technologies are or when they are being used. But none of my informants utilized all the automated driving assist technologies that were present in their vehicle on a constant or even necessarily regular basis. We will next turn to see how these technologies were adopted or ignored.

Choosing and Rejecting Technological Assistance

The utilization of some technologies on a drive is a matter of deliberate choice. This may be in the sense of purposely choosing a technology when the car is first purchased or in electing to use a piece of equipment that is present in their vehicle while on a drive. Perhaps unsurprisingly, the choice of whether to employ such equipment was often described by my informants

in terms of whether it felt as though it made driving "easier", or "more convenient", in a given driving situation. Put another way, it is when a piece of equipment has a place within their driving practices and enables their drive to enter, or sustain, a period of being able to occur as though automatic.

For this to happen successfully, the technology must first become embodied. This embodiment provides an opportunity for the body to experience a sense of flow within the activity without the need for conscious effort (Merleau-Ponty, 2012). The first step in being able to establish such a flow is to acquire familiarity with the technology through practice. In the case of introducing a new or unfamiliar piece of technology to an already skilled driver it involves, in a sense, a process of re-learning how to drive, albeit generally without the complexity of attempting to acquire familiarity with quite so many new systems at once. First, a conscious effort is made to test the technology in various driving situations. For example, one informant who had recently acquired a new GPS navigation system for his car made a point to first enter destinations that he already, for the most part, knew how to get to without navigational assistance. He thought by doing so it gave him a chance to make sure he could trust that the GPS would not lead him astray before he began regularly using it on new routes that he was entirely unfamiliar with.

So long as a meaningful role has been identified for the technology to fulfil, and there has been no reason to mistrust it, new practices will then start to become established around the technology that both adapt to and alter pre-existing routines. As the micro-practices that comprise these routines become more practiced, the need to reflect upon them decreases and they can begin to become truly embodied. Rear-view cameras that provide parking assist are a good example of this phenomenon. Like other embodied tools they permit the body to extend beyond its actual physical limits (Lindblom, 2015). In this particular technology the camera becomes a new set of eyes. If the old parking practice involved turning the head in order to try to see and sense how much space there is between the car and the objects around it, the new practice is to keep the eyes fixed on the display screen. But the switch between practices is not a sudden and fully formed one. The single informant I spoke with who possessed a rear-view camera spoke of the initial disorientation he felt in trying to figure out which way

he needed to turn the wheel while reversing into a parking space with the camera. While he immediately felt its utility in determining an exact distance between his car and other parked cars that was otherwise hard to see or perceive visually from inside the car, he still felt it necessary to double check visually that he was actually doing what he thought it looked like he was doing in the camera screen. After a few weeks of parking in this manner he came to reorient his perspective when reversing to that which was provided through the camera screen and it was then that he felt much more secure about reversing without utilizing the previous sort of two-step verification.

This familiarity with a new technology can then permit changes to other driving practices which may not have been originally foreseen. Now, instead of looking for a parking space that will not require parallel parking, as several informants stated they did when possible, a driver who has embodied a rear-view camera might feel considerably more confident to take any available parking spaces as encountered. And this, in turn, may encourage them to drive onto a busy street where any free parking spots are likely to involve parallel parking, whereas before they might have elected to park on a quiet but further away street and walk to their destination in order to avoid a potential fear of parallel parking, as one individual I spoke with regularly did when driving into a city.

In this sense automated technologies, when accepted and utilized successfully, involve a process of letting go. It is, in a literal sense, handing over some, or all, control of the function to the technology. But it is also a matter of letting go of old routines and ways of perceiving the world. And, furthermore, it provides a means of letting go of the necessity to place deliberate attention on the action the technology is automating. Decreasing the number of physical motions required to drive and/or lessening the cognitive workload can, ideally, be used to facilitate and support the capacity to drive automatically.

But having access to the technology is no guarantee that it will be accepted by the driver when a choice is available. In some cases, this may be because the perceived benefit of the technology does not appear commensurate to the effort required to adapt practices to it. One driver of a car with automatic transmission was unsure of what the gears labelled "2" and "3" past "D", for Drive, on his transmission control was for. He

assumed that it must be for helping him get up hills, but the number of times in which he encountered a hill steep enough to warrant such help were so few, and the feeling of uncertainty around needing to figure out in the middle of a drive how his car would react to him changing the gear felt so onerous when he was already used to that process being made automatic, that he had never bothered testing it out.

In other cases, a technology is not used because the technology had behaved at some point in an unexpected and disconcerting manner to the driver. Whether this was due to mechanical error or driver error made little real difference to how it felt. Once trust is breached, and an element of uncertainty and unfamiliarity is introduced, a driver can find it very difficult to keep themselves from thinking about what unpleasant thing might happen, and consequently double checking the technology in a way that breaks the flow of the drive. In many ways the experience of encountering a misfunctioning form of automation can be perceived as worse than the effort needed to perform the task that is being automated in the first place. A driver generally feels capable of controlling their own practices and thus has the sense that they can learn from, and correct, errors in their driving. But surrendering a driver's sense of control to something mistrusted seems undesirable at best, especially when the pre-existing practices seemed perfectly capable of driving the car in a manner which felt successful and relatively easy.

This can be especially true for a skilled driver as opposed to a novice one. When we learn to drive, we expect that there will be a process of time and effort required in order to gain a mastery of the equipment involved in driving. In order to eventually drive at all a novice driver has no choice but to experience and learn from mistakes and other sometimes jarring experiences. The extent of just how uncomfortable these experiences can be is reflected in the fact that if the need to drive is not compelling an inexperienced driver might elect to quit driving altogether either before receiving a license, or immediately afterwards, as two individuals I encountered in my Swedish fieldwork had done. For one of these individuals this was because they did not feel the benefits their car afforded outweighed the financial cost of car ownership. But the second individual had found the unfamiliar experiences, and their own driving mistakes, so uncomfortable and seemingly dangerous that they lost any desire to drive

again after receiving their license. They were entirely unwilling to undergo the sometimes-frightening process of acquiring the embodied knowledge of driving, especially when the car was not essential to their life and they could just utilize public transport instead.

However, once the practices and skills of driving have become sufficiently embodied there is often less need or patience to tolerate discomfort. It can be the case that an offending piece of technology can be avoided by choosing to manually perform the function it automates and, in the worst case, there is always an option that the car can be disposed of outright for a different model. Cruise control provides a good empirical example of how this process can work on a drive. It is a technology which enables a driver to hand off control over the throttle to their car in order to maintain a pre-set speed and is a common feature on vehicles in both the United States and Sweden. When drivers from both countries were asked to name what sort of automated technologies were present in their own cars, cruise control was a common first or second answer. But having a technology, and understanding a technology, does not guarantee that the technology will be used. For many informants, cruise control was a feature that was either never, or rarely, used. Indeed, the ability to easily recognize cruise control as an automated technology can sometimes indicate a problematic relationship with the technology. Visibility is not always a positive thing, as we noted earlier in Latour's (1999) observation that successful technologies often become invisible. While no informant self-identified their vehicle's diagnostic systems as an automated technology, it was also the case that none of them had had any especially negative experiences with the technology either.

In the case of informants who did not regularly use cruise control their choice wasn't made for a lack of understanding of the theoretical benefits of the technology. When asked whether he thought cruise control was a useful technology Rob responded:

> "Yeah, I have used it before in driving and it really is a nice feature to be able just to set it and know that you're going to stay at, you know, 72 miles an hour whether you're going up a hill, down a hill, just for really long drives it really relieves the constant, you know the muscle tension that you would need to keep on the gas pedal." (Interview with Rob, December 22, 2016)

And yet Rob also answered "no" when I immediately asked afterwards whether he ever used his own vehicle's cruise control. The sort of drive he was envisioning cruise control as being nice to have on was one in which he said he never took, and if he did, he wouldn't really think of using it anyways.

This was a quite common theme for many informants with cruise control. It wasn't a technology which they actively disliked having available in their car, and in their imagination they could perhaps envision driving situations in which they might be likely to use it, but those situations came about so infrequently that they never established any particularly salient practices around their cruise control. Occasionally on a drive-along I would note that we had entered the sort of long stretch of open highway which I was told was ideal for using cruise control, but at no point did any driver activate it. When I asked why, all had stated that they either hadn't really thought about the possibility or, in one case, that their mind was elsewhere. In fact, it was the informant Malin, who drove the least of any of the informants I worked with and who no longer owned a car, who stated that she would frequently use cruise control when she had the opportunity. She sometimes had to drive company cars between southern Sweden and Stockholm and the technology seemed somewhat novel and offered her a chance to rest her feet in a way she appreciated on the long drive.

But it wasn't always the case that cruise control technology was perceived as only infrequently useful or with indifference. For two informants there was outright rejection for what were two outwardly different reasons. In the case of Ebba, she felt that cruise control disconnected her from the sensations she relied upon while in the car:

> "Because for me driving is as much about the feel, it's as much about feel as it is anything else. When cruise control is on and my foot isn't on the pedal, I'm not feeling that feedback from the road to the pedal to, you know, it's just, it's missing a piece of information for me. So, I don't, I don't like cruise control." (Interview with Ebba, February 18, 2015)

After saying this she reflected that the only time she would consider using it was on an open road if her foot or ankle felt like it really needed a break, but then she had second thoughts about this idea concluding that in the

end she would probably rather have an aching foot on the gas pedal than to have the car drive along without her familiarized sense of feedback. The absence of feedback seemed to, in some sense, de-embody the experience of the drive for her. Instead of gaining a convenience she felt she was losing a component of driving that was important to her. This feedback that she lost wasn't so critical that it made it outright impossible to drive, but it was just enough of a loss to prevent a flow in the drive by way of being stuck with a nagging absence of an expected feel to the drive. And this doesn't mean that automation in itself was the problem. Ebba had often experienced the sensation of driving on autopilot and had no real discomfort with the experience of doing so. But being in autopilot did not provide her with a sense of being disconnected from her car, on the contrary it reflected feeling quite comfortable in it.

As in the example of the Teletouch system on the Ford Edsel from the previous chapter, her experience is indicative of the tension which can exist between encounters with new technologies and established ideas of how a drive is supposed to feel. As we have seen there is a lot more valued by drivers than just pure convenience, or what they are told is supposed to be more convenient for them. In the case above, as in many such cases, the problem seems to be in differing conceptions of what convenience actually is. For some engineers and designers, it may seem to be an objective fact to say that cruise control is more convenient for a driver because they gain a freedom from needing to constantly keep their foot on the gas pedal while on long stretches of road. For Ebba, convenience was more about being able to maintain a flow to her drive without having it broken by needing to reflect upon the new sensations, or lack of the old ones, of having the cruise control activated. Something is convenient only so long as it fits in with a driver's practices and is experienced as such.

In the case of Maja, the aversion to cruise control was a result of a single incident which occurred while on a road trip in Norway:

> "I don't know if it was poor cruise control, or poor usage, but there was a bit of a scary moment when I think we were driving in Norway of all places with all their roads that wind and turn and there are hills like up and down. And we were using cruise control and it was very possibly human

> error, we probably weren't supposed to use cruise control on such a road because you have to be very mindful of the speed that you're driving, and since we were using cruise control there was a moment when the car suddenly just accelerated very heavily or something like that, or lurched, I don't remember. But it was really unpleasant, the loss of control. No one stepped on the accelerator, the car just suddenly on its own..." (Interview with Maja, August 3, 2015)

Ostensibly the two experiences are different stories, but they connect to the same basic problem. Namely, both situations disrupted and defamiliarized the familiar routines, expectations, and experiences that grounded an ability to feel relaxed in the car. And just one such experience can be one too many to feel comfortable with utilizing the technology again. While an informant might be able to write off their own driving mistakes as part of a learning curve, or just generally being human and prone to error, a technology is expected to work as desired every time. If it doesn't, then there might be no need or wish to give it a second chance. For a period of time someone might tolerate, and even form new routines around, something such as a problem with slowly-leaking engine coolant – disruptive as it may be – so long as the alternative is to have to spend lots of money and deal with a temporary loss of their vehicle. Avoiding an automated driving-assist technology often carries little to no penalty at all.

So Why Automate?

The objective of this chapter has been to investigate whether, and in what way, driving at present might be seen as already automated. It has argued that, in a perceived and meaningful way, the activity of driving is already in some sense automated through practice. While these practices may draw upon automated technologies, they are not dependent solely upon them. It has been argued that this ability arises through the well-practiced skills and habits formed over time by skilled practitioners of driving. However, these habits and skills do not merely coalesce around an abstract body of knowledge about driving. Rather, I have argued that it is the embodied aspect of driving that is key to understanding both how driving

can become automated in this manner as well as more broadly what driving is and what it means to people. This embodiment can come to take the form of an effective driver-car assemblage in which neither the car nor the driver can be understood in operation without a consideration of the other.

In this sense it would be inaccurate to view driving as being solely about a reactionary cognitive process of learning over time how to more closely monitor the road and operate the mechanical equipment of the car. Such a reductionist approach would miss the way in which driving is experienced and felt through the body as a whole. The more familiarized the sensations of driving are, the easier it is to feel at ease and to learn what can be ignored or only loosely monitored. This is why, when drawing upon Goffman's (2005) research on social interactions, the argument was made that a competent driver is often more likely to be perceived as the one who expresses ease and relaxation rather than the one whose undivided attention is placed narrowly on the drive itself.

We also learned through Goffman that driving situations possess an expressive order which enables drivers to understand and make sense of the actions of the vehicles around them through a shared understanding of the various cultural processes established around driving practices, such as the aforementioned cultural practice of merging. Violating this order results in a loss of face and consequently a failed social interaction which might lead to things such as anger and vulgar gestures.

