

2018

Fear of Change: Autonomous Vehicle Technology and the Automobile as a Cultural Artifact

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Recommended Citation

Shoemaker, Alexis, "Fear of Change: Autonomous Vehicle Technology and the Automobile as a Cultural Artifact" (2018). *Scripps Senior Theses*. 1192.
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**FEAR OF CHANGE: AUTONOMOUS VEHICLE TECHNOLOGY AND THE
AUTOMOBILE AS A CULTURAL ARTIFACT**

by

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**SUBMITTED TO SCRIPPS COLLEGE IN PARTIAL FULFILLMENT
OF THE DEGREE OF BACHELOR OF ARTS**

**PROFESSOR SEO YOUNG PARK
PROFESSOR JOANNE NUCHO**

20 APRIL 2018

Acknowledgements

I would like to begin by thanking Professor Seo Young Park and Professor Joanne Nucho for their support and insights throughout the past year of research. Their constant encouragement to reflect and engage more deeply with my work stretched my analytical eye and pushed my investigation to unforeseeable places. I would also like to thank Professors Segal, Johnson, and O'Rourke who awoke my profound appreciation for the field of anthropology. I would like to thank all of my interlocutors for their invaluable participation and for revealing the remarkable complexities of the automobile. Lastly, I would like to thank my friends and family for their willingness to listen to a year of nonstop car talk.

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Introduction

Automobiles are omnipresent, whether their presence is seen, felt, heard, or traces of their existence lies in the objects with which we work, the automobile touches nearly every aspect of our lives in a way few artifacts are able. Human technologies are “inseparably meaningful, social, and material”.¹ As humans we infuse the technological artifacts that we come into contact meaning while simultaneously extracting meaning from those artifacts. These significations are constantly in flux, oscillating between utilitarian and symbolic functions. “Technology is a most decidedly cultural phenomenon that encompasses far more than the physical form from the material world from one state to another”.² In contemporary life, these technologies inhabit sociotechnical systems the nature of which is of ever increasing complexity. Our activities and interactions with these technological artifacts make up nearly inescapable material culture in which most everyone on earth is embedded to varying degrees. Today, “technology in its various manifestations is a significant part of the human world. It’s structures, processes and alterations enter into and become part of the structures, processes and alterations of human consciousness, society, and politics”.³

One new technology that has taken hold of the nation’s attention, and the focus of this thesis, is autonomous vehicles. This technological advancement places complex computers in vehicles with the ultimate goal of enabling the car to drive itself with more accuracy and precision than a human ever could. Also called driverless or self-driving cars, these automobiles are designed to travel without a human operator. Simply put, these vehicles use a combination of systems to make sense of and navigate the world around them. These technologies include

¹ Marcia-Anne Dobres, “Meaning in the Making: Agency and the Social Embodiment of Technology and Art,” in *Anthropological Perspectives on Technology*, ed. Michael Brian Schiffer (New Mexico: New Mexico Press, 2001), 49.

² *Ibid.*, 48.

³ Langdon Winner, *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought* (Cambridge Massachusetts, 1977), 6.

LiDAR, GPS, cameras, and radar all of which provide the raw data that is then run through complex algorithms in the car's internal computer. Resulting from all of this is a car that is able to control its own movements without human input. While the actual technology is highly complex, this research is more interested in the way technology is socially and culturally perceived and the impact that it could have on transportation culture.

This technology and the early perceptions of what could come of it are the focus of my research. In this thesis, I explore automobile culture through macro-level popular discourse and then through the narratives of my interlocutors. Currently, this technology is a large topic in the media, the coverage of which involves heated debates and hasty predictions. While this is a widely reported-on discourse, there remain gaps, the largest of which offer momentary ideological windows through which we are able to see the nuanced relationships that individuals have with their cars and the complex social interactions that take place within the vehicle. Though the popular discourse does acknowledge the automobile's complex involvement in everyday life, the vacancies regarding the individual and social relationships with the automobile allow for unique insight into the vehicle's level of sociocultural embeddedness in our lives and corrects the assumptions in popular discourse of the car as a tool and a commodity rather than a cultural artifact. Furthermore, the discourse forgets that it is not simply about changing whether you drive or don't drive; rather, autonomous technology has the power to fundamentally change the way that we live and the infrastructure of our lives.

For the purposes of my research it is necessary to define a few terms that I will use throughout my analysis. I will use 'autonomous vehicle,' 'AV,' 'self-driving car,' and 'driverless car' interchangeably. All terms are in reference to a vehicle that is capable of driving itself on all roadways in all conditions. Unless specifically noted, when I reference these terms the vehicles lack a steering wheel and are driven entirely by an internal computer system. I will also use the term 'autonomous vehicle technology,' 'driverless technology,' and 'self-driving technology' in

reference to the technology in the cars that make them capable of autonomous driving. When I speak about ridesharing companies they will be referred to as mobility service providers (MSPs). This is a service that allows people to hail a vehicle that is a part of a network of vehicles via a web browser or on a mobile application. These rides can be private or shared with either friends or strangers. The vehicles that are a part of MSP networks belong to the individual drivers who sign up to offer their services. However, as self-driving cars hit the road, the cars used by MSPs could be fleets of vehicles owned by a single company rather than the various individual drivers. It is important to note that MSPs are projected to be the first major industry in which driverless cars will enter our transportation repertoire in large enough numbers to fundamentally change the way in which we view mobility.

Research Questions

In this thesis I explore automobile culture and in doing so I endeavor to fill the gaps in popular discourse, focusing primarily on social implications of driverless vehicles as the technology looms on the horizon. My research questions that I will address in the subsequent chapters are as follows:

- What is the existing macro-level public discourse with regard to self-driving cars? What emerge as important issues and leading views with regard to autonomous vehicles as portrayed by the media and how do they set out polemic debates about consequences, that do not regard complex and nuanced fears and anxieties people have about autonomous vehicles?
- What are the unique, individual, personal, and emotional relationships that individuals have with their cars and how does this add a layer to the macro-level discussion? What do these people's narratives reveal about their fear of autonomous vehicles threatening their relationship with their cars?
- What are the fears associated with social relationships in the private-turned-public space within the car? How do people see themselves approaching the autonomous car as a public space that is simultaneously private and intimate? How does this add a more detailed layer to the macro-level discussion?

These research questions are organized into three chapters, my first chapter lays out the macro-level popular discourse and reveals the multitude of ways that autonomous vehicles, as commodities, are embedded in our lives. These debates offer a temporary portal through which we are able to understand the complex relationships that individuals have with their automobiles as culturally imbued artifacts. My second and third chapters focus on people's narratives through analysis of in-depth interviews. The second chapter is centered on the highly individual, distinctive, and psychological relationships that individuals have with their cars and the ways in which this reveals elaborate perturbations about how driverless cars could change or challenge these relationships. The third chapter concentrates on the car as a sociocultural space that is currently primarily private but which is facing a shift into the public sphere because of driverless technology. The intimacy within the car and the social interactions and relationships that take place there expose the uneasiness about the reshaping of the automobile. Chapters two and three make clear that the automobile is far more than its technical functioning, more than its practicality and usefulness as a tool or commodity. These chapters redefine the automobile as a culturally saturated artifact affixed in our everyday lives. An artifact that is facing a technological transformation that challenges the ways in which it currently exists.

Methodology

In order to understand the early perceptions of autonomous vehicles from a macro and also micro level, I approached my research on two fronts. First, I surveyed and analyzed popular discourse in the news and media. Second, I interviewed adults from a variety of backgrounds who regularly use their cars for everyday commutes in cities that are not particularly transit connected.

My online research of popular discourse took place between February and March of 2018. The sources that informed my analysis include the following: *CNN Money*, *The Journal of Consumer Research*, *MIT Technology Review*, *CNBC: Tech*, the *New York Times*, the *Washington Post*, *Business Insider*, *Wired*, *Forbes*, *PRI's The World*, *Lifehack*, *Yale Climate Connections*, *Victoria Transport Policy Institute*, *BBC News*, *Scientific American*, the *Guardian*, and *Fox News*. I collected data from an array of sources because I wanted to ensure that I was achieving an accurate macro-level view of the frequently discussed issues. To find these sources I searched keywords such as “driverless cars,” “autonomous cars,” “self-driving cars” in Google and from those results I selected my articles.

The interviews that I conducted all took place over the phone with individuals over the age of eighteen. This research is narrow in scope but offers a glimpse of the perturbations regarding how driverless technology could transform the automobile. This portion of my research took place from October 2017 to March 2018. I spoke with eighteen people over the course of my research. Seventeen of these interviews are included in the final draft of my thesis. There were twelve female participants and five male participants. All of my interlocutors were given pseudonyms to protect their identity. The interviews were semi structured which allowed participants to bring up topics that they felt were important. Over the course of these interviews there were times in which I would ask more pointed questions in order to lead the discussion in one direction or another if we were getting off topic, but I would usually allow my interlocutors to speak about whatever came to mind within the confines of predetermined topics. I chose this interview method because of the liberty with which my participants could direct the conversation.

The field site for my research was a small liberal arts college an hour east of Los Angeles. My interlocutors are individuals who attend the liberal arts college or who are from the Pacific Northwest. I selected my participants from my personal contacts and I was connected

with others by various friends or family members. My interviews allowed me to understand the multitude of perspectives and narratives that people have regarding their cars and the sociocultural aspects of the space within the vehicle. Some of my interlocutors have had varying levels of contact with autonomous vehicles through their work and when they are introduced I detail their connection with the industry. The participants who are a part of the automotive or technology industry provide valuable insights about the direction of the technology. These individuals also represent normal drivers and are able to furnish information about their personal experiences with cars as well. Simultaneously, the detachment that most of my interlocutors have allows for commentary and perspectives that are based only on imagination and existing experiences with cars that require a driver. This lack of experience is important because it enables this small group of individuals to exemplify a larger group in some ways. In other words, it allows for the content of chapters two and three to be representative and applicable to a far larger population.

Theoretical Framework

Anthropology has viewed the subject matter of technology not as “performance characteristics, objects, or even their physical life-histories; rather [as] the meaningful contexts of social interaction, negotiation, and contestation accomplished through the medium of artifact production and use”.⁴ The idiosyncratic employment of technology and the complex differences of these applications across cultures as well as the development of such technologies is of particular interest to anthropologists as a facet of our human culture. “The anthropology of technology must comprehend social relations and the social context(s) of material production, cultural values, and traditions simultaneous with the corporeality of what humans experience

⁴ Marcia-Anne Dobres, “Meaning in the Making: Agency and the Social Embodiment of Technology and Art,” 54.

when materially modifying and using the object world”.⁵ The importance of considering social relations and the social contexts in which a technology is embedded is of fundamental importance to my research because it is this facet of the advancement of transportation technology that offers depth and layers to larger analyses.

Ethnographic research of the automobile, as a facet of technology culture, takes on an amalgamation of forms. From the study of the cultures of classic cars, car collectors, automobile modification and personalization, racing and countless other topics, anthropology brings to light important aspects of automobiles as a part of human social life both historically and presently. “Car ideology, like many elements of culture, is inevitable to us because it is what we see *with* rather than *what* we see. Like a set of chrome-tinted contact lenses, the frames of thought with which we have been raised structure and limit our most basic perceptions: of how we get around, what to spend money on, what kinds of risks are acceptable, [and] where to live”.⁶ Furthermore,

“until this recent intrusion of the automobile into the traditional spaces of anthropological inquiry, the discipline has paid scant attention. This is despite the car’s centrality to public health and environmental problems, to the production of the modern subject, to the making of social distinctions and inequalities, and to the contemporary international political economy”.⁷

Understanding the car’s place in human culture, specifically in the United States, is important due to its centrality in our cultural repertoire. “From its earliest days, much of the automobile’s appeal had rested with the opportunities it has afforded for recreation, adventure, and fun”.⁸ The automobile has, however, resulted in much darker outcomes as well. Issues of importance in the study of the negative side of automobile culture include, but are not limited to, the following:

⁵ Ibid., 54.

⁶ Catherine Lutz and Anne Lutz Fernandez *Carjacked: The culture of the automobile and its effect on our lives* (New York, NY: Palgrave Macmillan, 2010), 43.

⁷ Catherine Lutz “Cars and Transport: The Car-Made City” in *A Companion to Urban Anthropology*, ed. Donald M. Nonini (Oxford: John Wiley & Sons, Ltd, 2014), 142-143.

⁸ Rudi Volti, *Cars and Car Culture: The Life Story of a Technology* (Baltimore, MD: Johns Hopkins University Press, 2006), 60.

“resource depletion, climate change and environmental degradation involved in the manufacture and use of cars; the global political economy of their production and distribution; and the intense local problems, anxieties and pleasures sustained by car consumption. Which is to say nothing about the cultural significance of the car, for it can be no coincidence that the United States is home to both the ‘freedom’ of the ‘road movie’ and the ‘conservatism’ of the suburb”.⁹

The call for research focused on the cultural meaning of the car is acutely necessary. This is especially true at the current historical moment, because we are precipice of what could be a massive change to the way in which we transport ourselves and our goods. As Skibo and Schiffer say, “One cannot study people apart from their things and, conversely, as engineers [and others] are beginning to fully appreciate, one cannot study things without considering people”.¹⁰ It is at the intersection of material culture, humans, and technological advancement that my research resides. An intersection that can be understood through in-depth interviews and ethnographic research.