There is no assertion, however, that the material technologies of the car itself are minimized in the role they play in experiencing and facilitating an automated driving experience. Indeed, these technologies are routinely depended upon in order to permit the ability to drive on autopilot. An individual only familiar with an automatic transmission system will not be able to drive without significant effort the first time they try to drive a vehicle with a manual transmission. But just as these technologies can shape driving practices, they are in turn shaped through driving. An optional piece of automated technology which has never had practices develop around it, which interrupts the sense of connection a skilled driver has to their vehicle, and/or which breaks up the flow of a drive is unlikely to be adopted by the driver if they can avoid it and might be rejected outright.

The significance here is that these experiences with existing automation will frame a point of reference and orient a driver towards the way in which future forms of automation are understood, perceived, and experienced by them. No driver is encountering automation as a blank slate. And like existing technologies, future automated technologies in the car will need to go through this same process of being embodied and familiarized and will, if possible, be underutilized or excluded in driving by drivers who are unable to establish practices around, and familiarity with, the technology.

An objective of this chapter has also been to work towards furthering the scientific discussion on driving that takes a serious look at the actual practice of driving, and especially everyday driving. While not losing sight of the material significance of the car itself to its owner, I have sought to demonstrate that not only are the micro-practices of everyday driving worthy of close attention, they are also the means by which a sense of automatic driving becomes possible. At the same time, this chapter has also demonstrated the importance of the concept of embodiment to understanding why individuals drive, and experience driving, in the manner in which they do. One should recognize, and treat seriously, the way that new driving experiences will be filtered through developed expectations and past experiences of how a drive is supposed to feel. Now, in the next chapter, we will turn our attention towards looking at what possibilities are opened up within the car for a driver once their driving has become effectively embodied and automated.

Chapter 4
Daydreams and Time Machines

In the previous chapter I investigated the way in which driving can become automated through embodied practice for a driver by drawing upon both their own skills as well as the mechanical technologies of their vehicles. But what then does driving become once it is automated in this manner? If attention is not being placed on the physical motions of driving where is it being placed? And how does this impact the feel of a drive? While a focus of the previous chapter was on practice and embodiment, this chapter will largely be about space and embodiment.

The chapter will seek to answer the third research question posed at the beginning of this thesis, namely, what does driving become once it is automated? To answer this question, it will begin by looking at what informants are doing while their drive is on autopilot and how the car becomes a space of imagination and, sometimes, sociability. Drawing on the work of Ehn and Löfgren (2010), as well as Goffman (1986), it will argue both that these periods of daydreams and conversations are far from meaningless and that the unique space of the car provides a frame which shapes how these moments play out. In this respect the chapter will contribute towards a discussion within cultural analysis of how seemingly mundane and solitary activities of everyday life are capable of structuring experience (see Ehn & Löfgren, 2010) and, in this case, frame the meanings attached to driving.

It will then proceed to explore the way in which driving automatically can be utilized to move not only through a physical space, but through time as well. Here it will draw on Elizabeth Shove's (2003) argument that in the contemporary world a conception of convenience is about more than just saving time. It is even more so a means to gain a perception of

the ability to schedule and control time. We will see how the car and its operation serves as a good empirical example of this point, for instance in the manner in which strategizing and advanced planning can be valuably utilized when a driver is permitted to think ahead to the future rather than be stuck in the immediate moment of driving.

Lastly, it will look at how the ability to drive automatically, or not, can impact the way in which a drive is experienced and felt as a positive or negative experience. In doing so it will argue that for many routine drives an uneventful drive is often a "good drive" in that it allows the driver to focus on those valued things which are often only possible when the minutiae of driving can fade to a state of peripheral awareness. In many forms of everyday drivings it is those drives which stand out that are often the ones experienced as unpleasant in some manner.

Daydreams, Decompression, and Driving with Others

If we accept, as the previous chapter has argued, that routine driving is often performed in an automated manner, then an important question becomes what is a driver doing instead? After all, as mentioned earlier, no one can literally drive with their mind turned off. What automation does facilitate, however, is the ability to place attention elsewhere. But where?

For the majority of my informants – especially those for whom the car was primarily utilized for commuting and daily errands – driving was often, if not mostly, a solitary endeavor. This isn't to say that they were unfamiliar with driving with passengers, only that most of their driving time was spent in the car while alone. But being alone did not mean that they felt they were paying more attention to their drive than if they had a passenger to "distract" them, only that their brain would wander to things other than a passenger.

Investigating these moments when, from an observer's perspective, nothing appears to be happening can, however, pose a challenge in that things which are understood as being outwardly invisible and within the realm of imagination may consequently appear as somehow less-than-real. Within recent Swedish ethnology this problem has been faced, in different manifestations, by Anita Beckman (2009) and Peder Stenberg (2011).

In the case of Beckman's (2009) *Väntan* ("*Waiting*") the study takes the form of showing how time spent in waiting, a time which might ordinarily be thought of as a time of nothingness - or rather where nothing happens, or nothing seems accomplished - is in fact anything but. She argues that waiting is, to the contrary, a productive force. It is a time which can be filled with very real frustrations, but also is a therapeutic time in which one feels freed of societal expectations depending on the context in which it occurs. Interestingly, it is also a time in which her informants felt they might be able to experience a more genuine self than that which they project to others in their "real" interactions.

For Peder Stenberg's (2011) *Den allvarsamma leken* ("*The serious game*") this perceived less-than-real world being studied is that of online gaming in which he challenges the notion that one can make a firm point of division between an "authentic" offline world and a somehow false, or even meaningless, online world. Rather than accepting this fixed and static border, Stenberg argues that it would be more accurate to construe it as a blurry and permeable border. The time his informants spend within the game world is not devoid of meaning, nor a place of complete escape, nor without real consequences that can spill into their offline world. It is a world in which they routinely engage in what might easily be perceived by others as being more a form of mundane work than light-hearted escape. It is a world in which they may even form romantic attachments that are very much real. It is even a world in which they may come to find their full-time employment. Fundamentally, it is a world which they are deeply invested in, both in terms of resources and emotions.

Both studies face a challenging contradiction in that for many individuals, including many of the people engaged in the activities being studied, it can be difficult to articulate, or sometimes even admit, that anything meaningful is occurring within those moments in which outwardly either nothing seems to be happening, or what is happening is occurring within a realm which might be framed as being imaginary, or at least in some sense as less-than-real. And yet for many people waiting and online gaming can consume very significant amounts of time in their day-to-day life.

Driving also has an analogous perception problem in that so much of what constitutes the experience of driving is neither outwardly visible nor necessarily perceived as being connected to the drive. This may partly be a result of

language in that "driving", as a verb, implies a certain form of physical action. If you ask someone to explain what driving is, you will likely receive a response relating to physical action. Perhaps something straightforward along the lines of "a thing we do in a car to get somewhere by turning a wheel and pushing pedals". In a literal sense, this is of course not entirely incorrect. But it does not explain the fact that a considerable amount of time a solitary individual is behind the wheel they are either performing no motion at all – such as when waiting for a red light to turn – or they are not paying conscious attention to the drive itself as it passes by on autopilot.

Ehn and Löfgren (2010) argue that a large portion of an individual's day is spent within contemplation and daydreams and that these moments are far from meaningless or insignificant. Rather, it is a productive force which "operates as a wild card, slipping into cracks and forgotten corners, disappearing in all directions, and then returning to bring the present into a new light" (p. 206). Sometimes this can take the form of a sort of mental fantasy of imagining a different world. Every informant who drove, or had driven, on a regular basis was able to relate to such daydreaming experiences as might include looking out a window on their drive and wondering where the other cars on the road might be heading, imagining themselves as being somewhere other than in their car, gazing upon hills in the distance while thinking about how nice a hike through nature might be, or a multitude of other possibilities. Indeed, the materiality of car in particular, and the sensations it provides, can be an especially conductive setting for daydreams in that "the car as a daydreaming tool is shaped by the sensualities of driving – the soothing vibrations from the car, the stillness inside and the wind outside, all the bumps of the road that are transplanted into the body as the landscape whirls past the panorama screen" (ibid., p. 146).

Daydreaming on a drive can serve multiple purposes. Sometimes it can be used as a preparation for anticipated events in the day ahead at the destination. For one informant, daydreaming was an opportunity to think about different scenarios she might encounter at her job and contemplate how she might handle them, sometimes carrying on mock conversations in her head of what she would say, or perhaps what she wished she could say, in a situation. But the more abstract and less daily-life grounded daydreams serve purposes as well. As Ehn and Löfgren (2010) demonstrate, daydreaming

can provide a means to both control and navigate time. This is often reflected in the way in which informants frame their daydreaming. Perhaps the most common answer I was given for why a driver would daydream would be some variant of it serving to "kill time", especially on a long and/or tedious drive. Such daydreams could be deliberate, or they could seemingly spontaneously "just happen" without immediate awareness. In both situations "killing time" meant, in part, deploying a means to compress time to enable it to "fly" by in a way which enabled a several hours long trip to come to feel as though it had happened considerably faster as time passed unnoticed. But for many informants the most frequent and routine trip they took in their cars was their twice daily commute to and from work in which driving on autopilot was a familiar experience.

Commuting

Daydreaming can also provide a means to prepare for a change of context. For Emelie, beginning a commute was an opportunity to make a shift between a "home mode" and a "work mode":

> "I have some time to adjust to the thought that I'm leaving Lund, I'm not in Lund anymore. I'm a step closer to Helsingborg and that means work. It's a time to readjust, prepare, and reflect a little I think." (Interview with Emelie, May 23, 2015)

This quote is in line with Christena Nippert-Eng's (1996) argument that while commuting is often thought of as a chore it, in fact, provides a chance to bridge the transition between home and work. It does this by encouraging us "to mentally detach from and reattach to the realms and selves on either side" (p. 119). This is made possible by the opportunity the commute provides to reflect and daydream in a way that enables future events to be envisioned, and reactions to them rehearsed, while those events which have already occurred can be processed. And in the case of an automotive commute the car can provide a sense of privacy which can facilitate this daydreaming. While a driver may not be completely shielded from the gaze of the world outside the windows, there is still more

insulation from this external world than is afforded by sitting among others on a train or a bus. Crucially, a commute is a period of time in which the commuter is neither at work nor at home and, as something apart from both of those spheres, it possesses a liminal character and a transformative capacity.

While informants were hesitant to discuss, or for that matter even admit to, engaging in any ordinarily private behaviors while driving, almost all could easily recall times in which they saw other drivers on the road engaging in what they felt to be such behaviors. This could be anything from witnessing another driver putting on makeup while driving or one who was evidently singing and dancing excitedly to, presumably, a song on the other driver's sound system. That many people feel sufficiently comfortable to do such things while driving that they might not do in a more clearly public setting, while at the same time lacking enough privacy to not to be observed by other drivers, illustrates the somewhat porous nature of the privacy afforded by a car.

Also, a perceived sense of privacy in a car is often conditional. This was illustrated in the previous chapter in the discussion about the culture of merging. For the individual I spoke with who recalled failing to merge in a manner regarded as competent by the other driver involved, she had experienced a deeply uncomfortable sensation of a loss of face despite not being literally face-to-face with the angry driver behind her. Having this other driver honk and drive aggressively behind her reminded her quite vividly that she was not alone on the road. However, Brian, in performing the same type of merge with ease, made no mention of feeling observed by anyone nor gave any outward indication of feeling so. Blending in through competent and well-practiced driving often means being afforded the chance to experience a sense of privacy, even if you are surrounded by glass while behind the wheel. And this, in turn, can affect what we feel comfortable doing while driving.

But in addition to facilitating a sense of privacy, the ability to use a drive as an effective bridge between the realms of home and work can also be dependent upon the ability to drive automatically. This is to say that driving within a sense of flow permits attention to be redirected towards this processing and rehearsal of the workday ahead or behind of the

commuting driver. Nippert-Eng (ibid.) also argues that "relative to home and work, the journey between them is a spatially, temporally, and socially 'interstructural' location" and as such it provides "the perfect opportunity for mental transitions between realms" (p. 119). In, what she conceives as being a liminal space, there exists an opportunity to smooth the way from and to one's work life and home life. And the way this smoothing is possible is the opportunity to daydream and reflect uninterrupted by the usual intrusions associated with both homes and workplaces. Neither children, partners, nor colleagues can interrupt a driver's thoughts. As one person put it to me "it is some of the only guaranteed 'me time' of the day".

Besides daydreams and reflections, these mental transitions on a commute can also be facilitated by the senses. When Maja was asked why she generally enjoyed her driving commutes to and from work she responded:

> "Well it's not really about the driving itself, I guess. As long as I know the route, I don't have to put any effort into [the drive]. This time of year, I can put on my sunglasses and listen to really nice music. If it's warm enough I can maybe roll down the windows and enjoy the weather. Then you have a really warm, really beautiful day and awesome music in the car and it's the best time to drive [...] actually, you know, rain isn't so bad either. A slow drive in the rain can sometimes be really cozy." (Interview with Maja, August 3, 2015)

Pleasurable sounds of music or falling rain, and enjoyable sensations of the warmth from the sun and a cool breeze through an open window all created for her an environment that could turn what might ostensibly seem to be a boring activity in itself – a commute to work – into a welcome opportunity for private time to enjoy things which might otherwise be impossible during the working day. Indeed, the previous pleasant experiences she had had with the sensations of driving on a warm day or in a gentle rain had already oriented her towards feeling happy when she would again encounter these situations behind the wheel and made the act of driving in itself enjoyable. Drawing again on Ahmed's (2004) argument that emotions possess a capacity to generate action and meaning, we can see that the sensations and emotions associated with commuting in these

particular environments have been embodied by her and open up particular sets of practices. A warm sunny day means rolling down the windows to experience the fresh air – something beyond just cooling off since her car has air conditioning. And the happy mood this places her in then calls for her favorite music to go with it. All of these practices can feel necessary, or at least highly desirable, for her to drive in these conditions and yet none of them on the face of it has anything to do with driving.

Eviatar Zerubavel (1979) has observed that professional commitments in contemporary society tend to stress the value of a person being always available, a demand which only increases as one expands one's professional and social roles. The need to possess regular and segmented periods of time of withdrawal and privacy from these professional and social commitments leads to private time becoming a cherished, and frequently challenged, commodity. While many of my informants did believe that they could, if necessary, take a short phone call while driving, or perhaps quickly glance at a text message, no one admitted to routinely doing so, and all agreed that it was a dangerous activity which should be discouraged. As such, a commuting drive was just this sort of a segmented period of time in which a lack of availability to take phone calls or e-mails was acceptable and not generally perceived by the informants, or their employers, or family, as being negligent of their professional or familial commitments. For some, it can be one of the only periods of a day that they feel is truly their own to be alone.

In these situations, the car commute can present if not an escape then at least a relaxing break from what Lefebvre (1991) refers to as abstract space; which is the space of commodities, bureaucracy, laws, and the logic of capitalism that Lefebvre contends dominate the present world. Abstract space disciplines and regulates behavior in a way which perpetuates and reproduces the space. The privacy a car permits in a commute differentiates the car in some sense from public transport in that these transit systems are firmly within the realm of abstract space, with their enforced rules and expected behaviors. Of course the car can be subject to these same forces, as we have seen, but the solitude and sense of privacy the car can afford means that when a drive is automated new practices can be opened that would not be so easily possible elsewhere; anything from blasting music with the windows down on a warm day to putting on makeup without

being embarrassed. As we will discuss later this perhaps does not turn the car into an absolute space, which for Lefebvre is a space of life beyond capitalism. But a drive can at least appear to open small cracks in abstract space that can take on elements of an absolute space, which is both representational and lived. This is perhaps all the more remarkable in that it occurs within such a heavily engineered and marketed consumer product.

But it is also readily apparent that driving is not always a solo undertaking. Most everyone has had the experience of driving, or being a passenger, with others in a car. So how is automatic driving employed when a drive is not solitary?

Driving with Company

While everyday driving for many informants was often performed alone it is rarely, if ever, always the case. Everyone I had interviewed had the experience of driving a passenger, whether this happened to be a family member, a friend or acquaintance needing a ride, or some other similar arrangement. While having a passenger present does not eliminate the possibility for daydreaming – often there are at least some quiet moments where nothing is being said for some time – it does turn the car into a space for socialization.

Space exists not only as a geographically bounded location but also as a place that is socially constructed through and with geography. Like other forms of spaces, the car is produced through a dialectic of social relations and space (Lefebvre, 1991). In the case of the car there is a conceived and then produced physical and materialized space which mediates spatial practices. Many aspects of this space are generally consistent and immediately recognizable in any given vehicle, regardless of the model of car an individual entering it drives. For instance, there would generally be an expectation that there would be a driver and passenger seat up front and fixed to face forwards, with one, or several, rows of passenger seats behind.

This seating arrangement makes the car a rather unique place for conversation in that a driver and his or her passengers can never directly face one another. While it is true that there may be some analogous physical spaces – a couch for instance – these spaces still do not preclude being able

to turn the head and maintain extended eye contact. In fact, this is rather expected behavior. A driver and passenger are, however, restrained by their seat belts in a way which hinders free and easy movement. And, in the case of the driver, the possibilities for eye contact, particularly extended eye contact, are limited. While automatic driving permits enough attention to be directed away from the drive to maintain a conversation, it does not mean that most drivers feel comfortable taking their eyes completely off the road for too long a period of time. Of course, what feels like too long of a period can vary from driver to driver and situation to situation and may not always be in accordance with what feels comfortable for the passenger.

When eye contact is made with a passenger in the front seat it is generally limited either to quick glances while driving, or to slightly longer glances in those moments in which the car is stopped and waiting for a traffic light to change. In the case of passengers in the back seat, opportunities for eye contact are even more limited due to the awkwardness of physically turning the neck around to face backwards. For the most part this precludes any direct eye contact during the drive, and limits how much eye contact a driver feels comfortable giving at a red light due, in part, to a fear of missing the light change and potentially upsetting other drivers waiting behind them or losing the opportunity to cross the intersection. When eye contact is made with a back-seat passenger it is often by way of using the rear-view mirror so that the driver and passenger can still see one another's eyes in the reflection, even if they are not facing each other.

While ordinarily attempting to hold a conversation with an individual who will only make occasional eye contact with you might be construed as awkward or unpleasant, it carries no such major stigma in the car. Sometimes, instead of being viewed as a detriment to communication, the car could be seen as a much more comfortable and natural place to hold a conversation, particularly with an individual who might only be an acquaintance rather than a close personal friend. This is because, to borrow again from Goffman (1986), the materiality of the car's interior establishes a unique frame which is both understood by the driver and passengers and creates a different set of expectations for social interaction than in other situations. In other words, everyone present already holds a shared, pre-existing, and generally unspoken understanding of what behavior is to be expected and/or acceptable within

the social interactions taking place within the car. And this shared understanding is built around the unique social space and order which the car has constructed for interpersonal interactions. This provides an opportunity for flows beyond transportation to be established and maintained in the car while driving. Yes, the car is utilized as a space for mobility, but the car can also shift to other flows and be utilized as a space for social production in those situations in which the drive itself is perceived as automated. In fact, this shift in flows is only possible when the drive itself is already being experienced as automatic since otherwise attention would need to be placed almost completely on the operation of the vehicle.

Some informants, such as Andrew, were explicit that the space of their car was more conductive to conversation with someone they did not know well than might ordinarily be the case:

> "I mean you're just sitting there, and nothing is happening so you might as well talk. It would feel way weirder to say nothing than to just talk about whatever. Small talk or something." (Interview with Andrew, February 1, 2016)

Of course, as has been argued, it is incorrect in a literal sense to say that "nothing is happening" as Andrew would still be performing all the steps that are required to successfully drive his car to wherever he and his passenger are heading. It is not so much that nothing is happening, as nothing out of the ordinary or expected is happening – which is to say that the driving process is at that given moment being performed automatically and their attention is freed to hold a conversation and, furthermore, they are aware that their passenger might expect a conversation to be possible.

Yet, at the same time, because being in a state of being able to drive automatically and that of needing to concentrate momentarily on a driving situation can be a fluid and plausibly frequently shifting situation, there is always an easy excuse for a driver as to why there might be a break in the conversation which in other social situations might prove awkward. During one particular ride along in Sweden a period of silence between myself and the driver, Fredrik, was broken by a joke he made that if he had run out of things to talk about he could always just pretend he needed to

"concentrate on the drive". When I asked about this comment later, he mentioned that while normally it is a little stressful to have a break in conversation with someone you don't know well – the unwanted "awkward pause" – it is not such a big deal if it happens in his car. If you feel like talking, you can talk, and if you don't you can focus on the drive or turn on some music without needing to worry too much that you are "boring" or "weird", or that your passenger will worry you might think that they are one of those things. Once again, this is facilitated by the fact that the car itself is serving as a frame for social interactions in which it is understood by those present that such pauses are connected to the expected experience of driving and are not intended to be personal slights.

This understanding arises, in part, through the experience of monitoring how others react to the ways in which people behave in a car. But we can see how it also involves another process of face management in which specific actions are taken to avoid experiencing, or inflicting, a loss of face between passenger and driver (Goffman, 2005). The joke Fredrik made about pretending he needed to concentrate on his drive during an extended pause in the conversation is one such example of this face management in action. By performing the mutually understood role of a focused driver he enabled me to avoid any feeling that maybe I was to blame for the break in conversation and hence I could preserve my sense of face. A deep familiarity with the social framing of a drive can also at times make social interactions feel more comfortable than if they were occurring in a more uncertain or unfamiliar environment. While Fredrik didn't car pool, he did have a job that would occasionally involve driving on work-related errands with colleagues and he stated that these tended to be good opportunities to better get to know people he had been working with for some time but had not had much of a chance to get to know while in the workplace. A driver might suddenly actually need to pay close attention to their drive for a moment, or they might only be pretending, but either way there is no loss of face involved so long as the situation feels believable.

But this particular framing is only possible so long as some ostensible need to control the vehicle is present. In a fully autonomous car, such a structure would break down, necessitating a new framing for social interaction in a car and one which might not permit the same ease at

tolerating pauses in the conversation. This does not necessarily mean that the new framing would be entirely unfamiliar or even entirely unwelcome. After all, buses and trains already provide the elements of such a framing. But what this does mean is that the space within a car is no longer a "car space" as such a space has been to date constructed and understood but instead something else entirely. Such a change is not inherently positive or negative but, as we have seen in Chapter 2, new practices and understandings may develop at the same time as some existing ones break down. But not all experiences with passengers involve mere acquaintances. We will next see how informants used automatic driving to facilitate the maintenance of their family relationships.

Driving with Family

Often, driving with a passenger for my informants meant driving with someone they already knew well. One of the more common examples for both American and Swedish informants who had a family with children was the need to drive their child places. In these situations, the ability to utilize the car as a space for socialization could be particularly significant as John, who had a pre-teen daughter, related:

> "Well, my daughter's at school all day, and then after school I've got to get her over to swim practice a few afternoons a week, and if she's not there she's usually hanging out with her friends or whatever. In the evening it's homework or TV or computer time so we don't really have that much chance to just talk during the week. I guess dinner time, but she eats so fast anyways. But yeah, the drive from school to swim practice, or swim practice to home is a really nice chance to just catch up and see what she's up to and how everything's going. Otherwise we wouldn't get much chance to just talk." (Interview with John, January 3, 2015)

In this case both the car and the dinner table come to take on an analogous role as places which provide a structured time of sitting down together and being able to converse and keep up the bonds of family. That both are seen as good places to have deeply meaningful, or at least valued, conversations

is a reflection of being able to perform the practices associated with each of them automatically. Neither the motions associated with serving and eating food, nor those of driving along familiar and well-travelled roads requires so much conscious effort that conversation would be impractical or unfocused. And, whether enforced by family dinner table rules or the impossibility of safely hopping out of a fast-moving car, there are more limited options for escape than might otherwise be usual.

Once again it reflects on the unique sociality afforded by the representational space of the car. It can serve as an extension, or even a surrogate, for other established places of social and family production. One could, for example, get take-out at a drive-thru and consume the food and converse while driving as though the car were a dining table. Just as driving micro-practices become embodied into a way of driving automatically, these usages of the car as spaces other than transportation also become embodied. This deep embodiment makes it a space resilient to major change and one that is unique from other forms of transportation. The privacy afforded means that behaviors which would be impossible or embarrassing on a train or bus are acceptable in the car. One could, for instance, openly discuss sensitive topics or have a fight – behaviors which could face harsh social sanction in a public space. And furthermore, perception of these usages of the space of the car can often take the form of an implicit knowledge. People might not always be able to articulate that the space the car produces is connected to specific flows in their life in a way that public transportation is not, but this does not mean that they are not powerfully oriented towards their cars in Ahmed's (2004) sense of holding deeply-felt impressions that are shaped by culture and memory.

And sometimes the bonding time that can be spent in a car is not just incidental to a drive, but is, instead, the point of the drive in itself. In Chapter 2 we encountered the birth of the Sunday Drive in early twentieth century America. This was an event in which the entire family would get in the car in order to leisurely drive and converse without, necessarily, any particular destination in mind (Young & Young, 2002). While the idea of a Sunday Drive now seemed perhaps a bit antiquated to my American informants, variants of it could crop up. One such example was that of a mother I spoke

with who had two children. When her children were younger, she would struggle to get them to sleep at night but discovered that if she put them in their car seats and drove them around with her husband, they would eventually fall fast asleep. But soon she found herself actively enjoying the opportunity it provided to spend time chatting with her otherwise busy husband. At this point the drives started to become longer and were routinized into a nightly event in which, even after the children had fallen asleep, she and her husband would relax and catch up while driving down relatively empty roads further and further away from home and later and later into the night. Driving in such a case was not something that served as a tool to get to a destination more efficiently. Rather, it was the driving itself which was the very reason why this form of drive was enjoyable and valuable. Far from being an exhausting endeavor, it was a relaxing chance to talk, see, and share new things, and make sure the kids went to bed at night.

This is another example of how the automation of driving allows for a range of flows beyond transportation. In this case getting somewhere is not even a part of the equation. The car has instead been reorganized so that "to car", in the Heideggerian sense, is to produce family. It is not about the destination, but rather about the opportunity to be in the car together. Yet, at the same time, movement is absolutely fundamental to the experience. For instance, they could have simply all gotten into their car and then sat there all night. But then this would not be "car-ring", this would simply be parking. This is also a good example, on a micro-level, of David Bissell's (2016) observation from Chapter 1 that mobility systems actively change those who partake in them. The way in which her family came to relate to one another, and the expectations they shared, were being in some measure shaped by the car as it took them on their late-night family drives.

So far we have seen in this section the way in which both the car and driving provides a framing, in Goffman's (1986) sense, which allows for a specific set of expectations and possibilities for social production that are made possible when the car is being operated automatically through embodied practice. Sometimes these forms can be almost unique to the car, such as a relatively safe space for a conversation with an acquaintance in which lack of eye contact is acceptable as is a greater tolerance for silent moments that often do not feel as awkward as might be the case if the two

individuals were alone in a different sort of space. At other times, these forms can serve as extensions of already familiar places, such as the car as a dining room, or the car as a family room.