Examining the automobile as a cultural artifact requires the definition of the object in the larger context. Brian Larkin offers such a framework. His definition of objects as infrastructures applies to the way in which the automobile will be dealt with henceforth in this thesis. Larkin argues that “infrastructures exist as forms separate from their purely technical functioning, and they need to be analyzed as concrete semiotic and aesthetic vehicles oriented to addressees. They emerge out of and store within them forms of desire and fantasy and can take on fetish-like aspects that sometimes can be wholly autonomous from their technical function.”¹¹ Viewing the automobile in such a way enables its examination outside of the context of its use as a mode of transportation. It allows us to view the automobile as a culturally charged sign and symbol rather

⁹ Eamonn Carrabine and Brian Longhurst, "Consuming the Car: Anticipation, Use and Meaning in Contemporary Youth Culture," *The Sociological Review* 50, no. 2 (2002): 181-182.

¹⁰ James M. Skibo and Michael Brian Schiffer, "Understanding Artifact Variability and Change: A Behavioral Framework," in *Anthropological Perspectives on Technology*, ed. Michael Brian Schiffer (Albuquerque, NM: University of New Mexico Press, 2001), 139.

¹¹ Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42 (2013): 329, doi: 10.1146/annurev-anthro-092412-155522.

than a purely technological entity. As I argue in this thesis, the significance of the automobile is so much more than its technical functions, rather, it is a set of cultural associations and meanings. Thus, Larkin's definition of infrastructure permits the analysis of the automobile in a new context that lives outside of its original purpose as transportation.

Technology is often thought of as a panacea of sorts. In other words, a techno-fix that has the potential to improve even the most dire of situations. While it is irrefutable that technology has the power to ameliorate circumstances, as Newton's Third Law states, for every action there is an equal and opposite reaction. Mick and Fournier, in their 1998 research, applied this law to technology in society. The study itself defines "a new conceptual framework"¹² based on "consumer cognizance and experience of technology paradoxes and associated coping strategies".¹³ This framework explains the often unintended antithetical consequences that arise from technology. These negative consequences are usually camouflaged by their positive counterparts and only emerge after widespread or long-term adoption of a technology. Some of these repercussions include chaos/control, freedom/enslavement, competence/incompetence, efficiency/inefficiency. These antithetical consequences of technology are important as we move into discussing innovations in autonomous vehicle technology because they illustrate the complex nature of technological advancements while also offering a framework with which we can conceptualize and compartmentalize the conversations about technology taking place in this thesis.

Research on popular discourse revolving around a futuristic subject proves a difficult endeavor due to the reliance on collective imaginations based on prior experience. As Mikael Wahlström, PhD in social psychology said,

¹² David Glen Mick, "Paradoxes of Technology: Consumer Cognizance, Emotions, and Coping Strategies," *Journal of Consumer Research* 25 (1998): 123.

¹³ *Ibid.*, 128.

“It is suggested in general that public imagination, along with media discourses and societal settings that contribute to explanations, should be considered in the design and study of automated systems. It is also discussed that the social representations approach could be beneficial for media frame studies by providing explanations as to why certain frames might have or lack cultural resonance.”¹⁴

The futuristic nature of my subject matter aligns with the framework established by Wahlström.

Additionally, the reliance on imagination in the study of public discourse makes the

“methodological and theoretical discussion of the issue of public imagination”¹⁵ difficult.

However, it is possible, as Wahlström demonstrates, through a mixed-methods approach of

participants responses and media analysis. Furthermore, as Denis McQuail, PhD, a

communications theorist said, “people in audiences construct for themselves their own view of

social reality and their place in it, in interaction with the symbolic constructions offered by the

media.”¹⁶ It is these approaches that I take to my research, first establishing the macro-level mass

media coverage and then bolstering the discourse with social science and individual participant

insights.

Technology as a topic of study often intersects with the study of fear of innovation. Dr.

Mordini, who champions responsible research and innovation in Paris, offers the argument that

“fear of technology mainly emerges from a lack of meaning surrounding the technology

revolution. Present technology is developing without a sound cultural framework that could give

technology a sense beyond mere utilitarian considerations.”¹⁷ This theoretical framework allows

us to work through the public fear of technology and establish the cultural underpinnings needed

to ground the technological functions of the automobile in the face of innovation. Additionally,

similar to Larkin’s argument, Mordini explains that, “today, technology is justified only by

¹⁴ Mikael Wahlström, "How to Study Public Imagination of Autonomous Systems: The Case of the Helsinki Automated Metro," *AI and Society* 32, no. 4, January 28, 2017, 599, accessed April 12, 2018, doi:10.1007/s00146-017-0689-4.

¹⁵ Ibid.

¹⁶ Denis McQuail, *McQuail's Mass Communication Theory* (Thousand Oaks, CA: SAGE Publications, 2005) 461.

¹⁷ Emilio Mordini, "Technology and Fear: Is Wonder the Key?" *TRENDS in Biotechnology* 25, no. 12 (2007): 544, accessed April 12, 2018, doi:10.1016/j.tibtech.2007.08.012.

utilitarian considerations. Yet human beings are hardly ‘utilitarian machines’, they are rather ‘symbolic machines’. They need meanings to give a sense to their life. What is more frightening for any human being is ‘non’ sense rather than ‘bad’ sense.”¹⁸ The semiotic nature of human understandings of the world illustrates the importance of making sense of the symbolic aspects of the car as a cultural artifact. Mordini’s call for sense-making through a focus on the symbolic context in which an object is embedded is vital to my research. Furthermore, the symbolic coping process “by which individuals come to render new technologies or scientific achievements intelligible”¹⁹ as defined by Wolfgang Wagner, PhD, illustrates yet another way in which humans establish collective imaginations “that then allow an acceptable level of understanding.”²⁰ My analysis of the automobile as a culturally imbued technological artifact involves the investigation of the coping processes that saturate the vehicle with symbolic meaning. It is through Wagner and Mordini’s theoretical frameworks that I am able to define collective narratives and establish an anthropological body of symbolic meanings that are associated with the automobile.

Conclusion

To explore the case of autonomous vehicles on automobile culture as it exists, my thesis consists of three chapters. The succeeding pages are organized as follows: first, I establish and analyze self-driving cars in popular discourse, this chapter establishes the autonomous vehicle’s current media presence; then, I will examine the relationship with cars that my interlocutors currently have, this chapter demonstrates the importance of the vehicle and the narratives that individuals have with regard to their vehicle in everyday life; finally, I will discuss the social

¹⁸ Ibid.

¹⁹ Wolfgang Wagner et al. "Collective Symbolic Coping with New Technology: Knowledge, Images and Public Discourse," *British Journal of Social Psychology* 41 (2002): 323, accessed April 12, 2018, <https://onlinelibrary.wiley.com/doi/pdf/10.1348/014466602760344241>.

²⁰ Ibid.

space within the vehicle and the complex nature of the car as a site for sociocultural happenings. Through this, I argue that the automobile is far more than its technical functioning. Rather, it is and should be widely considered a culturally saturated artifact that is deeply embedded in our everyday lives in complex and far-reaching ways. My analysis of the culturally informed symbolic nature of the automobile as illustrated by my interlocutors ultimately reveals perturbations about the multiplicity of ways in which the meaning of the automobile could be transformed by driverless technology.

1 Self-Driving Cars in Popular Discourse

Introduction

Discourse on self-driving cars in popular culture is crucial to understanding the early perceptions of the impact of autonomous vehicles on the American cultural landscape. New technologies often reveal antithetical consequences, many of which only become apparent after the technology is widespread. Autonomous vehicles are no different. We are currently engaging in a considerable amount of prophesizing about what is to come as a result of this new technology, and taking the temperature of public discourse exposes a number of major conversations occurring on local and national levels. There is a common view of a techno-fix, the notion that technology will ameliorate unsatisfactory situations. However, generally any technological innovation has ramifications on society that are equal and opposite. Though the future is unknowable, fleshing out the issues that surface and resurface in news articles and other media outlets is valuable due to the massive societal changes that self-driving cars could bring about. We are currently poised at an interesting point in history because we are able to study, first-hand, the conversations that are taking place with regard to a technology that has such a massive transformative potential. The discussions in the media emerged in six categories. Within these topics live the antithetical consequences of vehicular innovation.

The conversations and public discourse at this time focus primarily on the potential for significant job loss or industry creation, the possibility of sustainable transportation or the further destruction of the environment as a result of gasoline emissions, the likelihood of the creation of exurbs that reach far beyond suburbs, the prospect of a revolution in transportation safety as well

as the dark side of putting your life in the hands of a hackable computer, debates with regard to laws and legal issues associated with technological development and culpability, and the issue of cost increases or decreases as this new method of mobility emerges. These themes show various possible scenarios and they reveal the wide range of societal aspects that autonomous vehicle technology is related to. However, as I argue, though these topics set out polemics about the consequences of driverless cars, they do not regard the complex and nuanced fears and anxieties that people have about the technology. It is in this vacancy in the discourse that I insert my research. But, before that, let us review the current major conversations occurring in public discourse as of March 2018.

Jobs and Employment

Technological advances notoriously cause uncertainty in the job market. When industrialization hit the United States, numerous job sectors were destroyed as a result. However, those working individuals who were displaced, found new work on factory floors and, with some retraining, many were able to maneuver a new economic landscape. Potential for the same or a similar outcome is likely with the rise of automation. “Jobs that require only a high school degree, or involve repetitive tasks”²¹ are predicted to be in the most danger. “Experts say that one of the most at-risk occupations is driving.”²² This is due to the predicted efficiency and affordability of autonomous vehicles, qualities that some say will make them “preferable to human-driven cars and trucks.”²³ Furthermore, “concerns about disruption have triggered some to call for a universal basic income, as a safety net to protect workers who aren’t able to find new

²¹ Matt McFarland, “Driverless Cars and Your Job -- CNN Tech,” CNN Money, accessed February 23, 2018, <http://money.cnn.com/technology/our-driverless-future/robots-are-coming-for-your-job/>.

²² Ibid.

²³ Ibid.

work.”²⁴ However, prognostications of just how many jobs could be lost vary widely.²⁵ These predictions “range from optimistic to devastating, differing by tens of millions of jobs even when comparing similar time frames.”²⁶ It is this level of uncertainty that many news articles latch onto in an effort to determine exactly what fluctuations the job market the United States is facing when automated technologies, particularly self-driving cars, enter the workforce.

Though there is significant unpredictability in terms of the job market 10, 20, or even 30 years down the road, many articles that I found focused on the potential for immense job loss across the country. This focus is illustrated by a 2020 Presidential candidate, “Mr. Yang, a former tech executive who started the nonprofit organization Venture for America, [who] believes that automation and advanced artificial intelligence will soon make millions of jobs obsolete - yours, mine, those of your accountants and radiologists and grocery store cashiers.”²⁷ In an interview with the *New York Times* he said,

“All you need is self-driving cars to destabilize society... we’re going to have a million truck drivers out of work who are 94 percent male, with an average level of education of high school or one year of college... that one innovation, will be enough to create riots in the street.”²⁸

Though Mr. Yang may sound alarmist, his “doomsday prophecy echoes the concerns of a growing number of labor economists and tech experts who are worried about the coming economic consequences of automation.”²⁹ With the potential for such a large volume of job losses it is likely that the social, political, and economic landscapes in the United States could

²⁴ Ibid.

²⁵ Eric Winick, “Every study we could find on what automation will do to jobs, in one chart,” MIT Technology Review, January 25, 2018, Accessed February 22, 2018, <https://www.technologyreview.com/s/610005/every-study-we-could-find-on-what-automation-will-do-to-jobs-in-one-chart/>.

²⁶ Ibid.

²⁷ Kevin Roose, “His 2020 Campaign Message: The Robots Are Coming,” The New York Times, February 10, 2018, Accessed February 22, 2018, <https://www.nytimes.com/2018/02/10/technology/his-2020-campaign-message-the-robots-are-coming.html?rref=collection%2Fsectioncollection%2Ftechnology>.

²⁸ Ibid.

²⁹ Ibid.

change drastically. Even if this technology does not come to complete fruition other automation technologies pose similar threats though perhaps not as large as self-driving cars or trucks.

Though “the full impact of self-driving cars on society [could be] several decades away”³⁰ Anita Balakrishnan, a writer for *CNBC: Tech*, asserts that “when autonomous vehicle saturation peaks, U.S. drivers could see job losses at a rate of 25,000 a month, or 300,000 a year, according to a report from Goldman Sachs Economics Research.”³¹ Goldman Sachs, however, is but one institution. In fact,

“the most commonly cited numbers [for projected job losses] were from three places: a 2013 Oxford study that said 47 percent of U.S. jobs will be automated in the next few decades, an OECD study suggesting that 9 percent of jobs in the organization’s 21 member countries were automatable, and a McKinsey report from last year [2017] that said 400 million to 800 million jobs worldwide could be automated by 2030.”³²

The ubiquity of citations from so few organizations and from various years is startling because it illustrates the potential for confusion and the spread of erroneous or old information with regard to the U.S. job economy and the global job economy. Furthermore, other cited materials “emanate from a wide array of studies released by companies, think tanks, and research institutions”.³³ As a result of this variety of source materials coming from so many organizations, it is difficult not only to verify the validity of the predictions but also to determine what is most correct on a continuum. However, when a figure or prediction is repeated across many outlets it would be remiss to ignore them.