But the car is also capable of providing a welcome solitary space when a driver is alone. This can sometimes be a space to daydream, or one in which to mentally replay moments of the day. It can also be a space of transition which serves as a bridge between home and work for a commuter in which they are able to shift themselves, for instance, between the role of an employee and the role of a parent. In all cases, however, the flow of the embodied drive is integral to the production of these non-transportation spaces the car allows and facilities. If a friction has disrupted the flow of the drive then to car is not to socialize, daydream, or eat, but instead to be forced to redirect attention back onto the micro-practices of the drive itself.

Earlier in this chapter I spoke of Lefebvre's (1991) concept of abstract space, which is to say the commodified space that most forms of transit are bound in. When driving is automated, the car seems to become something altogether different from these other forms of transportation. It possesses the capacity of being an intimate space and, as we have seen, a space for the production of family that has existed since the early years of driving. Sets of practices can also take place as a valued part of the drive which have nothing to do with the actual operation of a vehicle. This comes about through an evolutionary process for a driver. As a new driver the car represents an often-frightening space in which we are tightly bound with the conceived space of the engineers as we learn to operate and become familiar with what they have designed. But as we become familiar and embody both the space and the practices within it that enable automated driving the space becomes a lived, representational space of signs and subversions as we are able to break away, at least a little bit, from the space planned for us. In this new space we can drive "distracted", or engage in behaviors that might be considered by others as inappropriate without the sense of privacy and detachment that can be experienced in the car, for instance by dancing along in our seat to music in a way in which we would never dare on a train.

Indeed, when we are driving on autopilot the ways the space of the car can be utilized can make it appear to be something quite different from abstract space. Another form of space which Lefebvre (1991) identifies is

absolute space, an often pre-modern, or at least pre-capitalist, space. This is a once unique and natural space which has been appropriated by a lived space and transformed by symbolic mediation. It is also a space of, among other things, ritual and family as opposed to the abstract space's tendency towards accumulation. While the car itself is a product of this abstract space, for skilled drivers the space becomes converted into something which at least starts to approach this idea of absolute space. This is why, for example, the practices which take place within the space of a car are able to produce and sustain family in a way public transport bound up within abstract space cannot. The car provides a private space within a public flow. One can simply not gain the same sense of ownership over public transit systems because one is always aware that other people possess their own valid claims to the same space.

This space within the car has been shaped and facilitated through automated driving in the sense that it is the lived space we create through our practices which enables us to be subversive in a way that is not possible in conceived or perceived space. But automated driving, as described in this thesis, is not the same thing as the autonomous drive of the self-driving car. To remove control of the drive from the driver means the production of a new space and while some practices may still work, others will not. The car will not "car" in the same familiar way. When driving is not present, the car may become more firmly connected to the abstract space of the road. A failure to acknowledge the unique space of the present car speaks to one of the limitations with the way in which self-driving cars can sometimes be both promoted and discussed within advertising and research – namely a tendency to place a narrow focus on the car as a transportation device, especially for commutes (see Hendricks, 2016 and Tomita, 2017). This can cause the discussion around self-driving cars to become fixated on the themes of safety and convenience, usually defined as spending potentially less time in a commute with a greater flexibility to do things other than drive. And these activities are often presented as the solitary pursuits of more time to work, read, or perhaps watch a program. While these things would to a greater or lesser extent be relevant for all my informants, for whom their car served partly as a means of commuting to work or errands, it can exclude relevance to other forms of driving such as the ones earlier

mentioned which were neither solitary nor undertaken with any destination in mind. But also it risks underplaying the fact that for many drivers, including commuters, the question is often not an objective one defined in terms of exactly how many minutes they might be spending on their commute but rather the extent to which they feel able to manage and control their perception of time and scheduling through their vehicle.

The Car as a Time Machine

From the earliest introduction of the automobile associations have been made between the car and freedom. Sometimes this sense of freedom can be rooted in the symbolic and/or subversive as a form of liberation, for example that of the Swedish working-class subculture of *raggare,* analogous to the American "greasers", who relish(ed) in their affront to the norms and mores of the Swedish middle class through their embracing of the clothes and hairstyles of 1950s American rock to go along with their large, big-engined, and usually American automobiles of the Cold War-era (O'Dell, 2001). And sometimes freedom can be represented as a rather romantic form of escape and personal development, such as the rite of passage of the American road trip (Laderman, 1996).

But, often, it is simply interpreted as the freedom to move through physical space:

> "Uh, well I got my car in the first place for flexibility, to be able to get to some stables where I rode and looked after a horse twice a week. And to move between Lund and Malmö and some other places for my sales job, you know. It's not so easy now with the busses. Like, on the weekends if I want to go out in nature on some nice day I can either try to borrow my mom's car or I can always try to catch a bus but they don't go so often on weekends, and to nature, so I'm usually stuck around here. Those are the times I wish I had a car again, you know, for more convenience." (Interview with Malin, June 1, 2015)

In this case flexibility means to get from point A to point B - or for that matter from A to B by way of points C, D, and E -without needing to depend on the more rigid routes and schedules of the regional public

transit system. To not have a car is to be "stuck around", and to perhaps be unable to be at multiple places on the same day without considerable hardship, even with public transportation. If I was to ask an informant, whether American or Swedish, why they owned a car I would almost always receive an answer that it gave them more flexibility, or some variation upon this theme. And, if I was to then ask what flexibility through a car meant for them, it would generally be framed, as Malin does, as a form of "convenience". But in this case, I believe what is meant by convenience is perhaps more complex than might be immediately obvious.

Elizabeth Shove (2003) has observed that "convenience" is a word in which the meaning and significance have shifted over time. In the United States, at the turn of the twentieth century, it implied that a given consumer object was easy to use. By mid-century this had evolved to mean that an object was able to save its user time, which meant that time could be reapportioned from a less desirable or enjoyable activity towards a more desirable or enjoyable one. Today, however, Shove argues that convenience implies the ability to more effectively structure a day that can seem highly fragmented and constantly busy. In her example of the washing machine, she points out that while it demands a single period of close attention it then, once properly loaded and programmed, can be left alone with now a new block of time available for the next task of the day to be completed (p. 170).

This framing of convenience is also used to promote self-driving cars. A quick Google image search for self-driving cars only occasionally shows a driver actively engaged in observing their drive – and when it does it is usually in the form of emphasizing that the car is speeding down a highway while their hands are behind their head or sitting comfortably on their lap. Rather, the driver/passenger is more often seen engaged with life apart from the drive, often via their phone or tablet. One such stock photo shows a young woman gazing attentively into the screen of her phone, her cheek resting on the back of one hand and a smile on her lips while the words "autopilot mode" are projected on her front windshield. In another, we see an over-the-shoulder view of the same woman flipping through her phone while her seat is inclined back at an angle that would be unnatural for attentive driving. Her feet are close together and clearly not placed on any sort of pedal. Meanwhile, the blurring of the scenery along the road conveys

the impression of this relaxation taking place at high speed on a highway (see shutterstock.com, 2019). In both of these images the message is not only that the car has freed her to put her entire attention onto whatever it is she is clearly enjoying on her phone, but that this is also such an evidently routine and natural experience for her that she clearly is not in the least bit uncomfortable that the car is handling the entirety of the actual driving.

Hence, it would seem from this advertisement and the multitude of other similar adds, that it is clear that an autonomous drive vehicle is not meant to be solely a safer way of travel. Nor is it purely an easier way to travel. Rather, it is intended to give us more time in a day – or at least the power to use that time more to our liking. It offers a promise of freeing us from time spent "wasted" on driving. Unsaid is that it also perhaps removes the liminal capacity a commute at present has. Allowing direct shifts between home and work, in which the commuter is accessible to both family and employers at all time in the car, might impact whether this is desirable or not. Indeed, there is some evidence that it would not always be welcome given the way in which several informants would relate their habit of not answering their phone while driving if an incoming call was unwanted at that moment while admitting that they might occasionally take a quick call that they actually did wish to answer while on the road.

However, automation as it pertains to driving today can be utilized for this same purpose of manipulating or compressing time. It most certainly involves more than simply making the activity of driving simpler. It is, fundamentally a means by which we gain the ability, or the perception, of managing, controlling, and shaping time more to our will. In this sense the transport a car provides is movement not just through physical space but also through the temporal and turns the car, in a sense, into a time machine. In fact, I would go so far as to argue that when driving is performed automatically, it is more often than not directed towards the future. This is because, as Katz (1999) observes, a drive is never really an end in itself, but rather connects into a larger order for a driver (p. 351). This phenomenon is perhaps best illustrated here by the drivers Sandra and Emelie.

Speeding with Sandra and Emelie

Sandra and Emelie are both professionals in their 30s. Sandra is American, and Emelie is Swedish, but both say their biggest gripe about their lives is the sense of how little control they have over their time in that it seems as though there is always either something to do or something they are late for. And they both consistently feel that anytime they leave in the morning they are already a little late for an appointment for which they must arrive at a particular time, be it at work for an important meeting, or a doctor's office for an appointment. Sometimes they are even extremely late. Thankfully, they both also know how they have strategies to control and manage time in order to get to where they need to be sooner. One tactic they both utilize is to begin to adjust their adherence to traffic laws. Both of them are confident they understand the purpose of these laws and both are also confident that they know how far they can push the laws without too much risk of getting in trouble with the police or feeling that they are a danger to themselves or others.

While in the car on a ride-along, Sandra tells me that she has little rules she will follow, and she elaborates for me what she means by this. For one thing, she has heard that if you are only going 5 mph over the speed limit, and aren't in a school zone, the police won't ever bother pulling you over. So, 5 mph over the posted limit is her own personal speed limit. If the road says 35 mph she will more or less at all times go 40 mph. If it says 65 mph, she will go 70 mph, and so on. She loves that some states she has driven in have speed limits as high as 80 mph and there she will go, of course, 85 mph. But she is careful about school zones - both through fear of getting a considerably more severe traffic violation for a school zone infraction as well as out of concern for the children - and when she catches the traffic sign with flashing yellow lights alerting her to such a zone she slows down to whatever the posted speed limit is. But as soon as it passes, she accelerates back to 5 mph over the limit. She tells me that already this method gives her a feeling of getting anywhere she's going faster than planned, although she then reflects that it may be because she's gotten so used to doing it that now she has to travel at that speed to get anywhere on time since she might just be leaving later than she otherwise would. But if she's desperately late

she will occasionally push herself up to 10 mph over the limit, though she does not enjoy it at all because she's worried that she will get caught and ticketed. She says she would never even consider going 15 mph or more above and suspects that going that much over could end up being considered a traffic felony instead of just a ticket.

In Sweden, Emelie will also routinely speed but she tells me she has no real rule about it, just whatever feels alright. Usually, it is not very much over. But if she is on the uncrowded roads she often finds herself on, and comes to a stop where she feels it is very clear there are no other cars around, she will always perform a rolling stop, that is to say slowing her car to a low speed as though she is about to stop, looking both ways, and then accelerating through the intersection without ever quite coming to a complete stop. In our interview she tells me that the whole thing is "actually kind of funny":

> "I mean I guess there's a time game. I don't really have to be short on time [...] I think really it maybe makes me feel like I'm winning time or like saving time, a bit. Though I know it's probably not really true, it could be like saving a matter of a minute or two minutes or something like that that I save. But it feels good." (Interview with Emelie, May 23, 2015)

This speaks back to Shove's (2003) earlier observation that the actual amount of time being expended on a technologically facilitated chore is often rather less significant than the feeling that time is being controlled and sorted. The one or two minutes Emelie was saving were not particularly valuable in and of themselves since the difference between arriving somewhere roughly on time or unacceptably late never really came down to one or two minutes. What was valuable was the "winning" of more time for her day to be spent as needed, even if it might be so little actual time saved that she could not articulate how it was being spent. For Emelie the valuable part was the perception of control.

Almost every informant had some rationalized set of rules for themselves as to how much they would be willing to risk in order to save time. In the last chapter we saw how for Brian the amount of time saved could be considerably more than that saved by some other drivers due to a fairly aggressive approach to driving. This is partly a matter of his trust in his

own driving abilities. But also, as I mentioned in the recounting of our drive-along, he had trained himself to recognize marked and unmarked police cars for the county and state police where he lived and was familiar with where they often liked to hide to try and catch speeders. He is not alone in his interest in having this information as one can also download smartphone mapping apps in which strangers who also have the app will mark and alert you as to where hidden police speed traps are present at that moment of the day. And ever since I was a child in the U.S., I always knew that having headlights blinked at you by an oncoming car usually meant a warning that there was a police car hiding somewhere ahead. The police, even if admired and valued by a driver as an institution, were in the context of a drive a threat to be avoided and an unwelcome hindrance to being able to control one's own time in the car. And avoiding hidden police cars can be a communal effort that forms momentary bonds of solidarity with nameless and often faceless strangers who are unseen behind the wheel of oncoming vehicles or the screen of a smartphone.

However, all these tactics of gaining control over time draw upon the ability to automatically operate a car so that attention can be placed on the monitoring of information and strategizing the drive ahead. Brian, for example, would likely lack the focus to be able to scan carefully around his vehicle for hidden or unmarked police cars without the ability to drive in a manner in which he could rely on his embodied knowledge of driving to free his attention for other things. And Emelie's pleasurable feelings associated with winning time on a drive require the mental freedom to sit and reflect on the time she's saving while still driving.

While the in-the-moment actions of accelerating and decelerating, changing lanes, and making sure the car is remaining on the road are all being performed, a driver is often thinking some, or even very many, steps ahead. This could be in the form of contemplating the destination and how they wish to get there or scanning far ahead for potential danger so that they can take proactive and preventative steps to avoid it rather than be forced to react without preparation once trouble might actually occur.

While in one sense actions such as these may be seen as a quite active focus on the drive, they are still behaviors which draw upon the capacity to drive automatically in that, again, they involve being able to place enough

attention to plan ahead versus only being able to take reactionary actions to things which intrude on the drive. Rather than such advance planning representing breakdowns in the flow of a drive, it is instead another way to find means by which to utilize the flexibility and control afforded by the car in order to produce another valued element in their lives, such as time. The actual micro-practices of the drive are not so much brought into awareness as are the ways in which rules can be bent and/or time saved through driving strategies and tactics. But even the most skilled and experienced drivers can experience break points in which some form of friction does break up the flow of their drive. In this next section we will see how forms of friction can be experienced and the way they can impact the perception of the drive. But first we will return to the United States in order to see how a drive with heavy friction can be felt while in the moment.

Flows and Frictions

A Drive with Melissa

The upcoming winter weather forecasts for the Washington D.C. area were looking more and more dire. The mention that newsreaders were making of the potential for the "Blizzard of a Century", and their usage of the term "Snowmageddon", were not exactly reassuring me that I would be able to complete all the fieldwork I had hoped to during my limited time in Virginia. The storm was expected to hit within two days and I was in the process of trying to see which interviews might be rescheduled when Melissa presented me with the offer of allowing me to accompany her on a drive to do some shopping and to fill up her SUV's gas tank before the impending blizzard hit. The weather forecast for that evening called for a possibility of snow, but the expected accumulations looked pretty minimal and I was all too happy to get a little fieldwork done.

The drive to the mall was uneventful and I was kicking myself for spending so much of the time asking questions, and chatting generally, that my notebook was looking rather empty. We went inside the windowless shopping center and an hour or two passed as Melissa went about her

business. Later, upon exiting the mall via the revolving doors we are greeted by the sight of a parking lot covered in a thin white layer of snow with more flakes floating down around us. Melissa laughs nervously and mentions how much she hates driving in the snow, let alone at night. I am in the process of thinking to myself that it hardly seems like much snow when I take my first inadvertent slide across the deceivingly slippery parking lot which we both now realize is covered in what is actually a mixture of snow and ice. "This should be fun!" I recall saying to myself.

We pull ourselves up into the raised seats of her SUV and Melissa places the keys in the ignition, starts her vehicle, and waits a moment for it to warm up to a point at which she feels as comfortable as possible before attempting to leave the parking lot. At the same time, she begins calculating out loud what the easiest and fastest way to return home will likely be. She then reaches to adjust her seat, only to stop mid-way and then fidget briefly with her mirrors instead. "My husband is always messing with my settings" she tells me. Upon mentioning to her that the last drive the car had seen was our own trip to the mall she mentions that she isn't really sure why she checked the mirrors after all. "Force of habit" she concludes. In preparing herself mentally for a drive she is dreading, is she defaulting to familiar – and perhaps even comforting – rituals? It seems to me as though she wants a drive which she fully expected to be difficult and frightening to feel at least as routine and mundane as possible, and even the smallest familiar ritual might feel reassuring.

Though the mall parking lot is very well lit and almost empty she immediately flicks on her headlights. She is slightly incredulous that I would ask such a stupid question as to why she would do this. Obviously, she patiently explains, it is what you do – and are required to do – as soon as you start a car at night. Nighttime usage of headlights only when immediately necessary after a drive has already commenced is unheard of and a weird concept to her. Melissa then places her vehicle in reverse and backs out of her parking space gingerly. While placing the SUV's automatic transmission on "Drive" and stepping lightly on the accelerator, her vehicle's tires briefly lose grip and spin on the slush causing Melissa to look to her steering wheel to make sure her traction control is engaged. She expresses relief that there even is such a feature at all and says that she

would also be really terrified right now if her vehicle didn't have four-wheel drive capacity as well. Her previous car was a small rear-wheel drive sedan and she mentioned earlier how much she hated trying to drive it anywhere in the snow. She felt as though it could potentially lose control at any moment in such conditions.

Leaving the parking lot and entering the main road Melissa makes a point to drive slowly and deliberately, almost never breaking her intense gaze at the road ahead. Road conditions are such that everyone around us is driving at speeds very far below the posted speed limit and we soon fall into place behind a small sedan which is moving at a pace Melissa feels comfortable driving at; somewhere at least around ten miles per hour under the limit. Though in an earlier conversation she had remarked how much she enjoyed driving to music, she has never once made any attempt to turn on her satellite radio on this trip. As I make note of this it hits me that the radio was in fact on for just a few seconds as soon as Melissa started her vehicle back at the parking lot, but as soon as a song began playing, long before she had begun the process of leaving the parking space, she immediately flipped the radio off. I suspect this to be at least partly related to something she had also mentioned earlier in which she said she avoided distractions when she felt she really needed to focus on a drive, especially since she didn't trust the ability of her own senses as much as she once did when younger. But Goffman (2005) might also argue that this could also potentially be a face-saving act, one to assure her passenger that she intends to take this drive especially seriously.

Soon we both hear what sounds like a *swoosh* behind us and Melissa briefly breaks her stare, which has been fixated about two or three car lengths ahead of us on the road, to look to her left to see another SUV passing at perhaps twice the speed we, and the cars around us, are traveling at. "What an idiot! Thinks just because he has an SUV, or is so important, or something, that he can just go whatever speed he wants. He's going to kill someone" she remarks, not making any effort to disguise the anger in her voice, "**this** is why I hate drivers around here so much". At the point in which she says it we cannot actually see the driver and I suspect she says "he" because aggressive drivers are more often than not troped as male drivers. But as soon as the other vehicle is alongside us, I see that she is correct in her assumption.

She carefully begins to put a little more space between her SUV and the small car in front of us after we pass several cars that appear to have run off the road in the slick conditions. The anger from her previous encounter with the aggressive driver does not compensate for the actual chill inside the vehicle and Melissa reaches to depress the switch for her seat warmers and to turn up the heat blowing through the vehicle's vents in order to keep the compartment as comfortable as possible under the circumstances. She needs to focus right now and can't afford to be distracted by thinking about feeling cold.

A few more kilometers down the road and Melissa finds herself as the lead vehicle in a long line of slow-moving cars all trying to drive successfully on the now extremely treacherous roads. As she approaches a traffic light that has just turned red she presses on her brakes in the usual manner one would ordinarily take for granted would stop a car, only to feel them have almost no effect at all despite the slow, careful, deliberate speed she has been maintaining. She and I both experience a brief moment of extreme unease as we realize her SUV has lost its traction entirely and is sliding straight past the red light and into the four-way intersection in which the other road has the green light. Not knowing what else to do to protect herself under the circumstances she continues to press hard on the brakes hoping they will catch while simultaneously sounding, and holding, her horn as she looks down the intersecting road and attempts to spot incoming cars to make direct eye contact with. She hopes that this will be enough to warn any cars approaching that she has lost control of her vehicle and cannot stop and that they will be able to figure out that this is what she is signaling. Fortunately, there aren't any other cars approaching and the brakes eventually do manage to stop the vehicle almost halfway across the intersection. Deciding that stopping in the middle of the intersection would be stupid, and under usual and more familiar circumstances illegal, she decides to just keep going and clear the intersection despite the red stoplight.

After more than an hour of this slow, deliberate, and dangerous driving in what would ordinarily be a twenty minute or less drive Melissa finally pulls into the garage of her house and goes through the well-rehearsed, and much less eventful, routine of placing the transmission in "Park", engaging her parking brake, and turning off the vehicle. As soon as she yanks the key from

the ignition, she lets out a laugh that sounds to me like a mixture of excitement and relief. "Well **that** was fun," she declares in a sarcastic-sounding tone.

Clearly, Melissa's impression of the drive was not a positive one. She later mentioned just how frightening it felt for her in the moment. Her head was swirling with all sorts of images of things which could go wrong, but by far the most disconcerting aspect for her was the feeling that her usual sense of flow in a drive had been completely disrupted and that if she did not pay one hundred percent attention to every driving action she performed she could easily lose total control of her vehicle. Put another way, she simply could not experience driving in the familiarly embodied manner. It was most certainly still embodied, except this was an embodiment of the same sort of stress, fear, and uncertainty a beginning driver might experience while they were still unfamiliar with the movement and feel of driving. This precluded any possibility for the establishment of a sense of flow, which by extension also meant there was no moment at which the drive felt as though on autopilot to her.

As mentioned in the previous chapter, Merleau-Ponty (2012) argues that habits emerge through a bodily understanding of the world. What Melissa was experiencing was a degrading of her ability to make sense of the world. The repeated loss of traction, the sudden defamiliarizing of the feedback sensations coming from critical pieces of equipment such as the steering wheel and brakes, the muffled sounds, and the poor visibility all could have, and likely did, alienate her from the normally comfortable action of driving her SUV. And when that understanding of how basic pieces of equipment would respond to even gentle driving actions was broken it became impossible for her to draw on the embodied knowledge which necessarily underpinned her ability to drive automatically.

And, in addition to this, Melissa was also experiencing a disruption of her driving practices. The structure of practice is grounded in routines – routines which become established through a sequence of repetition over time (Reckwitz, 2002). In addition to defamiliarizing sensations, the icy weather was also blocking these sequences from being able to take place as expected. Stopping at a red light, for instance, would ordinarily involve a linked set of routinized and largely unreflected upon steps of action; gauging the distance at which to begin stopping, applying the

proper amount of brake to stop at the desired spot, retaining the foot on the brake while waiting for the green light, and so forth. On this particular night, that sequence could not take place. Unfamiliar conditions meant a difficulty in figuring out when and how brakes should be applied, and once Melissa did begin braking, she proceeded to lose control of the vehicle. This crisis put her in a situation of needing to quickly engage new practices, such as laying on her horn to try to signal a warning to other drivers, but as these practices lacked an established routine, they were inherently unstable. Automated driving would have been completely impossible in such a situation as this and a vehicle which has become defamiliarized to this degree is understandably perceived as dangerous. The consequence of this is that the recognizable practices and positive orientation she had built up towards both her car and the act of driving were broken for at least some period of time. This experience of having some form of a disruption of flow had been experienced by all of my informants as well, and there was a range of situations which could lead to it.

Breaking the Flow

For all informants inclement weather and/or night were, unsurprisingly, the first, prime, and sometimes only answers given for when driving felt especially dangerous. Both situations, in their own way, demand a high level of concentration from drivers. Deeply embodied knowledge of practices, such as just how firmly to depress the gas and turn the wheel in order to make a right turn onto a busy street, can turn into a spin out into traffic if performed without modification on an icy road. Likewise, a pitch-black night for a driver who feels they have a worsening ability to see in the dark as they age requires full attention towards what is going on and the readiness to perform a sudden adjustment if it seems the car is beginning to leave the sometimes dimly painted traffic lines on a dark road. In either case the opportunity to "switch off" thinking about driving is not afforded and one can become acutely reminded of just how dangerous a car can be. It is easy enough to say that since driving in bad weather and at night are objectively riskier times in which to drive that this is a purely

rational feeling. But what feels safe and what feels dangerous when driving is not always universally shared by drivers. One such example of this is the earlier example of the novice driver who struggled with merging onto a highway while more experienced drivers were able to perform the same action without effort.

This is not to say, however, that there are not certain moments in which driving with a focus on the drive is an enjoyable experience. These are often, in what may at first appear paradoxical, moments in which seemingly not entirely safe driving can come to feel quite enjoyable. For at least half of the informants I spoke with a certain element of danger could make driving even more enjoyable from time to time, especially if they were young or reflecting on how they felt when they were younger. On the drive along with Brian in the last chapter we saw he made a deliberate decision to take a curvy and narrow road rather than the wide and straight streets precisely because he enjoyed the extra challenge of staying on a road that might perhaps frighten other drivers a little.

Earlier in this chapter we also met Emelie who enjoyed gently pushing the speed limit in order to feel a small rush from the perception that she was winning just a little more time for herself in her day. But when she or other skilled drivers do this, they do it with the belief that they are competent drivers and that the risk of losing control of their own vehicle is not high, or at least does not feel as though it is high. Indeed, Brian himself stated that the one occasion many years ago in which he had taken an otherwise routine turn at an intersection too quickly, lost control, and hit a dividing wall alongside the road was, unsurprisingly, not something he found enjoyable in the least bit whatsoever. There is a fine, and rather dramatic, line between driving at the edge of what feels comfortable and experiencing a rush from pushing those boundaries with the car, and that of experiencing a frightening and deeply unpleasant loss of control in which the car is no longer a car but a vulnerable box of glass and metal we are trapped in. Straddling this line effectively involves a process of combining skilled practice with possibly intense, but controlled, emotional experiences in order to feel a thrill of being truly connected to the drive, a process which Stephen Lyng (2005) refers to as "edgework" (pp. 17-49). For Lyng, edgework is a term used to describe the concept that the purpose

of intentional risk-taking is to explore the edge of cultural boundaries, for instance the line between conceptions of safety and danger.

It is not uncommon for individuals to fantasize about being in risky situations, or in some cases even to actively place themselves in such situations. But the key to enjoying these fantasies is that the individual retains the ability to control just how far they go within the scenario (Ehn & Löfgren, 2010, p. 188). And these little chosen moments of extra risk and extra focus on a drive are exciting for some drivers precisely because they are deviations from their norm. In fact, they can reassure the driver that they possess a real skill at driving which can keep them out of trouble if they face an unwanted and unexpected situation on the road. Thus, some things which might ordinarily cause friction and break up the sense of flow on a drive are not always encountered by a driver as such, and there can be a situational aspect in how these moments are experienced. An unwelcome sense of friction is that which is not encountered by choice but is forced upon the driver.