Trucking is one such case, emerging as one of the most at-risk jobs in the face of self-driving vehicles as predicted by the organizations mentioned previously. Mr. Yang echoed this sentiment, and it is reiterated in various other news stories. Illustrative of this preoccupation,

³⁰ Anita Balakrishnan, “Drivers could lose up to 25,000 jobs per month when self-driving cars hit, Goldman Sachs says,” *CNBC: Tech*, May 22, 2018, accessed February 22, 2018, <https://www.cnbc.com/2017/05/22/goldman-sachs-analysis-of-autonomous-vehicle-job-loss.html>.

³¹ *Ibid.*

³² Eric Winick, “Every study we could find on what automation will do to jobs, in one chart.”

³³ *Ibid.*

Vivek Wadhwa, author of *The Driver in the Driverless Car*, writes about the trucking industry's potential fate, saying, "widespread adoption of autonomous vehicles will eliminate the jobs of the millions of Americans whose living comes of driving cars, trucks, and buses (and eventually all those who pilot planes and ships)."³⁴ The elimination of jobs in the transportation sector could result in large social and political upheavals as people are left stranded without livelihoods. Anita Balakrishnan in her article for *CNBC: Tech* also writes about this idea, saying, "truck drivers, more so than bus or taxi drivers, will see the bulk of that job loss, according to the [Goldman Sachs] report. That makes sense, given today's employment: in 2014, there were 4 million driver jobs in the U.S., 3.1 million of which were truck drivers, Goldman said."³⁵ The prospect of these hard working individuals losing their jobs is frightening to say the least. When that possibility is combined with the statistic that Mr. Yang cited with regard to their education level, the U.S. could see a large population of unemployed individuals who have few skills that could translate into another industry without retraining. As one article puts it, "it's tough to teach an old dog new tricks. And not every mid-career worker will have the time, money or desire to retrain themselves. Those who don't, risk irrelevance."³⁶ This irrelevance as a result of the potential obsolescence of trucking and other vehicular transportation jobs represents one of the most frequently mentioned issue in news articles about self-driving cars.

With the potential for massive changes in the employment landscape as a result of autonomous technology, Vivek Wadhwa perfectly sums up the possible outcomes that we face as a society.

"we are already capable of creating a world of tricorders, replicators, remarkable transportation technologies, general wellness and an abundance of food, water and

³⁴ Vivek Wadhwa, "Perspective: Self-driving cars should leave us all unsettled. Here's why," *The Washington Post*, April 24, 2017, accessed February 23, 2018, https://www.washingtonpost.com/news/innovations/wp/2017/04/24/self-driving-cars-should-leave-us-all-unsettled-heres-why/?utm_term=.f40c943daba3.

³⁵ Anita Balakrishnan, "Drivers could lose up to 25,000 jobs per month when self-driving cars hit, Goldman Sachs says."

³⁶ Matt McFarland, "Driverless Cars and Your Job -- CNN Tech."

energy. On the other hand, we are capable too now of ushering in a jobless economy; the end of all privacy; invasive medical-record keeping; eugenics; and an ever worsening spiral of economic inequality: conditions that could create an unstable.”³⁷

The fears associated with these advancements and their potentials to dramatically change the labor economy are proliferated by the source material for our educated decision making - the news - but in this case the news offers not answers, but more questions as a result of the abundance of contradictory and inconsistent data from trusted institutions. The idea of a jobless economy, an environment in which all jobs are taken over by artificially intelligent computers, strikes fear for most everyone, and for some, driverless trucks and other vehicles could be the impetus for this future. There are, however, opposing points of view with regard to our future employment economy. Some “experts say that the innovations of today will provide new opportunities for workers who are adaptable, and able to acquire new skills”.³⁸ But how those who lose out in the technological race to automation will achieve adaptability and the acquisition of new skills is yet to be seen. As with the industrial revolution and the movement of individuals from fields onto factory floors, there are sure to be new jobs that open up as a result of this new technology. But the questions that popular discourse pose are whether or not there will be enough jobs to make up for a potential mass displacement and if so, how will the displaced individuals retrain and attain the skills necessary for the new labor economy. While this vein of public discourse addresses the cultural significance of the automobile and far-reaching parts of our lives in which the car takes root, it does not include dialogue with regard to the social aspects of vehicles including the social communities of truck drivers that could dissipate along with their careers. These social groups are an important facet of society and illustrate just one aspect of the social life of vehicles that is not discussed by news outlets. Furthermore, it essentializes cars and

³⁷ Ibid.

³⁸ Matt McFarland, “Driverless Cars and Your Job -- CNN Tech.”

trucks to simply their technical function as transportation and their place in the economy, leaving out their symbolic and sociocultural embeddedness in our society and everyday lives.

Sustainability

Autonomous vehicle technology and sustainability issues in the media come in a few distinct flavors. The question of whether self-driving cars will ameliorate the environment or contribute its deterioration is a point of contention for popular news outlets. While some believe that self-driving cars will be highly sustainable, others hold that they could cost the climate and environment dearly. Of importance to this argument is the possibility that cars will be used far more than they ever have been and that private car ownership could sharply decline.

General Motors has “pledged itself to a future of zero emissions, zero crashes, and zero congestion.”³⁹ GM is not alone in their quest to develop a green car, with many companies (Tesla, Google, Ford, Chevy, among others) focusing their budgets and energies on electric or hybrid self-driving vehicles. Joel Kotkin, a writer for *Forbes* said, “we may well be on the verge of evolving a new kind of highly sustainable, near-zero carbon form, one linked by technology, and economically (and increasingly culturally) self-sufficient. Autonomous cars will remotely park in solar-charged sheds off-site, to be called to the home through handheld devices, thus eliminating the need for garages and driveways.”⁴⁰ This view of the future looks bright, with highly efficient cars zipping to and fro carrying passengers from place to place with little to no carbon footprint. This view is augmented by the idea that “roadways will be designed with much less paving to mitigate stormwater runoff and flooding.... With much less redundant paving and more undisturbed land, autonomous suburbs will expand parks, bike trails and farms and reduce

³⁹ Alex Davies, “Maven, the Car-Sharing Company That Could Save GM, Launches in Toronto,” *Wired*, February 13, 2018, accessed February 23, 2018, <https://www.wired.com/story/gm-maven-toronto/>.

⁴⁰ Joel Kotkin, “Autonomous Cars Are About To Transform The Suburbs.” *Forbes*, February 21, 2018, accessed February 22, 2018, <https://www.forbes.com/sites/joelkotkin/2018/02/21/autonomous-cars-are-about-to-transform-the-suburbs/#69a9459b7e62>.

forest fragmentation.”⁴¹ These projections illustrate some features of the highly sustainable future that we could be driven into by autonomous cars. With the changing dynamics of the built environment, the natural environment could be brought into cities, and as we all know, more trees is never a bad thing. Furthermore, Argonne National Laboratory in Illinois, “one of the Department of Energy-affiliated labs, has found that truck ‘platooning’ could improve fuel economy between 8 and 15 percent. Platooning, or driving in tight formation to reduce drag, may be possible with the improved safety features of automated vehicles. Other features on fully automated cars could reduce fuel consumption even more.”⁴² The increased sustainability of truck trips as a result of platooning illustrates yet another futuristic narrative of eco-friendly travel. Ideas of the future regarding sustainability and the eco-friendly and environmentally restorative potential for self-driving cars is echoed in other news stories apropos route optimization, a decline in traffic and the idling that is involved therein, and more fuel efficient acceleration and deceleration. However, these positive futuristic narratives represent only one side of the metaphorical coin as represented in the news and media.

Antithetical to the ideas and narratives described above, there is a stark side to the future that creeps through news articles. While there could be “no more slamming on breaks or gunning it at yellow lights.... Early research reveals a wide range of emissions possibilities for driverless cars. A 2016 report found that automated vehicles could reduce fuel consumption by as much as 90 percent, or *increase* it by 200 percent.”⁴³ This possibility illustrates the dark side of self-driving cars and their conceivable impact on our environment. What’s more, while truck platooning could decrease the amount of fuel consumed per trip, “we may make a lot more trips overall. With a car as a chauffeur... people who don’t currently use cars will be able to: like

⁴¹ Ibid.

⁴² Carolyn Beeler, “Driverless cars could either be ‘scary’ or great for the environment,” PRI’s The World, April 18, 2017, accessed February 23, 2018, https://www.pri.org/stories/2017-04-18/driverless-cars-could-either-be-scary-or-great-environment?utm_source=theweek&utm_medium=referral&utm_campaign=partnership.

⁴³ Ibid.

elderly people who can't drive anymore, and kids. Commutes might become longer as driverless cars change where we live.”⁴⁴ Along with the increased number of trips and the longer commutes, “without human error, the risk of car crashes is predicted to plummet. That’s the main selling point for automated vehicles, and it’s a great thing for safety, but it might also have a downside. With the risk of crashes greatly reduced, we may have our cars drive us faster and use a lot more gas.”⁴⁵ While this is assuming that the self-driving car is either a hybrid or gasoline engine model, it is still a very real downside in terms of sustainability. Moreover, “getting out of your car at the front of the movie theater without needing to park sounds good in theory, but if the car you’re driving isn’t electric, emissions would be worse than leaving your car idling while you watch the movie.”⁴⁶ This idea ties into the possibility that autonomous cars could circle the block while you are attending an appointment if parking is difficult to find. In both cases a vehicle is empty and driving around, expelling emissions and wreaking havoc on the environment. Both concepts link to the potential for increased use of the automobile, the perfect leeway into our next topic of discussion.

Increased use of cars and thus the potential damage to the environment by way of emissions encapsulates multiple issues that were brought up across news and media outlets. While autonomous vehicles could allow freedom and “provide door-to-door mobility not only for the elderly and disabled, but also for people who currently cannot afford their own cars”,⁴⁷ this could also potentially cause issues when it comes to congestion and road usage. Traffic plagues roadways both large and small and with all of those idling cars inching along, adding a larger population of vehicles to the roads could open the door to extreme congestion problems - or so news articles and transportation studies claim. Furthermore, personal vehicle ownership is

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Alicia Prince, “Unbelievable Benefits and Drawbacks Of The Self-Driving Car,” Lifehack, April 29, 2015, accessed February 23, 2018, <http://www.lifehack.org/articles/technology/unbelievable-benefits-and-drawbacks-the-self-driving-car.html>.

⁴⁷ Joel Kotkin, “Autonomous Cars Are About To Transform The Suburbs.”

projected to decline as a result of self-driving cars. The changing dynamics of car ownership and vehicle sharing could result in “a 75 percent increase in individual vehicle usage, from 11,661 to 20,406 annual miles per vehicle.”⁴⁸ That’s ignoring the empty ‘return-to-home’ “trips after a vehicle, for instance, leaves off a worker at the office and then drives itself back to the family home for use in mid-day errands. Before returning to the worker’s office for the end-of-day commute.”⁴⁹ Periods during which self-driving vehicles are traveling without at least one passenger are cited as primary examples of a lapse in sustainable efforts. There are multiple campaigns across the country that promote carpooling, but the idea that a car could eventually be driving empty seems ludicrous and undercuts these environmentally friendly endeavors. Especially if the vehicle is operating with a gasoline engine or a hybrid engine rather than a purely electric engine.

These empty car trips also add to the projection that “vehicle miles traveled may well increase”⁵⁰ as I mentioned previously. This could not only cause issues for congestion and more cars idling on roadways, but if a vehicle is able to drive itself then the car’s lifespan will be considerably shorter than they are now because reaching 100,000 or 200,000 miles will happen much more quickly if the vehicle is constantly driving with or without a passenger. Additionally, the car parts such as the tires and batteries that must be replaced at certain mileage markers could greatly increase, thus increasing the number of the worn parts that must be recycled or disposed of in some other way. These concerns are very real and while some remain hopeful that self-driving cars will use renewable energy and lessen the carbon footprint made by transportation, there are those who take a pessimistic look at the future of automobiles.

⁴⁸ James Anderson, et al, *Autonomous Vehicle Technology: A Guide for Policymakers*, Santa Monica, CA: RAND Corporation (2016), accessed February 23, 2018, https://www.rand.org/pubs/research_reports/RR443-2.html.

⁴⁹ Bud Ward, “Self-Driving cars: pros and cons, and unknowables,” Yale Climate Connections, April 4, 2016, accessed February 23, 2018, <https://www.yaleclimateconnections.org/2016/04/electric-cars-pros-cons-and-unknowables/>.

⁵⁰ Todd Litman, “Autonomous Vehicle Implementation Predictions: Implications for Transport Planning,” *Victoria Transport Policy Institute*, February 9, 2018, 1-35, accessed February 23, 2018, <http://www.vtpi.org/avip.pdf>.

This skeptical view of the sustainable nature of self-driving cars is only reinforced by articles reporting that a top Ford executive asserted that “hybrids make better self-driving cars than [the] electric cars some automakers are using.”⁵¹ This news was accompanied by the statement that, “Hybrid cars will be able to stay on the road for longer periods of time than electrics - Ford plans to have its cars on the road for 20 hours a day, said Jim Farley, Ford’s executive vice president and president of global markets”.⁵² The ability for a car to be on the roadways for 20 hours straight bolsters the fears mentioned previously and also introduces the idea that a car could be driving around relying on an engine that switches from electric to gasoline for 20 hours straight on a day-to-day basis, a massive amount of time that is unheard of in the context of private vehicles or even shared vehicles as they exist currently. The above topics are echoed throughout news articles as the media attempts to predict the ramifications, both good and bad, of self-driving vehicles in an effort to paint a picture of what kind of future we are entering. The public discourse apropos autonomous vehicles and sustainability illustrates the degree to which the car is affixed in our culture and in everyday life. However, the media reduces the automobile to simply its use as transportation, neglecting the important social and cultural meanings of the car.