Although an informant might say that he or she enjoys driving, this does not mean that they necessarily enjoy the micro-practices of driving. Indeed, within drives which are expected and experienced as routine, a heightened awareness of the practices of driving can be those moments at which driving is the dullest for informants. An example of this which nearly all informants brought up in interviews is that of having to drive in stop-and-go traffic. Without any experience of such traffic jams one could make a seemingly sensible argument that, maybe, this should actually make driving a little more interesting in a sense. Rather than just floating absent-mindedly down the road one now gets to drive tactically, weaving between crowded lanes and frequently adjusting speed - at least there is something to do. But such driving situations were experienced as precisely the opposite; that is to say as stressful and often numbingly boring:

> "Yeah, I really hate the traffic around here [in the Washington D.C. suburbs]. It's only getting worse. I have to travel down I-95 sometimes for work and yeah, it's always something there. You know that opening scene in that movie *Office Space*? Uh, it's like that. Like you watch one lane go a bit, try to move into it, and then it immediately stops while the one you were in is going. It's just totally boring. Can't stand it." (Interview with John, January 3, 2015)

John's experience of being in such a traffic jam never felt dangerous in any sense to him. The traffic was often moving so slow that bumping into another car, or being bumped, could do no real physical damage. But the stop-and-go traffic represents another form of friction which breaks up the flow of a drive. Once again, the need to refocus concentration to the car and the removal of the freedom to choose what to think about or engage in is an unpleasant one. A sense of control in such a situation largely disappears, at least in the sense of being able to move when and how one desires as well as a perception of control over when one can arrive at the destination. And this feeling of monotony can even disrupt the ability to focus on something else other than the traffic. In one traffic jam encountered on a ride-along with Sandra she, to her increasing frustration, kept replaying the track on a CD she wanted to hear because she could only remember it was playing just as it was ending while she was being distracted by the need to pay attention to her movement around the traffic. And she also became increasingly aware of just how sore her foot was becoming while being stuck in a situation in which she was unable to take her foot off the brake for even a moment in order to stretch.

Mihaly Csikszentmihalyi (1990) makes an important observation that a state of flow means that "attention can be freely invested to achieve a person's goals, because there is no disorder to straighten out, no threat for the self to defend against" (p. 40). Being out of flow means not just being unable to do what you want, but also requires deliberate actions to manage the situation. Part of what has made these encounters with friction so uncomfortable while driving is not only does it prevent the drive from being what a driver might wish it to be, it also forces a sometimes-tiring effort to regain the flow. A new set of driving practices must either develop around the situation, or kick in from past experiences, in order to gain control over the situation once it is encountered. In the case of Melissa this involved a set of practices which included cutting extraneous noise, focusing much more intensely on the immediate road ahead, communicating emergencies to other drivers through both her horn and attempted eye contact, and carefully observing how the car reacted to different ways of being handled within the treacherous conditions in order to determine what seemed to work. In this way

borders between what is acceptable or not acceptable are renegotiated and, while a drive can be continued, it will likely be unusually draining unless the familiar embodied flow is regained.

Sometimes, however, those moments at which seemingly nothing interesting at all is happening on the road can be experienced as the ones that feel particularly enjoyable to drive in:

> "Driving long distances like to the beach, and everything, is fun. Any place that's nice open road where you don't have to go speeding through, but you can just sit there and cruise is very nice. With a straight road all you're doing is looking in front and you don't have to think about what's coming around the next bend" (Interview with Tim, February 6, 2016).

> "I enjoy long trips. There's something about open highway where you can just go. When there's a lot of traffic that's no fun but if there's little traffic and I can hit like 65 mph or higher I find driving really fun" (Interview with Melissa, January 20, 2016).

Of course, it is not as though Tim or Melissa are sitting there doing absolutely nothing whatsoever. Part of what makes these road conditions so enjoyable for them is that they are precisely the conditions in which they are most free to employ their ability to drive on autopilot and put their attention for extended periods of often uninterrupted time on what they wish. Perhaps they will strike up a conversation with their passenger, or listen to the news on their radio, or enjoy the scenery, or just daydream for a while. In these situations, the experience of the journey to the destination is often as much an integral part of the trip as the destination itself as Broz & Habeck (2015) observed in their study of weekend road trips.

Ultimately, the embodied knowledge that permits the sense of flow behind automated driving is dependent on familiarized sensations and routines of practice. Driving can still take place when this flow is not present. A traffic jam does not prevent eventually arriving at one's destination, just as Melissa still arrived at hers despite the challenges involved in driving on an icy road. But as we have seen, when a flow is disrupted driving becomes something else, and certainly at least something which is not automated in the sense of how we have been encountering

automation in this thesis. Flow permits the car to become more than just a means for transportation, but friction introduces a break point which can interfere with, or even entirely break this up this crucial and valued flow.

Concluding Remarks

Within this chapter the objective has been to provide an answer towards the third research question of this thesis; namely, what does driving become once it is automated? The first section of the chapter has emphasized the way in which automation facilitates an embodiment of space. And far from being limited to a space of transportation, the car can also be used to produce spaces for daydreams, transitions, conviviality, family, and others. These varied forms of embodied space which can form when driving practices are themselves embodied to the point of automation are a part of what makes the car such a potent cultural symbol and one that people can feel highly reluctant to see changed.

In the second section we have seen the way in which automated driving can also become a means to gain a sense of control over scheduling and time. This is partly due to the ability to move between dispersed locations quickly without being tied to the timetables and fixed routes associated with public transportation. But it also just as significantly includes the capability to control perceptions of time by looking for opportunities and bending rules. The car's ability to do this enables some drivers to feel that they can adapt their driving in order to have better control, or at least a sense of control, over a particularly busy or stressful day.

And finally, we have looked at break points for the driving flows afforded by automation through the introduction of friction. I have argued that friction is that which kills automation and brings the micro-practices of driving back into awareness for the driver. Sometimes this might take a dramatic and frightening form of defamiliarizing the embodied experience of the drive, such as skidding out across an icy road. Other times it can take a tiresome form of stop-and-go traffic consuming a driver's focus and energy. When friction is encountered, drivers will fight to find a means to regain at least some sense of the flow which can permit automated driving to continue.

Flow is that desirable state in which in which driving is experienced as automated and a driver is free to place their attention where they wish. This could take the form of daydreams or perhaps socializing with a passenger. It is also a state in which driving feels and can be described by informants as, comfortable, safe, and perhaps even sometimes fun. Friction is the antithesis of this. In redirecting attention firmly back onto the drive it can remind a driver just how much driving can be dangerous and/or boring.

In investigating automation in driving in this manner I again seek to contribute towards research on the cultural context and experience of everyday driving. I have sought to show that ultimately driving is valued by drivers not only because it provides a convenient means of transportation, but even more so because of the possibilities the car affords to become a meaningful, and often enjoyable, space to a skilled driver and their passengers. This comes back to an important point made earlier in this thesis that it is flawed to conceptualize driving as a single isolated practice. Any research which fails to account for the many forms of *drivings* which a driver may engage in will only be able to understand, at best, a portion of how an individual experiences and values driving as a concept.

Conceptualizing, and arguing for driving to be conceptualized, as something experienced as though automated or otherwise through the flows and frictions which are encountered on the road serves to work towards deepening this understanding of driving. These perceptions of flow and friction rely on a consideration of both the car and driver and the constant interaction which occurs between them. A sense of flow for a driver cannot occur without the car feeling and behaving as has come to be expected, and the car behaves as expected because a driver has already established an embodied knowledge of what is routine and which sensations feel comfortably familiar and reassuring. When a flow is present on a drive then driving can be experienced as tolerable or even fun and requires little effort or energy to be expended than might otherwise be called for. Conversely, friction demands immediate attention to be met and, hopefully, overcome. And this friction is not always something external to the vehicle. As we have already encountered in the third chapter, a piece of technology, ostensibly meant to be helpful, can be devalued and disregarded when it fails to find a place in this flow of a normal drive.

Chapter 5
The Automation of Driving

Today it appears that the next major turn in driving will be the introduction to the market of vehicles which are fully, or at least partially, made autonomous through technology. Already a considerable, and growing, amount of literature is being produced in both academic and popular literature which seeks to understand how self-driving cars might successfully be introduced and how consumers will respond to them (e.g. Geldmacher et al., 2017). But what some of this literature tends to take for granted is a belief that autonomous drive technology will introduce a revolutionary new step in redefining driving and the way we understand the car. Perhaps this may be so, but if we are going to try to understand what driving will become through the technology, we must first try to understand what driving already is and has been in a serious manner.

At the beginning of this thesis I introduced three research questions to explore how driving might already possess an existing experience of automation. These three questions were 1) How has the car developed in a manner which facilities, or hinders, automation? 2) In what ways can driving be understood as having become automated at present and what role does the technology of the car play in this? And, 3) What does driving become once it is automated? This final chapter will summarize what has been shown in the empirical chapters of the thesis towards building an answer to these three questions by recapping what has been argued in regard to both the process behind the automation of driving as well as the consequent effects. It will then conclude by arguing the relevance this has in shaping the way in which people will orient towards future forms of the car.

Automation in Everyday Driving

One very short, but also key, observation towards understanding how driving comes to be automated is that it develops over time. Understandings of the role of the car and driving, and how driving is meant to be experienced, have been developing for over the past century of the development of the automobile. And throughout this time drivers have had the opportunity to experience, adopt, adapt to, or reject a range of forms of automation offered by technologies in the car.

By the 1910s car ownership had become a realistic possibility for many Americans. While these early vehicles may have lacked many of the features which we take for granted in contemporary cars, such as electric starter systems and powered windshield wipers, their advertising did begin using the metaphors which would long hold sway over expectations of how a drive was meant to be experienced. One wasn't supposed to bump unpleasantly down a road – no doubt a common experience given the state of many of the roads at the time – but rather to "float" across it.

And this floating was facilitated by taking what was originally often little more than an outdoor chair on powered wheels and beginning a process of isolating a driver from the outside world through technology and design. Springs cushioned the bumps of the road, while detachable tops allowed, to some extent, all-weather driving. In this way, technology made driving, even for some distance, seem practical. And as the car increasingly became a comfortable and private space for the family it took on the form of an interior and private space capable of moving through exterior and public realms. But this was also a carefully managed and engineered interior space and one which sought to balance which sensorial experiences were welcome and which were not. An engine, for example, should hum, but it shouldn't scream or be silent either.

A car was also a space in which what was possible, or at least acceptable, was shaped by class and gender. In part this was a question of money. Then, as now, the more money one could afford to spend on a car the more options one would have both in what sort of car one wished to drive as well as what technologies or materials might be present to smooth the experience of driving. But it could also be shaped by the norms and values

of wider society, as illustrated in the family bonding that was expected to be possible in a touring car as well as the moral threat that could be represented by a single male, or female, driver.

By the 1950s an idea had become firmly established in society that technology was meant to smooth away frictions and contribute towards the development of an ideal of the friction-free life through new advances in automation, such as push-button driving. Cars were now not just meant to float, they were said to "fly", or even "rocket". Sometimes they were even to suggest movement while standing still through the usage of forward-swept chassis designs. Automatic transmissions and power steering contributed further towards this smoothing of frictions by aiming to clear driving of any "unnecessary" actions and movements. But not all such technology was successful as Ford found to its detriment when the placement of the Edsel's Teletouch drive system conflicted with its driver's powerful pre-existing driving practices and expectations.

Today many of these ideals remain similar, even if the complexity and capabilities of the technology to assume control over parts of a drive have developed substantially. I have argued that this reflects a process of evolution not just of the car but also of the driver, as the relationship of the driver to their car shifts from seeing the car as a tool to that of the car becoming a partner, or even a "co-pilot", as it assumes increasing responsibility for the mechanics of driving. Each shift along this trajectory can have an effect on how the car is used and perceived as new practices can be facilitated while old practices become obsolete or impossible. The point is an important one to bear in mind in that while it may not be possible to say with any certainty exactly how any self-driving cars of the future will be received, it is possible to say that a further shift in the relationship between a driver and their car will disrupt some of the existing practices of driving as the understanding of what driving is and is meant to be changes. However, even if self-driving vehicles are not yet on the market, I have sought to argue that a form of, and relationship to, automation can already be facilitated through embodied practice. Within this thesis I have understood this relationship between a driver and their car as being a sort of driver-car assemblage, as defined by Dant (2004), in which both draw and depend upon one another. This relationship has an

effect both on shaping practices as well as molding the orientation towards cars and driving. If the intent is to introduce new vehicles which may significantly alter the lived and experienced space of the car, then it is useful bear in mind that not all of these changes may be welcomed, or even broadly accepted, by drivers.

Drawing on Merleau-Ponty (2012) I have also argued that perception is experienced through the body. Routines and practices orient a driver and this orientation produces understandings which are much more than just cognitive. And, in addition to this, they tend to be held as a form of tacit knowledge that is hard to elicit through some methodologies such as interviews or questionnaires. Yet it is precisely this sort of embodied knowledge which needs to be understood if we are to understand everyday driving and how it is already automated.

To some extent this sense of embodied automation is developed through a mastery of the physical motions necessary to drive a car successfully as well as a familiarity with the senses and feelings associated with driving. But just as crucially it involves being able to sufficiently understand the driving situations within which these things take place. Earlier, to illustrate this point, we saw the example of a novice driver who was entirely capable of driving her vehicle on a highway but lacked the capacity to instantly read complex driving situations. In this particular case that situation was being able to determine when there was enough space to merge onto the highway, and how to properly accelerate to seamlessly fit into the gap, and she consequently violated a widely understood yet not discussed culture of merging. The consequence of this was having to face an angry driver, who signaled their anger through their own driving practices, and her own loss of face as a driver. An ability to internalize and effortlessly perform proper driving norms and behaviors was what marked a "good" driver from a "bad" one. To be a skilled driver is often to be largely an invisible driver, passing through traffic unnoticed and easily forgotten by others.

But when these components of driving have become sufficiently embodied and understood, they can transform a driver into a skilled driver for whom the flow of a drive can pass by so unnoticed that it becomes for all intents automated in the way in which it is experienced. This skill also leads to a situation which might initially appear to be something of a

paradox in that the more comfortable a driver is, the more likely they seem to be missing certain things around them or not able to notice or be able to articulate what they're doing. But this is because learning to drive automatically is also learning what can and cannot be safely ignored in order to avoid overloading with extraneous information and impressions. This learning process can sometimes be one of learning through observing which driving actions or behaviors may lead to a loss of face in front of others. And sometimes it is one of experiencing a drive through the body and gaining, over time, an understanding of how the vehicle reacts to things and how certain situations feel through the car. In this way a competent driver becomes a craftsman, in Richard Sennett's (2008) sense. Such a driver possesses an ability to draw on their embodied knowledge in order to drive successfully. And while this ability is grounded in a mastery of routinized practices, the element which makes it a craft is the capacity to understand and modify these practices as necessary to meet a range of situations and challenges. Mastering one's own vehicle, and understanding its place on the road, permits an ostensibly complicated action, such as the aforementioned highway merge, to be conducted with relative ease.

And in addition to this embodied automation drivers will also find ways to work with many of the forms of technology already present in their vehicles. In doing so they come to form an assemblage with their vehicle's technology in which both they and the technology are necessary for a drive to happen in a flow. This means that a driver becomes skilled and comfortable over time with their own specific vehicle so that a very skilled driver might still be thrown into some level of discomfort should they be placed in a vehicle which possessed a significantly different perspective on the world through height, or the feel of the tightness of the brakes, or some other equivalent variable.

Existing forms of automation may also be used to facilitate embodied automation. Many drivers feel entirely comfortable, or even prefer, handing over control of some driving functions to their automatic transmissions, GPS systems, cruise control, or other similar features. However, if this technology breaks the flow of the drive by behaving oddly or misleading the driver then, especially if it has not already been routinized, it is likely to instead be rejected outright and ignored or deliberately

avoided in the future. This illustrates the manner in which well-embodied and practiced routines are important towards establishing a positive orientation towards a technology which, in the case of driving, is experienced as ideally happening within a flow.

The Experience of Automation in Driving

Once a driver has developed the embodied ability to drive their vehicle automatically, they are capable of transforming their vehicle into spaces for more than just transportation. A solo drive in flow might be used in order to daydream, decompress, imagine, and plan a future event or relive a previous memory. For a commuter, driving often becomes an opportunity to provide a quiet and solitary mental transition between their home and place of employment during which they can prepare for the coming switch in social roles, or have an opportunity to enjoy a little time alone and away from the attention required of a boss or a spouse. That such a transition between places, or at least a transition in this form, can occur is because of an ability to drive automatically. The experiences of driving along a familiar road, a physical separation from both the family and co-workers, and a state in which one is alert enough not to fall asleep but can still handle a drive while relaxed, creates for many informants an ideal situation for solitary thought and daydreams which enables the commute to become a liminal moment in transitioning between home and work or vice versa.

And when others are present in the car with a driver, the car can become a space of social production. These social interactions are mediated through the design and operation of the car and this presents a unique framing, in Goffman's (1986) sense, of a shared understanding between driver and passenger of what is and is not possible or desirable when socializing in a car. A pleasant sense of physical proximity is not only possible but required within the limited physical space of a car for those individuals one is already comfortable with. Yet an acceptance of behaviors which might otherwise be marked as peculiar in other spaces – such as long pauses in conversation or a lack of direct eye contact – can help ease potential social discomfort if a passenger and driver are not well acquainted.

By the same manner the car as a unique space can also play an important role in the production of family. Most typically this might take the form of chats with a son or daughter on the way to or from school or an after-school activity. But it can also take more unusual but certainly no less significant forms, such as the family who would take their young children for long late-night drives in order both to put the children to sleep as well as to provide the parents with a quiet moment together to chat. Privacy within the car, and suppression of the noises outside, combined with seats placed closely together, means that neither whispering nor shouting is necessary to communicate. And the orientation of the body facing forward and restrained against the seat means both that the people inside the car are to some degree captive but also that communication can take place, as mentioned, without as much concern for things that might otherwise be construed as awkward or uncomfortable in a sustained and face-to-face conversation. In such a way the car has an ability to play with the boundary between abstract and absolute space in a way that public transit does not. This is part of why a car, and the positive orientation which many individuals have toward their car, is about more than just concepts of convenience. Radically altering the physical space of the car, for instance with a seating system which no longer requires a driver and their passenger to be facing forwards, would alter or even eliminate some of the practices described in this thesis around driving, at least within the way they are presently understood and experienced.

Another phenomenon facilitated by automatic driving is the ability to utilize tricks, plans, and sometimes technically illegal driving tactics in order to gain a perception of control over time, further enhancing the perceived convenience afforded by the car. For individuals who feel they are often late to important appointments, this can provide a calming sense that they have a means to ease the stress of the situation, even if they recognize that they are probably saving only very little time by taking the actions that they do.

But all of these roles that a drive can serve when automated are dependent on the driver being able to maintain a sense of flow, in which everything is passing more-or-less as expected, no unfamiliar sensations are present, and attention can be placed elsewhere. The car can very quickly revert to

being once again "only" a car once friction is introduced to the drive. This friction is often experienced and felt as uncomfortable, exhausting, and/or sometimes even frightening. In bringing the car and the drive into sharp focus it can present a discomforting reminder of the dangers inherent in driving a car in those situations in which something about the drive or the car is not functioning as experience has taught that it should. And when it is necessary to pay deliberate attention to a certain aspect of a drive, or the surrounding environment that can usually go ignored, the experience can quickly become tiring and/or boring.

Sometimes the friction encountered on a drive can take on a particularly unusual or severe form. This could be something like a major mechanical failure or, as in Melissa's example from Chapter 4, a drive through the aftermath of a winter storm in which what are normally familiar embodied sensations became made disturbingly unfamiliar. Other times a friction may come by way of a more mundane but still uncomfortable and tiring event such as another driver on the road behaving inexplicably or encounters with a stop-and-go traffic jam. But in whatever form the friction takes, drivers will struggle to regain their sense of flow. Flow is significant because it is the state in which a car is "car-ing", in the Heideggerian sense from earlier in the thesis. This is the state in which the bodily sensations mediated through the car feel familiar, in which driving can feel remarkably safe, and in which the car can produce relaxation, entertainment, friendship, family, or something else besides just mobility. When a skilled driver experiences this state of flow it can feel as though the drive itself is taking place automatically.

Orienting Toward the Future

Although fully self-driving cars have not yet hit the market as of the time at which this dissertation has been published, the tenor of reporting, advertising, and general interest in these cars has not changed significantly since my research began. Frequently, the self-driving car is portrayed as something which will spark a revolution in how we experience driving. Indeed, a simple Google News search for "self-driving" together with "revolution" returns over 78,000 results as of late 2019. Drivers are promised

by some that self-driving cars will introduce a range of benefits to their lives; from being significantly safer, or more convenient, or more environmentally friendly than a standard car. And indeed, they may well prove to be all of these things in comparison with contemporary cars.

Earlier in this thesis I spoke of the argument put forward by Sarah Ahmed (2004) that it is not only the impression we have when we encounter a new object which will shape our feelings towards it, but also the pre-existing orientations which have been inculcated by years of experience with the same or related objects. A fully self-driving car might operate very differently from a car at present, but it will still be perceived initially through the lens of a lifetime around cars that every Swedish or American driver has established. Drawing on the research questions which were proposed at the beginning of this thesis, it is possible to make a few observations about how these present understandings of driving can shape the way in which drivers perceive self-driving automobiles.

Firstly, as we saw in Chapter 2, the way in which a car is able to facilitate automatic driving at present has been over a century in the making through a process of incremental changes. And each of these changes came about through a two-way relationship between car manufacturers and driver/consumers. The expectations of consumers have shaped the expectations of what a car is supposed to be while the car in turn has shaped the consumer into a driver with an often strong and highly skilled orientation towards driving. An example of this process encountered earlier is the way in which better insulated vehicles led to the emergence of the phenomenon of the Sunday drive in the United States which in turn led to an impetus for designers to create the family touring car for these drives. Likewise, the successful introduction of new automotive technologies could shape idealizations of what driving should be, as illustrated through the metaphors attached to driving, such as floating or rocketing. And today, the orientation of many consumers towards a desire for environmental friendliness has contributed towards a "greening" of the car as well as a frequent emphasis on environmental-based arguments for the benefits of autonomous drive vehicles made by the proponents of the technology.

I believe that, at least in the case of my own informants, a perception of an absence of a two-way dialogue with developers of autonomous drive

technologies is in part responsible for some of the reservations expressed towards self-driving cars. This is not to say that my informants expressed a desire to communicate directly with automotive manufacturers about their wants and needs, or to take part in the design and development of self-driving cars. Rather, there could be a perception among them that self-driving cars were coming not because they as drivers had a problem with cars today, or that a self-driving car would be better able to fit into their lives, but instead because someone else just told them that they were coming.

One potential consequence is that instead of viewing a self-driving car as a natural evolution of the car, there was a tendency to orient towards them as some other form of technology that they seemed to somehow better fit with at present; for instance as something like a new form of computer. I was, for example, told by Maja when discussing her impressions of autonomous drive cars: "You expect a person to make mistakes sometimes right? But not a computer, a computer is very precise, calculations down to the decimal point, you know? If it can't do one calculation right then you don't really trust it to do any" (Interview with Maja, August 3, 2015). Therefore, reports of self-driving car accidents and mishaps damaged her impression of such vehicles even though a news story about a regular car accident would not affect her opinion of driving at all. A driver makes mistakes, and the risk of these mistakes is an accepted part of driving. Small and inconsequential driving errors might even disappear as a part of the flow of driving and go unnoticed or unremarked upon. But if a self-driving car is perceived as not being driven, but rather calculated, along the road then it is for the time being not understood as a form of driving per se and as such it feels unclear for some as to what such a flow might feel like once established, or how to establish such a flow in the first place.

As we have seen in this thesis, this sense of driving in a flow is the basis behind how driving can become automated at present. Without the capacity to seemingly turn off much of the thought and effort that is required to drive successfully, driving would, and occasionally does, become tiring and even overwhelming. As such all informants, regardless of their own opinions on what the ideal car might be or how they felt about driving, sought to establish a sense of flow in their drives in which minimal effort or energy is required to drive in a manner that, barring a sudden emergency, feels

completely safe; or at least safe enough for them to continue using the car. The reception of automated driving technologies is often predicated upon their ability to support and maintain this flow. This is true on the micro-level among my informants who utilize those technologies which they are able to form practices around, and has also been true on the macro-level as seen in the failure of the Edsel which, among other things, contained a range of technologies which were never able to stick in everyday practice and routine. What is skilled and routinized can be utilized with little to no thought necessary. It can even sometimes become so integrated into the way a car or a drive is understood that it becomes invisible. Such has been the case with electric starter motors which, rather than be perceived as automatic, are simply perceived as how a car starts as the memory of hand-cranking a car has long since faded from general practice.

It seems that at least some process of adjustment would be necessary for a driver before they could re-establish this same sense of flow in a fully autonomous vehicle. If we think of driving as being a flow established in and through everyday life, then the irony is that an autonomous car is not yet experienced as automatic. In Chapter 3 we saw how even a relatively slight change in a driver's perspective of the outside world and connection to the road caused by new encounters with a vehicle higher or lower than the one which had been familiarized by them could for some time prohibit a sense of flow, and even produce feelings of unease, until movement and new practices were able to establish and embody new experiences and orientations linked to the new vehicle. No matter how typically car-like a fully self-driving car might be in appearance, it is still going to shake up perceptions and alter some practices for their drivers for a certain period of time. Because of this, it may well be the case that the more incremental the steps toward fully autonomous cars are, the more likely they will find acceptance among drivers. In both the examples of the Ford Edsel and the non-usage of cruise control among some contemporary drivers we have seen how significant changes from expected driving practices and experiences can often be avoided or even rejected when the choice is possible.

This is part of why I suspect most informants felt less trepidation at the initial idea of a partial self-driving car than a fully autonomous one: "I mean, I'd really, really, like it if I, like, could hit a button and have my car

sort of see for me in the snow, or rain, or whatever and make sure I stay on the road" (Interview with Lena, April 9, 2017). Similar observations were made by other informants who felt more immediately comfortable with the idea of the car as a more involved co-pilot than themselves as only a passenger. Such visualizations are also ones which the informant can at least hypothetically link into their existing driving practices. Drivers are already familiar with both the idea and practice of assigning unwanted tasks to technologies present in their car. For instance, Lena had earlier joked in her interview about the number of times she had ended up on strange and seemingly illogical roads when travelling to an unfamiliar destination because she was too trusting of her car's not-always-up-to-date GPS system. An occasional unusual detour was a price that she was willing to pay in order to not have to navigate to new destinations by herself. In this case, the value of the technology is its ability to maintain, or re-establish, a sense of flow in those situations in which the driver may have already lost it anyways, for instance by becoming lost on a drive.