Exurbs, the Commute, Congestion, and Infrastructure

When looking to the future of city, suburb, and exurb planning in the self-driving car moment, there are four major themes that came up across news and media outlets. These include real estate, the commute, congestion, and infrastructure. These larger themes unfold to reveal both positive and negative perspectives on how autonomous vehicle technology could alter our daily lives in terms of where we live, how we travel, and the built environment. While these are

⁵¹ Robert, Ferris, “Ford says hybrid beat electric for self-driving cars,” CNBC, December 1, 2017, accessed February 25, 2018, <https://www.cnbc.com/2017/12/11/ford-says-hybrids-beat-electric-for-self-driving-cars.html>.

⁵² Ibid.

human issues, an important issue that is not discussed in reference to the changing landscape, both literal and figurative, are the social ramifications of extending suburbs to exurbs and the multitude of implications of this possibility as well as how this expansion could affect the cultural meaning of the vehicle.

With the potential rise of self-driving cars, motifs of real estate and the likelihood of even more urban sprawl than already exists came up most frequently across news outlets. Kotkin, with *Forbes* wrote, “by one estimate, as much as a trillion dollars of real estate value could swing to locations far from job centers that will become more attractive due to autonomous vehicles while reducing the ‘premium’ now awarded to closer in neighborhoods and inner-ring suburbs.”⁵³ This projection could result in a massively changing real estate landscape. In fact, “Ralph McLaughlin, the chief economist at Trulia, the real estate website, expects residents to gravitate toward nature and pristine regions, which are within an hour or two of their offices.”⁵⁴ This projection represents a potentially devastating effect on the natural environment as people opt to build houses and communities far from city centers in areas that are currently wilderness, enabled to do so by autonomous vehicles. Not only could this result in destruction of wilderness areas in favor of housing developments, but McLaughlin also says that, “this would be a blow to some cities’ tax bases, making it difficult to provide services for remaining residents.”⁵⁵ Both of these potential outcomes do not stand alone, rather, their detrimental ripple effect could manifest itself in the exacerbation of inequality triggered by runaway sprawl.⁵⁶

In fact, many experts worry that “the wealthy are best positioned to enjoy the gains of the new technology. For example, low-income service sector workers won’t be able to move to big, affordable homes in the exurbs. Their work requires being on-site for an entire shift, which

⁵³ Joel Kotkin, “Autonomous Cars Are About To Transform The Suburbs.”

⁵⁴ Matt McFarland, “How Driverless Cars Will Change Cities,” CNN Money, accessed February 23, 2018. <http://money.cnn.com/technology/our-driverless-future/self-driving-cars-will-change-your-life/>.

⁵⁵ Ibid.

⁵⁶ Ibid.

makes a two or three hour commute in a car unrealistic.”⁵⁷ The inequality that could result from self-driving cars is not just limited to service sector workers, though. “Myron Orfield, director of the institute on Metropolitan Opportunity at University of Minnesota Law School, warns that autonomous vehicles will make segregation easier. A similar script played out when the United States built out its highway system, speeding suburban development and white flight.”⁵⁸ Both of these sentiments are talked about in numerous other news articles as people use history in an attempt to predict the future, and in this case, the future doesn’t seem like a step forward, but rather a step backward. The possibility of a shift in real estate as a result of autonomous vehicles represents only a single facet of predictions with regards to exurbs and suburban sprawl and though this potential change has a multiplicity of after-effects, I have found that the commute associated with the rise of exurbs is the most discussed concern.

The commute and the likely shifts that could take place with regard to a generally unpleasant time of day seems to be either the focus of, or at least a topic within, most news articles about self-driving cars. Some articles highlighted the possibility for “productive uses of long commuting times for those no longer needing to be behind the wheel”.⁵⁹ The idea that one could reclaim their commute time for leisure time or getting a head start on the day illustrates a positive potential outcome of self-driving cars. While a reclamation of that time could seem to be as good as it gets, “a recent report by the global consulting firm Bain & Co. predicts that technological advances such as the autonomous car will help to create a ‘post-urban economy’ that will be more localized and home-based. By 2025, its analysts write, fewer people could live in urban cores than in exurbs, which it defines as ‘beyond the traditional commuting belt.’”⁶⁰ If you thought the possibility of a relaxing commute was great, how about no commute at all? The

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Bud Ward, “Self-Driving cars: pros and cons, and unknowables.”

⁶⁰ Joel Kotkin, “Autonomous Cars Are About To Transform The Suburbs.”

popularization of working from your exurban home as a result of driverless cars exemplifies yet another positive outcome of the new type of commute, or lack thereof, that autonomous vehicles could bring. While these types of projections offer positive outlooks on the future of transportation they forget the social interactions that take place in the office. The enforced sociability of office work and meal times are important for both personal wellbeing and team building but analyses in the news and media neglect to discuss both issues.

Road capacity and congestion plague cities worldwide. When the traffic gets bad enough roadways are widened, and, paradoxically, rather than ameliorating the problem and freeing up gridlock, people often take the addition as an invitation to drive to work rather than take public transportation. In this way, while adding yet another lane to the already monstrous freeways might alleviate traffic for some time, those new spaces are quickly filled up by new commuters who decide to take advantage of the extension. Carpool lanes, too, offer some solace from the single-passenger traffic, but what happens when more cars are hitting the road and zipping around completely empty? What happens when cars are continually driving around rather than being parked for the day and then used again to return home from work? The answer to both of these questions was discussed in a startling number of articles: traffic. Whether that sentiment is expressed in words such as, “experts warn that autonomous vehicles may worsen congestion”⁶¹ or Paul Priestman, a leading transport designer’s assertion that self-driving cars will “exacerbate congestion rather than improve it,”⁶² it all boils down to the prediction of more cars on the road for longer periods of time, some of which might not even have passengers in them.

Meanwhile, there are other views of autonomous vehicles and their effect on traffic. One article claims that, “because self-driving cars are rarely involved in accidents, their potential to

⁶¹ Matt McFarland, “How Driverless Cars Will Change Cities.”

⁶² Marcus Faris, “Self-driving cars will exacerbate congestion, says Paul Priestman,” Dezeen, January 10, 2018, accessed February 25, 2018, <https://www.dezeen.com/2018/01/10/self-driving-cars-exacerbate-congestion-says-paul-priestman/>.

ease congestion is high. Not only that, but because self-driving cars can communicate with each other, they would eliminate the need for traffic signals. By driving at a slower rate with less stops, better coordinated traffic would lead to less congestion.”⁶³ This prediction touches on the frequency with which accidents are the cause of traffic, a topic that is not brought up in the context of the opposite point of view. Similarly, the ability for vehicles to flow more smoothly due to their ability to communicate was missed in arguments surrounding increased congestion. However, the assertion of less traffic associated with self-driving cars does not rebut the possibility that autonomous vehicles could make traffic worse. This was a trend throughout news articles on the subject, most neglecting to bring up the opposing point of view while also leaving out certain effects that self-driving cars will have on our transportation culture. In all, the topic of congestion was noted in most every article whether the author took the positive or negative stance on the issue. The ubiquity of this topic is most likely due to the familiarity that most people have with the annoyance of being stuck in a traffic jam and thus a mutual interest in issues related to congestion.

While not considered nearly as frequently as congestion, infrastructure as a result of autonomous vehicles came up relatively often in future-focused news articles. Topics included changes in “urban parking infrastructures”⁶⁴ and the ability to reclaim that space for other uses. This projection results from the possibility that self-driving cars will not be parked, but rather that they will be perpetually driving and taking passengers to various destinations only to depart and pick up another customer. In the case that street parking was reclaimed, pedestrians could revel in more sidewalk space. Jean Jacobs, in her book *The Death and Life of Great American Cities*, writes about the social and cultural importance of sidewalks as a place where people interact and converse. In the book she laments auto culture’s stripping away of street life and

⁶³ Alicia Prince, “Unbelievable Benefits and Drawbacks Of The Self-Driving Car.”

⁶⁴ Bud Ward, “Self-Driving cars: pros and cons, and unknowables.”

claims that “the conflicts between pedestrians and vehicles on city streets arise mainly from overwhelming numbers of vehicles, to which all but the most minimum pedestrian needs are gradually and steadily sacrificed.”⁶⁵ The effects that self-driving cars could have on the built environment are not limited to the repossession of space, they also extend to the expansion of suburbs and exurbs, as mentioned earlier. Linked to both the potential for parking space to become nearly obsolete and the issue of traffic congestion, an article from *Lifehack* claimed that,

“because self-driving cars don’t require a driver, they could alleviate parking concerns in highly populated areas. For example, a passenger could get out at their destination, and if no parking was available the car could circle the block until the passenger was ready to leave.”⁶⁶

This article is not alone in the projection of a new type of mobility in terms of what happens when you step out of the vehicle. Whether an individual is using a ridesharing service or their own personal car, what happens when they reach their destination could be very different from what occurs now. As mentioned in the section about sustainability, empty cars circling the block could aggravate our already precarious situation with global warming. In this way, the effects of driverless cars have far reaching, complex, and intertwined implications.

The ramifications of self-driving cars on exurbs and suburbs are not discrete. Rather, they are intertwined and effect each other in complex ways that will only become apparent as this technology becomes widely used. Autonomous vehicles have the potential to alter many aspects of our lives from where we live; how or if we commute; traffic or lack thereof; and urban, suburban, and exurban infrastructure. While there was no agreed upon prediction for what the future will bring, news outlets are exploring both the optimistic and pessimistic sides of autonomous vehicle technology. What is left out of this discourse, though, are the dynamic social implications of the aforementioned aspects of driverless cars. These facets, too, are important to

⁶⁵ Jean Jacobs, “Erosion of cities or attrition of automobiles,” in *The Death and Life of Great American Cities*, (New York: Vintage Books: A Division of Random House, 1961): 346.

⁶⁶ Alicia Prince, “Unbelievable Benefits and Drawbacks Of The Self-Driving Car.”

analyze and discuss in the context of transportation culture because without the social human factors we leave out a crucial aspect of what the car means and how the automobile enters into the social repertoire in American society. While this coverage reveals the degree to which the car is embedded in our lives, these projections speak only about the car in the context of its transportation capabilities, failing to consider the complex relationships that individuals have with their cars and the myriad of ways in which those relationships could be altered in the context of this innovation.

Safety

Safety is one of the most widely discussed topics when it comes to autonomous vehicle technology in popular discourse. While safety is an overarching theme of news articles on self-driving cars, the topic can actually be broken down into six categories: keeping humans safe, the liminal stage, accidents on autopilot, technological advances, educating consumers, and hacking. While there is no consensus about what the real ramifications of this technology will be on public safety, the resounding opinion is that self-driving cars will improve road safety in the most general sense.

The possibilities for ensuring that passengers get from point A to point B safely are seemingly endless as driverless technology advances. Some articles begin with highlighting the current state of auto collisions, citing that, “each year, about 35,000 people die in motor vehicle crashes on U.S. roads. In fact, more Americans have died in car crashes than in wars. But it’s not just a problem in the U.S. -- 1.25 million people die in motor vehicle crashes each year, worldwide.”⁶⁷ Meanwhile, others cite professionals in the industry such as Chris Valasek, who works for General Motors’ driverless car division, on the topic of safety he is of the opinion that

⁶⁷ Matt McFarland, “Driverless Car Safety,” CNN Money, accessed February 23, 2018, <http://money.cnn.com/technology/our-driverless-future/driver-death-rate-zero/>.

“the potential benefits of driverless cars outweigh the risks.”⁶⁸ Specifically, he says, “They can’t drive drunk, they can’t drive tired, and they don’t look at Twitter on their phone while they drive... millions of people are going to be exponentially safer with this type of technology.”⁶⁹ Both introductions into the discussion of driverless cars set up the technology as a champion of safety.

Interestingly, phrases like, “machines don’t get distracted, text and drive, or drink and drive”⁷⁰ are echoed across multiple articles, especially those that are focused on the safety associated with allowing a computer to drive you around. In general, articles focusing on the human safety factor that self-driving cars are predicted to improve agree that, “when it comes to driving, it seems, human beings just aren’t good enough.”⁷¹ Furthermore, while some assertions are broad, others pinpoint a specific safety feature such as the ability for “sensors [to] spot that a driver at the controls is becoming sleepy, or is drunk, [and] the system could [then] prompt the car to take over.”⁷² The advantage of a feature such as the aforementioned is most definitely a wonderful addition to the already growing repertoire of features such as lane keeping and collision avoidance.

While the potential safety perks of autonomous vehicles are far-reaching, the liminal space between early and widespread adoption is said to be a time of confusion and difficulty for both human and computer drivers. This transition time is mentioned in most articles as a closing commentary, for example one writer for the *Yale Climate Connections* asserted that, “a significant portion of motorists may not want AVs at all, just as some motorists prefer manual

⁶⁸ Theo Leggett, “Will we ever be able to trust self-driving cars?” BBC News, January 19, 2018, accessed February 24, 2018, <http://www.bbc.com/news/business-42710215>.

⁶⁹ Ibid.

⁷⁰ Matt McFarland, “Driverless Car Safety.”

⁷¹ Theo Leggett, “Will we ever be able to trust self-driving cars?” BBC News, January 19, 2018, accessed February 24, 2018, <http://www.bbc.com/news/business-42710215>.

⁷² Srikanth Saripalli, “Before Hitting the Road, Self-Driving Cars Should Have to Pass a Driving Test,” *Scientific American*, February 22, 2018, accessed February 23, 2018, <https://www.scientificamerican.com/article/before-hitting-the-road-self-driving-cars-should-have-to-pass-a-driving-test/>.

transmissions... leading to mixed traffic that creates new roadway management problems.”⁷³ The uncertainty of what will happen when computers meet humans on the roads is reinforced by current accidents involving autonomous vehicles as they fail to predict and respond accurately and quickly to human actions and decision making.

The skepticism and anxiety associated with sharing the road with robot cars is not the only type of fear associated with this liminal space, though. In fact, “research has shown that drivers get lulled into a false sense of security to the point where their minds and gazes start to wander away from the road. People become distracted or preoccupied with their smartphones. So when the car encounters a situation where the human needs to intervene, the driver can be slow to react.”⁷⁴ This illustrates the existence of a too much trust given to the computers that are driving the car. This confidence in the technology proves problematic because the drivers who are playing passenger for a time are supposed to be alert in case the system is unable to handle a situation and requires human intervention. This circumstance is often called “the handoff,” a moment characterized by the computer’s inability to cope with something happening on the roadway and the request for the driver to resume control. This is a difficult situation according to multiple sources because drivers who have their car doing the driving for them are often not paying attention and are then caught by surprise when the car requires that the driver take over and potentially make an evasive maneuver or navigate a complicated situation. The technical hitches that could occur in the interim could be further exacerbated because we are “at a time when there is already a surge in collisions by drivers distracted by their smartphones, [so] we could be entering a particularly dangerous period of growing pains with autonomous driving

⁷³ Bud Ward, “Self-Driving cars: pros and cons, and unknowables.”

⁷⁴ Olivia Solon, “Who’s driving? Autonomous cars may be entering the most dangerous phase,” *The Guardian*, January 24, 2018, accessed February 23, 2018, <https://www.theguardian.com/technology/2018/jan/24/self-driving-cars-dangerous-period-false-security>.

systems.”⁷⁵ These concerns are mentioned in most every article that tackles the safety potentials and drawbacks for self-driving cars probably because it is the most immediate future situation that we will encounter and therefore arguments with regard to the “messy interim period”⁷⁶ ground the article in the not-so-far-off future of autonomous vehicles.

Currently, this technology is being tested on roadways across the country and many level two vehicles are being sold to consumers. However, the technology has encountered a few problems along the way including accidents while cars are on some sort of self-driving mode. “It’s an issue that has been underscored by recent cases of drivers ending up in accidents while their level two car was apparently on autopilot.”⁷⁷ These issues are echoed across news platforms and are highlighted due to the new accountability that can be thrust unto a machine. Some articles go so far as to assert that “we could be trading human error - such as distracted driving - for machine errors. But the autonomous vehicle industry is so new that it’s nearly impossible to know how many lives could be lost to these errors.”⁷⁸ Similar sentiments are found sprinkled across numerous articles about driverless cars but they are often followed up with the sunny assertion that “concern over this new type of distracted driving is forcing automakers to introduce additional safety features to compensate. For example, GM has introduced eye-tracking technology to check the driver’s eyes are on the road. Additionally, Tesla drivers can be locked out of autopilot if they ignore warnings to keep their hands on the steering wheel.”⁷⁹ The introduction of this type of technology will hopefully keep humans honest when it comes to distracted driving, or, rather, distracted passengering. Unfortunately, though, these safety improvements do not precede incidents, rather in these amendments often follow serious or deadly accidents.

⁷⁵ Ibid.

⁷⁶ Olivia Solon, “Who’s driving? Autonomous cars may be entering the most dangerous phase.”

⁷⁷ Srikanth Saripalli, “Before Hitting the Road, Self-Driving Cars Should Have to Pass a Driving Test.”

⁷⁸ Matt McFarland, “Driverless Car Hacking,” CNN Money, accessed February 23, 2018, <http://money.cnn.com/technology/our-driverless-future/keep-hackers-out-of-your-driverless-car/>.

⁷⁹ Olivia Solon, “Who’s driving? Autonomous cars may be entering the most dangerous phase.”

Widely mentioned in informational articles about autonomous vehicle technology are the technological advances that are occurring daily in the race to develop a car that can drive itself. For example, it is said that, “during testing, companies track the statistical performance of self-driving cars on real roads and in computer simulations. With these simulations, engineers can create thousands of new challenges, and see how the vehicles perform. Waymo’s vehicles, for example, have completed more than 2.5 billion miles of simulated driving through [this method of] testing in the last year.”⁸⁰ This number is staggering and offers a sense of security when it comes to self-driving cars and the future of transportation. Furthermore, other articles mention the specific types of technological achievements that are contained within driverless vehicles. For example, one article states,

“The incredibly complicated technology behind self-driving cars lets the on-board computer make hundreds of calculations a second. These include how far you are from objects, current speed, behavior of other cars, and location on the globe. These super accurate readings have virtually eliminated driving error for test cars on the road, as the only accidents so far are while human drivers have been in control.”⁸¹

While there are more positive leaning articles that mention statistics and numbers with regard to safety features and extensive testing, there are also those that prefer to remain more conservative. These articles echo sentiments such as, “although self-driving cars promise to eliminate human error and could cut down on crashes, the technology is far from perfect.”⁸² Both methods of asserting the technological advances that have been made, and those that have yet to be accomplished, illustrate the general trends present in articles about self-driving vehicles and their potentials on roadways across the country.

The issue of educating consumers about self-driving cars and their limitations came up somewhat regularly across media coverage. These concerns spanned from expressing worry with regard to how people can be confident in technological mechanisms that they know nothing

⁸⁰ Matt McFarland, “Driverless Car Safety.”

⁸¹ Alicia Prince, “Unbelievable Benefits and Drawbacks Of The Self-Driving Car.”

⁸² Matt McFarland, “Driverless Car Hacking.”

about, to knowing how the vehicle will respond to various stimuli. For example, one article said, “when self-driving cars do hit the road, they crash in ways both serious and minor. Yet all their decisions are made electronically, so how can people be confident they’re driving safely?”⁸³ This preoccupation with regard to whether or not humans will be able to fully trust computers to drive a car as they would trust themselves to do so was reiterated in various ways in news coverage. Additionally, the lack of public knowledge about how these vehicles will respond to stimuli on the roads is a major concern, “before autonomous cars are on the road, everyone should know how they’ll respond in unexpected situations.”⁸⁴ This type of worry was often expressed by different scenarios, for example there is the notorious mention of the trolley problem in the context of self-driving cars and the question of whether they will save one life over another.

Only one article, however, answered the question, “it’s not that the problem is impossible to come up, it’s not, but an error has been made if that were ever to occur. If you’re ever in a situation in which you’re faced with the trolley problem, the car has made a much more serious error. It should have been more conservative so that it was never faced with that situation.”⁸⁵ Aside from knowing what the car will do in specific scenarios, what’s arguably more important is ensuring that individuals know exactly what the technology is capable of so that they do not expect too much from something that is not as advanced as they believe it to be. “While there’s no doubt that fully autonomous self-driving cars are on their way, there are concerns that many of us may confuse assisted driving technologies - cruise control, lane keeping, automatic braking, collision avoidance systems and so on - with full autonomy. And this could make us dangerously complacent”.⁸⁶ The fear of complacency and the risks associated with individuals overestimating the capabilities of their vehicle and the inevitability that an individual who is riding in a car that

⁸³ Srikanth Saripalli, “Before Hitting the Road, Self-Driving Cars Should Have to Pass a Driving Test.”

⁸⁴ Ibid.

⁸⁵ Matt McFarland, “Driverless Car Safety.”

⁸⁶ Theo Leggett, “Will we ever be able to trust self-driving cars?” BBC News, January 19, 2018, accessed February 24, 2018, <http://www.bbc.com/news/business-42710215>.

is driving itself will become distracted in some way or another and be unable to take control of the vehicle in order to evade crashing is very concerning. Furthermore, the necessity for drivers to be educated on “what they’re dealing with - and that a clear distinction is drawn between “hands-on” and “hands-off” set-ups”⁸⁷ is frequently mentioned in various ways across the media. These issues are important to address given that with the introduction of a new technology people are often eager to test the boundaries, especially if the testing of the boundaries involves the ability to browse social media, fall asleep, or engage in some other form of distracted behavior.

Hacking is a major issue facing self-driving cars and fears associated with the potential for a hacker to take control of an individual’s vehicle is expressed at least in passing in most articles that cover autonomous vehicles more generally. On the topic of hacking, one news article said, “handing increased amounts of control to computers comes with other risks, too, not least of which is the danger of being targeted by hackers. Increasingly, modern cars come with internet connections, to help operate entertainment and navigation systems, or to allow them to be unlocked and started remotely using a phone. That makes them vulnerable.”⁸⁸ This vulnerability is communicated in multiple ways, one of the most prevalent is in some sort of scenario. For example, one article wove just such a narrative.

“One day in the future, you might be riding in a self-driving car and find yourself in this scenario: you approach a set of train tracks when the vehicle stops and the engine turns off. The electric windows disable and the doors lock. A message from hackers appears on the dashboard: there’s a train approaching; you better pay us a ransom.”⁸⁹

In the case of this article, the narrative above is used to illustrate a fear that is not unique to the writer. In fact, the article’s author goes on to explain that the MCity, the University of Michigan’s autonomous vehicle center is researching this exact type of situation and how to

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Matt McFarland, “Driverless Car Hacking.”

protect vehicles from falling prey to hackers. In another instance, an article brings up the potential for a malfunctioning update to mess with the car's software. "Though successful programming lets us do incredible things, there is always the potential for some unexpected glitch to emerge. Even if a self-driving car performs flawlessly at first, it is possible for the programming that runs the car to be updated by the car company with a faulty string of code. Errors like this cause annoyance on our computers and mobile devices, but could potentially cause car accidents with self-driving cars."⁹⁰ The idea for over-the-air software updates for self-driving cars is not new, but as this article points out, the faulty update is a situation that we are all too familiar with in the context of our computers and smartphones, problematizing the application of updates to driverless vehicles.

While some articles might attempt to put readers at ease, many of those that I reviewed had no such agenda. In fact, they were blatant in their criticism citing evidence like, "researchers warn that it's impossible to track how many threats each self-driving application and component faces. When it comes to hacking, playing defense is tougher than being on offence. One mistake could compromise an entire system."⁹¹ Others cite specific researchers, one saying that "Kathleen Fisher, computer security professor at Tufts University, Massachusetts, and a former programmer manager at the U.S. defense research agency Darpa... believes companies simply don't have enough economic incentives to make their products hacker-proof."⁹² On this topic Fisher says, "Even if one car company was really motivated to make their cars as secure as technology knows how to, the problem is that costs money."⁹³ The mentions of hacking and the dangers associated with putting your life into the hands of a computer system that can be hacked, opens up an entirely different facet of safety, a facet that is widely covered in popular culture.

⁹⁰ Alicia Prince, "Unbelievable Benefits and Drawbacks Of The Self-Driving Car."

⁹¹ Matt McFarland, "Driverless Car Hacking"

⁹² Theo Leggett, "Will we ever be able to trust self-driving cars?" BBC News, January 19, 2018, accessed February 24, 2018, <http://www.bbc.com/news/business-42710215>.

⁹³ Ibid.

Safety in the context of self-driving cars is a complex issue that is regularly brought up in most every article about autonomous vehicles. In the scope of my research I found six primary types of safety that were brought up with varying frequency. Whether an article covers keeping humans safe, the interim, accidents on autopilot, technological advances, educating consumers, or hacking, it is sure that an article about self-driving cars will bring up some tangential, but nonetheless important, factor of safety. Self-driving cars will inevitably bring about new and interesting aspects of safety as the technology develops and we begin to put our lives in the hands of computers. The topic of safety, as referenced in media coverage focuses primarily on the technical functioning of the automobile, essentializing it to its transportation ability. While this conversation illustrates the many ways in which the car is embedded in our lives, it neglects to touch on the complex and nuanced social meanings of the car and the unique personal relationships that individuals have with their cars. Ultimately, this layer would augment the macro-level conversation in popular discourse and would allow for a more involved analysis of how autonomous vehicles stand to change automobile safety.

Laws and Legal Issues

The laws that have been and will have to be changed in the face of legal issues that involve self-driving vehicles are a large part of the public discourse. These issues span topics from regulations, to bills, to safety guidelines, to determining culpability after an accident involving an autonomously driving vehicle. As the technology develops other points are sure to arise, but at this current moment as we look to the future of self-driving car technology these four topics have gripped the media. These subjects lead to the ultimate conclusion that with the pace of the technological development it is unlikely that the governing bodies will be able to reach, let alone lead the way into a future that is legally sound in the realm of self-driving cars. This lag,

alone, could result in safety issues and complex lawsuits as the powers that be attempt to grapple with the way in which robot cars are embedded in the legal system. Interestingly, though, these legal issues reduce the vehicle to simply its utilitarian function, forgetting to consider the complex relationships that individuals have with their cars and how new laws could fundamentally change the vehicle as a culturally saturated artifact.