The third question we asked at the beginning of this thesis was what does driving become once it is automated? In Chapter Four we saw how at present automatic driving permits the car to become a unique space capable of producing experiences which can range from providing a transition between home and work to the bonding of family. This occurs both through being able to drive in a flow, as well as by establishing a familiarity with what practices are possible, or not possible, within the physical space of the car. While new understandings can certainly become possible, accepted, and perhaps even highly valued as self-driving cars find a place in everyday life, it would not seem to be a definite thing that all forms of such a change would be entirely welcome. For example, the relaxed sense for many drivers of not feeling compelled to worry too much about direct eye contact or long pauses in speech between a driver and their passenger on a drive would not be possible in the same way within a self-driving car in which there might be no excuse not to sustain and hold eye contact as you might have to with a guest in your home. Or, the valued period of solitude for some driver-commuters on their commute could become disrupted at the will of others once the expectation is established that they have no excuse not to be working or taking a phone call on their

fully automated drive. Instead of being a liminal period which provides a bridging of two different spheres, the commute might then be compressed into something in which there is no real period of private time which is not within the realms of home or work. While certainly not all changes to driving would be viewed as negative, as indeed changes to driving have been a constant process through time, it is still worth remembering from the previous chapter that those drives which are experienced as unpleasant are often those which stand out in some manner as being outside the flow of driving. In this sense it is imperative that a driver be able to establish new flows around this new type of space created by the self-driving car, and embodied sets of practices which fit.

It was certainly not the case, however, that views among my informants towards self-driving cars were uniformly negative or even necessarily skeptical. While several informants speculated that perhaps younger drivers would be more receptive to the idea of a self-driving car than older drivers due to a perception that they would be more comfortable with cutting-edge technologies, in fact the opposite tended to be the case among the people I interviewed. The older an informant was, the more likely they were to express positive views about the potential of self-driving cars to me; a finding which is in line with what some quantitative studies into the subject have encountered (see Pak, Rovira, McLaughlin, & Baldwin, 2017) and the opposite of the findings of others (see Schoettle & Sivak, 2016). Indeed, the only informant to express unreservedly positive views of the thought of self-driving cars to me was also the oldest informant: Marilyn, an American driver in her 70s who explained to me that "I'd really love to not have to drive myself anymore, you know? I need to so I do […] but I hate it. Especially at night I feel like I can't see anything anymore. I'm sure a computer wouldn't have the same problems." (Interview with Marilyn, December 20, 2014). This theme of a decreasing trust in one's own driving senses with age was also felt by Victoria, a Swedish informant in her 40s, who said that while she had fun driving when she was younger, it starts to feel more and more scary for her the older she gets as she feels less capable of seeing at night and in the frequent Scanian rain (Interview with Victoria, September 29, 2015). When it is not possible to establish durable flows on even the most mundane sorts of drives then there is little to no flow to lose

by handing over the driving process to the car. While depictions of self-driving cars may frequently depict people who appear to be younger and able-bodied, it might well be those who are incapable of, or physically uncomfortable with, driving who may feel they have the most to immediately gain by a future with self-driving technology.

And, of course, cultural differences will also to some degree shape how drivers from different communities are oriented towards these new cars. While the physical and outward practices of driving between my Swedish and American informants were by and large very similar, and both could and would experience driving as though on autopilot once they became skilled and comfortable drivers, the values and expectations attached to both cars and driving could be quite different between the two at times. This was especially true in the sense that driving was perceived as a fundamental and necessary part of life by all American informants, whereas for the majority of Swedes I interviewed it represented more of a choice in that if the complications a car introduced, such as the associated upkeep costs or annoyances with city driving, exceeded any perceived benefits over utilizing available public transportation then some informants had no particular qualms about selling their cars and giving up driving for a time. Differences such as these could mean that initial receptions of, and reactions to, fully self-driving vehicles could vary, even if both American and Swedish drivers experienced automatic driving in a similar way. For instance, if suddenly every car on the road was to become self-driving today, my American informants felt that they would have little choice but to adapt as alternative transportation methods were insufficient or unavailable to them. In contrast, most Swedish informants felt that biking and public transport could suffice if there was no car available that they wished to own and thus they were confident that they could give up cars if it felt sufficiently necessary.

Ultimately, it seems premature at present to be definitive as to whether self-driving cars will be a positive and/or successful development to driving, or a negative and/or unsuccessful one. Not only will many new developments in areas including technology, law, and infrastructure need to be made and integrated well enough for the cars to work on a large scale, but also, barring any government intervention mandating autonomous

drive, the first generation of driver-passengers is going to need to embrace the vehicles and find a place for them in their everyday lives. And, at present, one might only speculate as to what new practices and understandings would develop around the autonomous drive car once it enters large-scale usage and the potent utopic and dystopic imagery that is swirling around them fades into the banality of those taken for granted daily routines that can simply feel mundane. But in ten years it is likely that Melissa and Brian will still have no shortage of places to go, things to do, and lives to lead – whether they are driving their car or their car is driving them; either way just another automated aspect of their life.

Svensk sammanfattning

Både bilägare och passagerare upplever ofta bilkörning som en rutinmässig aktivitet vilken inte är särskilt uppseendeväckande. Men det är just vardagligheten i sig som gör detta fenomen så anmärkningsvärt. För att uppfattas som en bra bilist krävs det att vederbörande utför flera olika fysiska moment på ett genomgående och smidigt sätt i ett stort fordon som förflyttas i hög hastighet på en potentiellt starkt trafikerad väg. Det vore egentligen inte konstigt om en bilist skulle känna sig överväldigad av upplevelsen.

Ändock antar bilen för många människor egenskaperna av ett vardagsrum med kaffemuggar, musik och bekväma säten varifrån man kan prata med en vän. Det är lätt att känna sig så hemmastadd, att jag, och många personer som jag har pratat med, har upplevt att vi tappade bort oss i våra tankar så mycket att vi kom fram till resmålet utan att vara särskilt medvetna om hur vi ens kom dit eller vad som hände på vägen. Ibland känns det som vårt sätt att köra redan är automatiserat. Denna bok handlar om hur denna känsla av att köra på 'autopilot' uppstår.

Bokens första kapitel presenterar de teoretiska koncepten och metodologin i avhandlingen samt ger en översikt över tidigare litteratur och presenterar avhandlingens mål. Det övergripande syftet med avhandlingen är att, med hjälp av kulturanalys, förstå hur körning är automatiserad i nuvarande vardagspraktiker, samt vilka implikationer detta har för hur man upplever körningen. Målet med detta är att förstå hur de befintliga upplevelserna av automatisering kan forma bilförarnas orientering gentemot nya körupplevelser. Därigenom avser jag att bidra till forskning inom områdena praktik-baserade studier och mobilitetsforskning. Min avhandling har följande tre forskningsfrågor:

1. Hur har bilen utvecklats genom tiderna på ett sätt som främjar (eller hindrar) automatisering?
2. På vilka sätt har bilkörande blivit automatiserat i samtiden och vilken roll spelar bilens teknologi i detta?
3. Vad händer med bilkörning när den har automatiserats?

För att besvara dessa frågor använder jag mig främst av de teoretiska koncepten practice, perception och embodiment. Dessa koncept används för att analysera det empiriska materialet som har samlats både i Sydsverige och vid USAs östkust. Den största delen av materialet härstammar från 21 semistrukturerade intervjuer och fem tillfällen vid vilka jag följt med informanter på bilfärder runtom i städer och förorter. Dessutom använder jag mig av historiskt reklammaterial som har insamlats i universitetsarkiv och på internet för att visa hur automatiserad körning har utvecklats genom tiderna.

Bokens andra kapitel presenterar dessa historiska perspektiv på körandets automatisering. Istället för att ge en fullständig översikt över bilhistoriens automatisering visar jag hur processen kan äga rum genom att undersöka två transformativa tidsperioder för bilen i USA. Dessa tidsperioder är 1910-talet, när bilen blev ett vanligt och prisvärt transportmedel och efterkrigstiden, det vill säga 1950- och 1960-talet, när bilen blev en oumbärlig del av amerikanskt förortsliv och när många automatiserande teknologier som vi använder idag introducerades och/eller populariserades.

Under 1910-talet börjar vi se idealet av en "friktionsfri" automobil. Eftersom automobiliteten inte längre var ny blev tillverkare tvungna att hitta sätt att särskilja sina bilar och att skapa nya köideal som deras fordon kunde leva upp till. De engelska metaforerna 'insulating' och 'floating' undersöks för att visa hur tidiga bilar skulle upphäva friktionen i körandet. Nya teknologier och färdigheter skulle användas för att kontrollera hur en bil rörde sig på en väg och hur mycket motorn hördes i fordonet. Tillsammans med bilar som var anpassade för att köra i olika väderlägen betydde detta att en bilist allt mer kunde ta sig var som helt och när som helst. Detta skapade möjligheter för nya former av körning, såsom söndagsutflykter med familjen, och detta började också skapa en ny typ av utrymme inom fordonet, vilket ledde till att bilen blev till mycket mer än bara ett nytt transportsätt.

Under 1950-talet ser vi hur bilen anpassades till efterkrigstidens sällskapsideal. Nu uppfattades bilen inte enbart som "framsvävande" eller "framglidande" på vägen, utan den skulle "skjuta" genom rymden och skapa intryck av rörelse även vid stillestånd. Att upphäva friktion kunde också, med hjälp av nya teknologier och design, knytas till idealet av 'tryckknapps-körning'. Bilister började uppskatta många av dessa förändringar, såsom automatisk överföring och servostyrning i amerikanska bilar. Jag visar dock också hur dessa nya teknologier ibland kunde krocka med etablerade körpraktiker, som man såg i misslyckandet av Ford Edsel och dess Teletouch drive system.

I de följande kapitlen diskuterar jag nutida körning. Det tredje kapitlet fokuserar på hur körande kan uppfattas som automatiserat i samtiden och vilken roll teknologier kan spela i detta. Jag argumenterar att körande kan upplevas som om det vore automatiserat av skickliga bilister, genom att de utvecklar och förkroppsligar körpraktiker. Att utveckla dessa praktiker och färdigheter innebär inte bara att lära sig hantera den mekaniska utrustningen av bilen utan också att lära sig vad som kan ignoreras både i bilen och på vägen. På grund av detta kan en bilist som verkar vara för fokuserad på vägen uppfattas som en dålig förare av andra. En 'bra' förare kan köra som om bilen vore på 'autopilot'.

Automatiseringsteknologier, såsom automatisk överföring, används regelbundet av förare för att köra automatiskt, men endast när föraren kan utveckla rutiner runt dem. Farthållare har tjänat som ett illustrerande exempel för detta. För vissa bilister kan farthållare minska den fysiska belastningen av en lång körning på en motorväg. För andra bilister medför det att bilen tycks bete sig på ett okänd och obehagligt sätt, och farthållare används därför inte ens i de situationer som teknologin har utvecklats för.

Fjärde kapitlet undersöker vad körning utvecklas till för en bilförare när den har automatiserats. Jag visar hur automatiserad körning medför att bilen kan bli mycket mer än ett transportutrymme. Den kan också bli ett utrymme som producerar dagdrömmar, övergångar, familj, etc. Dessa olika former av förkroppsligat utrymme som kan formas runt automatiserad körning är en del av det som gör bilen till en mäktig kulturell symbol - en symbol som människor kan vara motvilliga att se förändras.

Detta kapitel visar också hur automatiserat körande kan användas av föraren som ett sätt att få en känsla av kontroll över tiden. Automatiserat körande kan ge föraren möjlighet att t.ex. söka en snabbare resrutt till målet eller att kunna kringgå trafikregler. Även om en förare inser att dessa strategier enbart sparar några minuter körtid kan de minska stress och ge en känsla av att ha kontroll över tiden.

Kapitlets avslutning undersöker varför automatiserat körande uppskattas så mycket av bilister genom att undersöka situationer där det inte är möjligt att köra automatiskt. Jag argumenterar att automatiskt körande skapar en känsla av flöde där allting under en bilfärd känns normalt och till viss utsträckning osynligt. Friktion i form av oväntat körbeteende från andra, trafikstopp, eller dåliga väderförhållanden kan bryta detta flöde. När automatiserat körande inte är möjligt blir körning i stället särskilt tröttsamt och ansträngande.

Det sista kapitlet sammanfattar vad som framkommit i studien och visar hur upplevelser med automatiserat körande kan forma orienteringen som bilister har gentemot självkörande bilar. Jag argumenterar att ett möjligt problem i nuläget är att bilister kan uppfatta en självkörande bil som någonting annat än en bil, t.ex. genom att jämföra den med en dator. Till skillnad från en mänsklig förare förväntas en dator inte göra några misstag. Detta innebär att det inte finns någon etablerad förkroppsligad känsla av flöde i en självkörande bil och att man kommer behöva etablera nya former av flöde i ett sådant fordon. Jag argumenterar att ett sätt att minska detta problem skulle vara en stegvis förändringsprocess som ger föraren tillfälle att skapa nya praktiker och rutiner.

Ett annat problem som identifieras i kapitlet är att bilen har etablerats som ett väldigt unikt utrymme i de senaste hundra åren. Att frigöra en bilist från att behöva manövrera sitt fordon kan skapa nya sätt att använda sig av körning, men samtidigt utesluter det andra möjligheter. Exempelvis är de sociala relationerna i en bil för närvarande bestämda av att det inte finns konstant ögonkontakt och att pauser i ett samtal därmed känns mindre konstiga än i de flesta andra sociala situationerna. Detta medför att bilen för vissa förare känns som ett särskilt skönt ställe för samtal med passagerare. Att förändra det fysiska utrymmet av bilen och att ta bort behovet att köra kommer också förändra det sociala utrymmet i bilen.

Avslutningsvis försöker jag inte argumentera att självkörande bilar kommer vara en framgång eller ett misslyckande. Många faktorer som inte kan kontrolleras av en enskild aktör kommer att avgöra huruvida de är framgångsrika. Men jag argumenterar att framgång ur förarens perspektiv kommer att definieras av möjligheten att skapa nya praktiker och nya former av flöden i självkörande bilar. Snarare än de utopiska och dystopiska associationer som självkörande bilar framkallar hos många idag, kommer deras framgång framöver bli en delvis osynlig del av det vardagliga livet, så som skett med den nutida bilen.

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