Regulations for self-driving cars began in the federal government when “the Obama administration came up with 116 pages of regulations with lots of details, but little understanding of how self-driving cars worked.... These regulations... called for ethical decisions to be made ‘consciously and intentionally’ -- which is questionable, if not impossible, for a machine. The Trump administration pared down the rules to 26 pages, but have not yet addressed the important issue of testing self-driving cars.”⁹⁴ This drastic reduction in regulations has done little to allow lawmakers to “keep up with the pace of self-driving technology. They are wary of burdening automakers and tech companies with regulations that would slow innovation, but they need to ensure that the vehicles are safely deployed.”⁹⁵ The regulations will, however, continue to come as the government and automakers navigate these uncharted waters together. Debates about the amount of federal oversight that should be used for self-driving cars is a contentious subject across the media. While there is definitely a need for some federal regulations the extent to which these will reach is yet to be seen, especially due to the newness of the technology in question.

While regulations are important when it comes to ensuring the establishment of a framework for auto manufacturers and tech companies to adhere to as they develop self-driving technology, bills are also being written and passed through the U.S. House of Representatives

⁹⁴ Srikanth Saripalli, “Before Hitting the Road, Self-Driving Cars Should Have to Pass a Driving Test.”

⁹⁵ Associated Press, “Trump administration updates self-driving car guidelines,” Fox News, September 12, 2017, accessed February 24, 2018, <http://www.foxnews.com/auto/2017/09/12/trump-administration-updates-self-driving-car-guidelines.html>.

and the Senate. “The Self Drive Act, which passed unanimously in the House of Representatives in September, prevents each state from developing its own set of rules governing autonomous vehicles under 10,000 pounds. This simplified regulatory structure should accelerate how quickly autonomous cars arrive, but not trucks.”⁹⁶ The passing of The Self Drive Act in the House illustrates progress in government as the technology continues to develop at an amazing speed. Additionally, the Self Drive Act gave “the federal government the authority to exempt automakers from safety standards that don’t apply to the technology. If a company can prove it can make a safe vehicle with no steering wheel, for example, the federal government could approve that.”⁹⁷ The bill also “permits the deployment of up to 25,000 vehicles in its first year and 100,000 annually after that.”⁹⁸ The Act was received by the Senate on September, 7, 2017, read twice, and referred to the committee on Commerce, Science, and Transportation.⁹⁹ The Self Drive Act is just the beginning in terms of bills that will go through the House and the Senate as the development of self-driving technology charges ahead. As with any suggested bills, the Self Drive Act was, and still is, addressed across public discourse and by many media outlets.

Safety guidelines put forth by the federal government is also a widely discussed topic in the media. “Under Obama, automakers were asked to follow a 15-point safety assessment before putting test vehicles on the road. The new guidelines reduce that to a 12-point voluntary assessment, and no longer require automakers to consider ethical or privacy issues. The guidelines also make clear that the federal government - not states - determine whether autonomous vehicles are safe.”¹⁰⁰ The voluntary nature of the assessment is a point of disagreement among liberal and conservative bodies, and regularly appears in in public discourse

⁹⁶ Matt McFarland, “Driverless Cars and Your Job -- CNN Tech.”

⁹⁷ Associated Press, “Trump administration updates self-driving car guidelines.”

⁹⁸ Ibid.

⁹⁹ U.S. Congress. House. Commerce, Science, and Transportation. *All Information (Except Text) for H.R.3388 - SELF DRIVE Act*. By Robert E. Latta. 115th Cong., 1st sess. H. H.R.3388. Washington D.C.: Congress.Gov, 2017.

¹⁰⁰ Associated Press, “Trump administration updates self-driving car guidelines.”

and news articles. While some hold that the “voluntary nature of the guidelines gives the government no authority to prevent dangerous experimental vehicles,”¹⁰¹ others retort that, “the new guidelines encourage companies to have processes in place for broad safety goals”¹⁰² as well as “to clear barriers for automakers and tech companies who want to get test vehicles on the road.”¹⁰³ These safety guidelines came into play when “the National Transportation Safety Board was debating whether Tesla Inc.’s partially self-driving Autopilot system shared the blame for the 2016 death of a driver in Florida.”¹⁰⁴ The safeguards put in place to offer a framework for companies developing the technology are brought up regularly in public and news discourse. Conversations about safety guidelines in the context of autonomous vehicles become especially pointed when courts are called upon to determine culpability in the event of a crash.

The issue of culpability when a self-driving vehicle crashes or malfunctions is a point of controversy. One of the first situations that has arisen in this vein is a lawsuit involving an autonomous vehicle that General Motors is facing. This lawsuit was filed “after a collision between [GM’s] Cruise self-driving car and a motorbike in California.”¹⁰⁵ This incident, though currently novel, “highlights the dilemma of autonomous vehicles: who pays in the case of an accident?... Should the driver, who may or may not be in direct control of the vehicle at the time, have responsibility for all operations of the vehicle?”¹⁰⁶ The natural extension of both of these questions is how auto insurance companies will cope with collision liability and what kind of coverage might need to be developed to cover incidences such as this one, especially in the interim before widespread adoption. Another example of an incident involving a self-driving vehicle took place in California when “police officers approached a Tesla stopped in the center

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ Samuel Gibbs, “GM sued by motorcyclist in first lawsuit to involve autonomous vehicle,” *The Guardian*, January 24, 2018, accessed February 23, 2018, <https://www.theguardian.com/technology/2018/jan/24/general-motors-sued-motorcyclist-first-lawsuit-involve-autonomous-vehicle>.

¹⁰⁶ Ibid.

of a five-lane highway outside San Francisco last week”¹⁰⁷ inside of which “they found a man asleep at the wheel. The driver, who was arrested on suspicion of drunk driving, told them his car was in ‘autopilot,’ Tesla’s semi-autonomous driver assist system.”¹⁰⁸ This incident illustrates a matter discussed previously, the issue of educating consumers on the capabilities of the technology in an effort to ensure that people do not put too much faith in a system that is not yet equipped to be fully autonomous. Another incident involved “firefighters in Culver City [who] reported that a Tesla rear-ended their parked fire truck as it attended an accident on the freeway. Again, the driver said the vehicle was in autopilot.”¹⁰⁹ These systems are clearly less than perfect, however, when individuals put too much faith in the computer’s ability to operate the vehicle with little to no human interaction, mistakes such as the ones described can occur and it is the job of laws and courts to determine who is at fault. There is no doubt that these types of occurrences will continue as the technology develops, but it is an extensively discussed issue that will ultimately have to be solved.

Legal issues and laws are consistently popular topics of debate among news outlets and conversations about such matters are regularly taken up in public discourse. Through my research, I found four main topics that came up frequently in articles from various sources, these subjects included regulations, bills, safety guidelines, and the problem of determining culpability after an accident that involves a vehicle that is driving itself. The coverage of legal issues regarding driverless cars does not, however, note the complex ways in which laws could alter the complex relationships that individuals have with their vehicles as more than mobile commodities. Though it is necessary to establish laws that deal with the car as a legal entity, the social ramifications of these changes are similarly crucial as they are the effects that most immediately have an effect on everyday life.

¹⁰⁷ Olivia Solon, “Who’s driving? Autonomous cars may be entering the most dangerous phase.”

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

Cost

There are a number of concerns that arise in public discourse with regard to the cost of self-driving cars. In this context, I am referencing the monetary cost. This topic primarily came up in a two ways, the cost of shared transportation and the cost of a private car. While the conversations around these facets of the cost of self-driving cars is dominated by projections, they are important nevertheless due to their ubiquity in public discourse and news media. This facet of the macro-level discourse illustrates yet another aspect of our lives in which the automobile is affixed. Though it deals with the automobile only as a commodity rather than an object that is saturated in social and cultural importance and meaning.

Some sources predict that self-driving cars are likely to first emerge in the ridesharing sector. In this case they “are expected to significantly decrease transportation cost”¹¹⁰ as a result of the lack of a human laborer along with other factors. One article claimed that “pre-mile rates with shared vehicles such as taxis may cost one-third to two-thirds less than for human-driven taxis, but expenses such as cleaning costs need also to be considered.”¹¹¹ These lower costs could greatly increase the population of individuals who have access to mobility. However, it could also damage the public transportation sector due to the highly competitive price tag. These low costs for transportation could also lead to a ripple effect with a movement from urban centers and suburbs to exurbs as discussed previously. The idea of lowered transportation expenditure could prove to be both liberating and disastrous. Liberating because it could open up opportunities that were previously closed due to cost. Disastrous because it could drive public transportation and other types of establishments out of business.

¹¹⁰ Matt McFarland, “How Driverless Cars Will Change Cities.”

¹¹¹ Bud Ward, “Self-Driving cars: pros and cons, and unknowables.”

The cost of a private car is also a widely discussed topic in the public discourse with regard to self-driving cars. For example, one *Business Insider* article predicts that,

“Up front, the cost is expected to be around \$3,000 per car that the technology is applied to. But what about repair costs?... And what are insurance prices going to do? In the event of a crash, who is responsible? We can’t imagine the insurance premiums going down for a car that isn’t 100 percent controlled by a human behind the wheel.”¹¹²

This excerpt illustrates the questions that come up repeatedly in news articles and public discourse vis-à-vis the cost of a personal autonomous vehicle. Another article quotes the Victoria Institute report and estimates that in the early stages of driverless cars, as with so many other technology deployments, “will initially be costly and imperfect”.¹¹³ Furthermore, the report predicts that in the 2020s and maybe even the 2030s, self-driving cars “are likely to be expensive novelties with limited abilities.”¹¹⁴ The article also claims that later, in the 2040s and 2050s, it is probable that “middle-income families can afford to own self-driving vehicles”,¹¹⁵ meanwhile, lower-income households could largely rely on the used-vehicle market.¹¹⁶ However, the issue with private car ownership is that unlike mobile phones or computers, vehicles are expensive and last far longer, thus, “consumers seldom purchase new vehicles just to obtain new technology.”¹¹⁷ These sentiments illustrate the fears that this technology could widen the privilege gap due to the cost of the technology embedded in the vehicles.

If it is true that ridesharing will see the first mass deployment of autonomous vehicles, then it is possible that the low costs could push private car ownership to the metaphorical back burner in favor of a cheaper method of mobility. Overall, the projected monetary cost of autonomous vehicles could result in the abandonment of the technology itself due to the harmful

¹¹² Travis Okulski, "Sorry, Google-But The Self-Driving Car Is An Awful Idea," *Business Insider*, June 15, 2012, accessed April 19, 2018, <http://www.businessinsider.com/the-self-driving-car-is-an-awful-idea-2012-6>.

¹¹³ Bud Ward, “Self-Driving cars: pros and cons, and unknowables.”

¹¹⁴ *Ibid.*

¹¹⁵ Bud Ward, “Self-Driving cars: pros and cons, and unknowables.”

¹¹⁶ *Ibid.*

¹¹⁷ *Ibid.*

side effects of substituting driverless alternatives for public transportation in combination with the sheer expense of purchasing a personal self-driving vehicle to replace a vehicle without such technology. The discourse centered around the cost ultimately focuses on the automobile as a commodity to be bought and sold and does not bring up analysis of social issues that the projected high price tag could stir up.

Conclusion

We are poised at the brink of what could be a revolution in transportation and the way in which we maneuver through our environment both built and natural. Though “many benefits offered by AVs won’t be realized until most or all vehicles on a road operate autonomously”,¹¹⁸ the study of popular discourse in the current historical moment with regard to autonomous vehicles offers unique insights into the way in which the automobile is viewed by the media. While “the sunniest optimists suggest that by 2030 the conversion to autonomous vehicles will be nearly complete. Other researchers predict the roll out of autonomous cars is going to proceed at a modest pace, with total sales in 2035 equaling only one-quarter of the present world population.”¹¹⁹ With a murky timeline and new technological advances being made every day, public discourse as represented in news articles illustrates the excitement and preoccupations that are sprinkled throughout most every conversation and discussion of the future of transportation. Topics that came up numerous times throughout my research included jobs and the potential for massive job losses and the establishment of new job sectors, the possibility for sustainable use of alternative energies or continued environmental destruction, the growth of suburbs and exurbs and the effects therein, the transformation of safety and transportation, the laws and legal issues that could come up as we grapple with accidents involving self-driving vehicles and a new

¹¹⁸ Ibid.

¹¹⁹ Joel Kotkin, “Autonomous Cars Are About To Transform The Suburbs.”

definition of culpability, and finally, the price tags of autonomous vehicles and the associated issues that result from high or low transportation costs. While taking the temperature of current public discourse reveals a web of subjects and points of contention as well as the many corners of our lives in which the automobile resides, it also uncovers the narrow and essentialized view of the automobile that the media assumes.

The media reduces the automobile to simply a functioning object when the automobile is so much more than its technical purpose. The vacant space that is left as a result of reducing the car to only its role as a mode of transportation is filled by the individual and social relationships that are intertwined with the car. While the news does address many facets of driverless cars and their antithetical consequences, it is also necessary to examine the nuanced relationships that people have with their vehicles and how those narratives embed the car into everyday life. After all, the car is not simply a tool and commodity, rather it is an artifact in our culture that is saturated with social meanings. The development of autonomous vehicles allows an ephemeral window through which we are able to estrange the car despite its seemingly intrinsic presence in our lives to see the complex and unique relationships that individuals have with the automobile.

2 The Unique and Constructed Human Relationship with Cars

Introduction

Cars, in their ubiquity, have embedded themselves into not only the public discourse but have also deeply ingrained themselves as a part of our lives. Many people in the United States have a seemingly inescapable dependence on their automobile, choosing to take on traffic jams during rush hour despite the comparable speed with which public transportation could deliver them to their destination. The seeming freedom that the automobile offers the driver is far more enchanting despite its false promises of speed and autonomy. It is this relationship with vehicles, the nuanced narratives that people have when it comes to their cars, and the way in which the car exists in everyday life that I will examine in this chapter. Specifically, I will unpack the sense of control and psychological reactions that individuals have when it comes to their cars and the connection that people have with their automobiles.

This line of inquiry is important because it illustrates the attachment that individuals have with their cars. This attachment refutes the notion that the car is simply a disposable commodity, a notion that is reinforced in the public discourse. The proof that the automobile is not simply a commodity used for its transportation value is evident in the complex and nuanced relationship that people have with their cars. We cannot consider the car as simply a tool or a commodity because that leaves out the intricate social relationships that individuals have with their vehicles. Autonomous vehicle technology, however, stands to change the relationships that individuals have with their cars. From these various notions about the future of vehicular technology, emerge

apprehension about the ways in which this technology could change personal relationships with cars.

Freedom

In the United States the automobile represents far more than its transportation ability. Ideals such as individualism and private property are deeply embedded in the automobile and in many ways the car has become synonymous with freedom. The notions of liberty and self-determination associated with the automobile prompted the growth of the massive interstate and road systems that blanket the country. The car enabled the cultivation of this massive web and it is because of this network that the car has affixed itself in our collective transportation repertoire. For, the more roads that are paved, the more necessary the automobile becomes. In other words, first came freedom, then came necessity. In this section I will address the issue of the freedom of the road and the ways in which the car has come to symbolize a national identity. I will also unpack the various ways in which the car has seemingly become a necessity as a result of its inextricable union with what it is to be American. The automobile as a symbol of freedom illustrates the attachment that individuals have with their cars and refutes the idea of the automobile as simply a commodity. Furthermore, fears are revealed regarding how driverless cars could transform the automobile as a cultural artifact that is deeply rooted in a national identity.

In many ways the construction of the car as a symbol of independence begins with advertising. The ideologies of independence and self-determination that automobile advertisements promote are the seeds from which this inextricable combination of car and freedom grow. Leah, a female college student from Washington who is studying business and marketing, commented on this manufacturing of American ideals of autonomy.

“I think that mostly cars offer a sense of autonomy and freedom that is really prized in American culture. I mean it makes me think of a sense of adventure as a lone ranger, sort of, I mean you have all of these cars like the Ford Ranger or the Chevrolet Trailblazer these are names that promote a kind of American idealization of the individual, free, explorer and I think that’s a huge part of cars.”

The thoughts that Leah brings up in the context of the narration of American autonomy and freedom as expressed by the automotive industry, most obviously in their naming of vehicles, is significant because they highlight that ideas of liberty. These notions are not simply manifestations, but that they are ideologies that are developed for the public, disseminated through advertisements, and consumed en masse. One main question that arises in the context of this liberty of mobility and the notion of the “lone ranger” or “frontiersman” that is intertwined with the car is what will become of it and how will it change with autonomous vehicles as they enter the ridesharing economy. This question is the source of anxiety because it demonstrates the beginning of what could be a large shift in our relationships with the car and their socially constructed meaning in society.

In this view of the future, ridesharing could become far more popular than it is today. In fact, people might even forego purchasing a car in favor of being able to hail a vehicle that is shared by all those who subscribe to the service. In many ways the current sentiment revolves around the hope that

“the car will help us live out our values, many of which we share and can identify as particularly American, distinctive and adapted to the national ways of life. These include the idea of freedom; a vision of the ideal man, woman, and family an abiding faith in progress; and the belief that individuality is superior to collectivism and conformity”.¹²⁰

The American love of cars is tightly intertwined with the “very American Dream of opportunity and success itself”.¹²¹ Each of the above values, provide “a pillar of the temple of car

¹²⁰ Catherine Lutz and Anne Lutz Fernandez, *Carjacked: The culture of the automobile and its effect on our lives*, 48.

¹²¹ *Ibid.*

mythology’¹²² The desire to live out the American Dream with the car as simultaneously the conduit and the object of that dream illustrates our attachment to automobile as well as our imagination of it.

The significance of the American Dream and our automobile culture is most clearly evidenced in the names of cars, the Ford Ranger, Escape, Mustang, and Explorer; the Chevrolet Traverse, Tracker, and Trail Blazer; the Dodge Charger, Challenger, and Journey; among many others. All of these names reflect an archetypal American spirit, insinuating that to capture this spirit, to be able to fully identify as American and live out the American Dream, one must own a car and from there, adventure and the freedom of the open road awaits. Similar communications are illustrated in car advertisements in which cars are driven on lonely roads through a pseudo-frontier, winding their way through forested areas, in a wilderness solitude that is within arm’s reach. That is just one among so many imaginative constructions of what it is to be American. All of these campaigns exemplify the promotion of the consumption of an identity that is uniquely American through the purchase of an automobile, the ultimate symbol of American freedom. This identity consumption faces complication, though, if purchasing a car for oneself becomes a thing of the past as a result of driverless cars. In this case, a rethinking of the fundamentals of our relationship with the vehicle and our projected ideologies regarding the automobile will be acutely necessary as society and culture bend to accommodate this new technology. It is from this need to alter our cultural constructions of the car that apprehensions emerge because of the degree to which our national identity revolves around the meaning of the car.

As described above, individual autonomy is largely wrapped up in owning a car. In fact, the freedom of mobility that having a vehicle allows, is one that very few are willing to give up. The convenience of hopping in your car that is parked right outside your house and driving it

¹²² Ibid.

directly to your destination without stops that are not tailored to your transportation needs is a type of freedom and immediacy that has captivated our society. When asked what the car as a method of transportation means to her, Sawyer, a female college student from Oregon who is studying psychology, responded,

“I think that cars are very important. I like that sense of autonomy. I was working at this place over the summer and it was 20 minutes by car from my house and one day I had to take the city bus and it took me an hour to get there! That’s just crazy! That’s why not having a car is impossible because... cities are just so huge that I would feel stranded if I didn’t have my own car because public transportation is terrible.”

The hypermediacy that Sawyer applies to public transportation and her desire for immediacy in the context of door-to-door travel with little to no compromise, is an important idea when it comes to the narration freedom that is associated with the automobile. In this case, hypermediacy is defined as the acute awareness of the transportation medium as a result of its imperfections or inconvenience involved in its use. This awareness often results in frustration at the lack of a seamless transportation experience. Immediacy is defined as the opposite, the smooth transportation experience in which the rider is not necessarily made aware of the faults in their method of transportation because of the overall convenience.

Simultaneous to her acknowledgement of the autonomy that she associates with her car, Sawyer illustrates the necessity of her car to navigate the city and her perceived inability to travel without a vehicle. The urban sprawl created as a result of the automobile that concurrently demands the use of the automobile proves problematic for Sawyer. This is illustrated by her feeling of being stranded if she doesn’t have a car due to the spread out nature of her city. Jia, a female college student from Oregon who is studying computer science shares this sentiment, saying, “cars are such a vital part of everyone’s life. Our society is built around the fact that you have a car. Getting around that for so many people is near impossible. So much of America and the world is totally isolated so you do need a car. We’re so far from having a society that does

not revolve around a car.” The freedom that the car offers is paradoxically accompanied with the enslavement to the car as a result of the urban sprawl that the automobile itself enabled. As a result of the sprawl of cities, the car is ingrained in transportation discourses and the constructions of life in America. How the introduction of driverless automobiles could change this American identity, though, inspires fear because of the expected decline in car ownership. This anxiety emerges as a result of the projected car-sharing economy that will follow the introduction of driverless automobiles. A shift that will require redefining the freedom associated with owning an automobile so as to accommodate this new economy.

The automobile embodies many American ideals including liberty, autonomy, and private property and it is largely due to these qualities that the car has been cast as a cultural symbol in the United States. With the constantly developing and expanding suburbs leading to longer commutes and decreasing walkability, the automobile has become one of the choice ways by which people get from one place to another. In this section I addressed the ways in which automobile advertisements promote ideologies that affix notions of freedom and self-determination to the car and how those beliefs are carried into, and fulfilled, in everyday life. These concepts are necessary to understand the degree to which the automobile is rooted in the narrative of transportation as imagined by my interlocutors. These perceptions are also important in the larger context of my research because they situate the vehicle as a central part of the American identity and illustrate that it is much more than simply a commodity. The centrality of the vehicle in the national identity also highlights the fears about how the individual’s relationship with the vehicle could change as a result of driverless technology.

Status

The automobile offers an interesting cultural site because while its interior is largely private, its exterior is part of the public sphere. This is to say that the automobile is one of the few cultural artifacts that facilitates a public display of status while simultaneously offering the owner a private space to inhabit. Whether the status that a car indicates revolves around economic success, autonomy, or maturity, the absence or presence of a car and what kind of car a person owns is intertwined with an abstract form of social capital. In this section I will focus on the distinct and nuanced meanings of the automobile as a status symbol and the ways in which achieving social capital through one's vehicle could change as a result of driverless cars. These socially constructed meanings of the car and the establishment of the car as a measure of status illustrates one facet of the complex relationships that individuals have with the automobile and the fears associated with what could happen as a result of autonomous technology.

Narratives regarding the meaning of the car, especially as a symbol of status, differ from person to person and also change over the course of an individual's lifetime. Ellery, a man from Oregon illustrated just such a shift when he reflected on the meaning of the automobile in the context of his life.

“Well, initially they were just about transportation, and then as I got older and made some money I was able to get cars that were more of a status symbol. Now it's really just transportation. Now I just want a car that works and that's good for the environment, I want a car that can efficiently get me from one place to another.”

Ellery brings up this transformation in terms of the way that he viewed cars, a transformation that marks different periods in his life. This movement from a focus on transportation to status and then back to transportation is important because it illustrates the constantly fluctuating meanings of the automobile. These shifts depend upon one's age, career, family size, economic means, values, and other factors. Furthermore, the addition of sustainability to Ellery's desires regarding his car choice illustrates the current time in which we live and the focus on eco-friendly alternative energies in an effort to ameliorate environmental degradation. Ellery's new

desire for a car that runs efficiently illustrates the malleability of our wants, while also showing the adaptability that people have when it comes to the social, political, economic, or environmental issues that can inform a person's preferences.

While Ellery brings in the invaluable perspective of what the car means across a lifetime, Sawyer, explains how she feels about cars and the ways in which they mark a sense of maturity and freedom for teenagers as they begin to conduct their lives apart from their parents.

“I guess I feel like it's a sign of maturity. It's definitely also a sign of freedom. You're independent. You're your own person and you're developing on your own away from your parents and you get to start having your own life away from them that they don't know about and stuff like that. So having a car means that you're being your own person and you aren't reliant on other people.”

The maturity and freedom that Sawyer describes equates to social status in the eyes of teenagers. Thus, rather than the price of the vehicle corresponding to status, as is the case with most adult consumers, it is what the car allows a person to do that indicates prestige for younger individuals. Additionally, when she speaks about the car as a symbol of maturity, independence and autonomy, while those same qualities are attributed to cars throughout one's lifetime, these characteristics are often only deeply important for adolescents and the elderly. For the elderly, or those who have had their licenses revoked due to old age or disability, that independence and autonomy is taken away. Meanwhile, the freedom of having a car is often taken for granted by adults who drive regularly because it is such a natural thing. It makes sense, then, that the social cachet achieved by both the newly licensed and the newly unlicensed is somewhat similar because in both cases the essential function of a car, its mobility, comes to the forefront due to the autonomy, and thus status, that mobility enables. Status is often associated with economic success, but Sawyer complicates this definition and adds layers of complexity by incorporating the abstract social capital that is associated with autonomy and freedom to the conversation. Both Ellery and Sawyer's notions of how the car symbolizes social status illustrate aspects of

automobile culture that could drastically change in the context of driverless cars. The adjustments to the ways in which social cachet is achieved, in the midst of this transition, could cause fear and anxiety for those who put stock into what their car suggests about their status.

While Ellery and Sawyer described the fluid meaning of the automobile as it exists today as a symbol of status, I spoke with Victoria, a mother of two from Oregon who works with pathfinding at a technology company and who has been in the technology industry since 1993, and Tim, a man who works in the semiconductor industry as a user experience practitioner, about how driverless cars could change the way in which a symbol of status is achieved. Victoria explained that the first industry that driverless cars are projected to disrupt is ridesharing, or MSPs. As Victoria describes, the drivers for MSPs could soon be pushed out and replaced by driverless technology. This shift, she claims, will result in the modification of how individuals obtain social capital through their mode of transportation.

“Now the sharing economy has made it possible for people to get around without owning a car. And a lot of people who own a car are choosing not to own cars. The identity that they’re getting their social cachet from is one of being environmentally conscious by not owning a car and by participating in this sharing economy.”

The shifts that Victoria speaks about in the context of the sharing economy and the many ways in which automobiles could become depersonalized and enter a more public sphere are important because they challenge our current ideologies about the meaning of the car as a symbol of status. For example, while maintaining the automobile as a symbol of independence, Victoria notes that the process of gaining social capital from having a certain type of car could be transformed by self-driving cars. Her note that what constitutes a status symbol could very much change echoes what Ellery said in the context of sustainability. While Ellery touched on the idea that now he desires a car that is environmentally friendly, Victoria takes that idea a step further, asserting that Ellery’s desire to have a more sustainable mode of transportation is, in fact, the symbol of status and the mode through which he is obtaining social cachet. According to Victoria, eventually

simply desiring a more eco-friendly vehicle will not be enough, though. Rather, giving up owning a vehicle in favor of participating in the ridesharing economy will become the new indicator of status.

Victoria's commentary about the changing avenues for achieving a symbol of status through one's method of transportation was echoed by Tim. However, Tim's view was slightly different. Rather than focusing on other types of social capital, such as sustainable efforts, as symbols of social cachet represented by a person's mode of transportation, Tim concentrated on the way in which the car could become depersonalized and by extension the different approaches to attaining status that, that situation would require.

“I think that the question is not your car or my car, it's less personalized. It's more about *the* car. I think there will be less ownership and it'll be more about the ride, more about mobility. So I think that's a big shift, right, because it becomes less of a pronoun before the car and more of the car just as a noun.”

In the a situation in which the car is viewed as a noun, Tim explained that someone might say, “I like to ride in luxury so I subscribe to X service for \$Y per month.” In this case the person would be investing in a caliber of mobility on demand rather than a single car. In other words, the cars provided by an MSP might be different for each ride, but they are all within the same price range. Therefore it is not “my” car that is arriving, but “the” car due to the lack of direct ownership. In this scenario the vehicle remains a symbol of status, but rather than purchasing a single vehicle, one is investing in a plurality of similar vehicles that are at their beck and call. Both Victoria and Tim focus on the automobile as a commodity and as a status symbol. However, they both acknowledge that with the new type of car-sharing economy that self-driving cars will likely bring about, the process by which one obtains the mark of status through their vehicle could be very different than it is today.

The varying ideas described by Ellery, Sawyer, Victoria, and Tim illustrate the complex nature of the meaning of the automobile and the elaborate ways in which individuals obtain

social capital based on their mode of transportation. This nuance is important in the context of our broader conversation of automobile culture and how it could change with the introduction of driverless cars because of the level to which individuals imbue the car with symbolism and recognize the vehicle as an indicator of status. The significance of the car as a measure of social cachet, as described by Ellery and Sawyer, illustrates the cultural embeddedness of the car while simultaneously alluding to the social unrest that could follow the establishment of self-driving cars in our transportation repertoire due to the uprooting of a meaningful measure of status. Meanwhile, Victoria and Tim offer insight into new methods of status formation through redefined types of social capital as a result of driverless cars. These points of view show the attachment that individuals have with their automobiles beyond simply a disposable commodity, thus adding a layer to the cultural landscape that autonomous vehicles could disrupt and the anxieties associated with this technological advancement.

Identity

More than simply utilitarian, for many, an automobile is a facet of a person's identity that is on public display. Early on, "consumer choices were limited and personal tastes were not to be indulged. Today, the American consumer has hundreds of models from dozens of makers to choose from. Once buyers select a make and model they can individualize their cars further by choosing options, accessories, and colors".¹²³ These personalized touches and adjustments are not only limited to what the manufacturer will allow. In fact, "many Americans, especially those hundreds of thousands who customize their cars, collect them, or treat them as a kind of canvas in the art car movement [see] their cars as a form of self-expression".¹²⁴ In this case the

¹²³ Catherine Lutz and Anne Lutz Fernandez, *Carjacked: The culture of the automobile and its effect on our lives*, 75-76.

¹²⁴ *Ibid.*, 78.

automobile is appropriated, objectified, and incorporated into the consumer's life.¹²⁵ This type of automobile commodification goes beyond simply the desire for the car as a means of mobility, and illustrates the way in which cars can be modified to reflect the personalities of their owners.

The automobile has a way of symbolizing not just status, as we touched on in the previous section, but also it is believed that it represents who the owner is and what their values are. In fact, with so many options for automobile modifications available for car owners it is possible to create a car that is just as unique as someone's personality. In a conversation about what the car means to her, Claire, a young woman from Oregon, explained,

“I think that what kind of car a person has or wants says a lot about who they are as a person. Everyone has their dream car. One of the questions I always ask when I'm trying to get to know a person is what their perfect car is. Mine is a Mercedes G-Wagon. I feel like it just fits perfectly with my personality. I just like what a G-Wagon says about a person.”

Claire's commentary illustrates the way in which individuals construct their identity, the identity that they wish to display to others, or even the identity that they hope to have in the future, around the vehicle that they own or that they desire to own. The importance that Claire places on vehicles and her imagined ability to know a person through their choice of car is demonstrated by the fact that she asks people about their ideal car when first trying to get to know them. The notion that someone could get to know another person by way of their ideal vehicle exemplifies the weight that is put on cars as social artifacts that act as a manner by which identities are constructed and demonstrated. The importance of the car's ability to portray an identity and take part in constructing that identity illustrates the deeply embedded nature of the automobile in our social culture. What's more, driverless cars directly threaten the identity construction that results from owning a specific vehicle that a person believes symbolizes their personality, individuality, and/or values. This is because the innovation is likely to result in a car-sharing economy in

¹²⁵ Eamonn Carrabine and Brian Longhurst, "Consuming the Car: Anticipation, Use and Meaning in Contemporary Youth Culture," 187.

which people do not personally own a car and are therefore unable to use the automobile as a public display of themselves.

This same sentiment is echoed in Tripp's comment about cars and the construction of individuality through one's vehicle. In his explanation, though, he focuses on the idea that the car is comparable to a large mobile accessory that a person can use to demonstrate to everyone on the road who they are.

“I think that it's really important to have a car that's just your own because that's your space inside the car and that's something that you can customize on the inside and outside. Even if you don't want to personalize your car beyond the color of the interior and exterior, the kind of car you drive says a lot about your values and what types of things you like to do.”

Tripp's ideas with regard to constructions of identity through the personalization of one's car further exemplifies what Claire brought up. Specifically, Tripp mentions the space within the car that can be altered and designed as an environment for more personal needs while the outside is used as a sort of metaphorical calling card, showing people who you are and allowing onlookers to extrapolate aspects of your character. Tripp also brought up the notion that it is not just wealth that a car signifies about a person. Rather, just from the color of the car you can tell something about the owner's preferences. What's more, Tripp also alluded to the idea that the brand of car also indicates a person's core values or activities that they enjoy. This directly links to the advertising mentioned earlier in this chapter and the constructed ideologies that automobile companies portray in their advertisements. These types of advertisements establish car makes and models as ideal for a certain kind of activity or use. These representations target certain demographics and as people that share an interest begin to purchase that kind of car in response to the advertisements, that car is reinforced as the quintessential car for a person who does, enjoys, or values one thing or another. Autonomous cars jeopardize this type of public displays of identity and the ensuing stereotyping that occurs as a result of advertising in combination with

personal experience. It is easy to see, then, the trepidation in the face of self-driving cars due their potential to threaten this form of self-expression.

Both Claire and Tripp's commentaries exemplify the formulations of personal and public identity through vehicles while simultaneously illustrating the nuanced relationship and narratives that people construct with regard to cars and the sense of control that one has over the identity that they show to the world based upon their choice in vehicle. In this way, Claire and Tripp reveal the attachment that people have to their cars as reflections of themselves and further complicate the automobile as a cultural artifact rather than simply a tool or commodity. Based on the demonstrated importance of the car as a form of identity construction, it is clear that if driverless cars eventually lead to a decline in car ownership, people would struggle to change the way in which they present who they are to the public world. This is especially true if personalization more than simply opting for a certain price range of shared vehicle was made impossible.

Control

While control, to some, may manifest itself in control over the identity that one wishes to portray to the world through their vehicle choice, others seek control in a different sense, namely, the control that one has over their life and schedule as a result of owning a car. Themes that came out most prominently with regard to this type of control were twofold. First, the control that one has over their schedule. Second, the independence that one has while driving. These themes are both illustrative of things that could be drastically changed by autonomous vehicles and by extension the fears that people have about giving up the aforementioned aspects of control. Additionally, these motifs further demonstrate the embeddedness of the car in everyday life and the complex nature of the relationships that humans have with their vehicles. This goes to show

that cars are not simply disposable commodities that lack attachment in our lives and further complicates the disruption that autonomous vehicles will have on our cultural landscape.

While driving in Los Angeles during rush hour, alone in my car, I was stunned to find that the carpool lane was largely unpopulated. This was in stark contrast with the bumper to bumper traffic that I was stuck in. Looking around my immediate vicinity I realized that everyone was alone in their car, just as I was. Why I had chosen to take my car was based on the fact that it seemed comparatively easier to simply get behind the wheel and go to my destination than put in a bit more time to search out a route using public transportation. Using the train would have most definitely been faster in this context. In fact, I had seen two pass by in both directions while I had moved a mere hundred feet. Reflecting on this moment I can't help but realize my odd rationalization for taking my car. I didn't want to be bound to the public transportation schedule which would have required me to organize my day in the city around a timeline that was not my own. Realistically, though, I had bound up my schedule with those of the hundreds of other individuals with whom I shared the freeway. In this way my schedule was not my own, in fact it was contingent on factors that were far outside of my control and that were unknowable to me, arguably more so than the factors that could occur while taking public transit. Despite my realization I have traveled in my own vehicle to and from the city numerous times, each time somehow rationalizing the inconvenience of public transportation and willingly subjecting myself to stop and go traffic for miles.

The idealization of constructing one's own schedule was echoed in something Tripp said during our conversation,

“Driving is important because it lets me decide where I want to go and when. Not relying on others to pick me up or take me somewhere eliminates a stressful part of logistic planning. I don't even really like ridesharing services for that reason, because I don't like having to wait on other people.”

The desire for control that both Tripp and I share when it comes to constructing our own itineraries, but in doing so being trapped by the schedules of the other road users, is an interesting facet of the nuanced way in which individuals construct a relationship with their vehicle. It is interesting because it is irrational and demonstrates the narratives that we devise in our minds to justify our seemingly nonsensical actions. What's more, Tripp's dislike for using MSPs to get around because of his distaste for waiting on people or in this case, things, could prove difficult with self-driving cars. Especially given that the MSP industry is projected to be the first major application of the technology. This is yet another example of the way in which controlling one's own schedule is bound up in owning a car.

Sawyer also spoke of this same aspect of control and the lack of control that public transportation seems to offer passengers.

“It's nice to be at a location and instead of having to wait for a car you can just get into your car and go and do this and do that. You're in control of it. You can change your mind when you're on your way somewhere and make a pit-stop. It could also translate to you being in control of your time and what you're doing that day and how much time you allot to different things.”

The ideas of control and lack of reliance on others that some people project on their vehicles is evident in both Tripp and Sawyer's comments about their aversion to waiting on other people, instead favoring the immediate satisfaction of getting into their own cars and going wherever they want to go. This also ties in with the idea of having the liberty to make an easy pit-stop. Through their comments, as well as my own experience, the control that one has over their car and by extension their time and schedule further highlights the unique relationships that some people have with their cars. Relationships that are likely to change with new vehicular technology.

Independence while driving is also an important aspect of having a personal vehicle. This is most pointedly illustrated in instances in which that independence is revoked, such as when a

person's driver's license is revoked due to old age. In a conversation with Mimi, a woman from Oregon, she explained that watching some of her friends getting their licenses revoked was a scary and worrying thing because the idea that she would not be able to have a car to herself and the independence that comes with having a personal vehicle was a very upsetting part of getting older. Furthermore, the same topic came up with Ellery who explained that while he was worried for himself and when the time would come for him to forfeit his license, he was mostly thinking about his son who recently had to give up his license due to vision impairment. According to Ellery the lack of independence that his son had been feeling was very profound because the lifestyle change had required him to organize his agenda and weekly errands around the schedule of when the driving service that he had hired was available to him. This schedule had ended up being very difficult for him to assimilate to because the small time frame necessitated speedy grocery trips and route optimization so as to save as much time for in-store shopping as possible. Since our conversation, his son still uses a ridesharing service but according to Ellery, he longs for the independence that having a car offered him. Both of these conversations highlight the importance of independence as an aspect of control that is projected on the car and the desire for control on a psychological level exhibited by so many drivers.

Tripp, Mimi, Ellery and I all share a similar experience with driving and the desire for control over one's own time. In this way, the car is revealed in yet another light. This time it is tightly intertwined with the human desire for control. Viewing the automobile as a facet of life that enables humans to take part in activities according to their own timeline and that has the power to elicit trepidation when considering the eventual need to forfeit that autonomy, illustrates the degree to which the car is rooted in our lives. This new meaning of the automobile, once again, complicates how the car exists in our lives and serves as further evidence that the car is not simply a commodity, but a cultural artifact. Individuals desire the control of owning and using their own vehicle, desiring the immediate satisfaction of the ability to hop into the car and

move from place to place. The introduction of self-driving cars could make this difficult, especially if these vehicles emerge as MSPs, as they are projected to, because they could infringe on the control that individuals elicit from their vehicles.

Leisure

While driving for some may be associated with chores, others revel in the act of driving for the sake of recreation. The relaxation or leisure that some people feel while driving emerged from my research as an important aspect of what the car means to people and is shrouded in fear when self-driving cars come up in conversation. This theme is revealed in two ways, first through the decompression that occurs during a commute and second through the relaxation that one elicits by taking a drive. The importance of driving for pleasure highlights the fears about autonomous vehicles and how they could drastically change and eventually eliminate the act of driving.

The commute is often seen as a time during which the driver is able to mentally prepare themselves for their destination or relax after an activity that just came to a close. While the commute may be a bothersome part of the day, this time is actually precious because it allows the driver a period during which they are unable to engage in tasks that take their attention away from the road. This allows the mind to rest and focus on a singular task: driving. While conversing about commutes and the importance that driving to and from work or school has in terms of preparing for an activity or decompressing from an activity, Ella, a woman from Silicon Valley who is part of a research group focusing on social science research that informs the development of software for autonomous vehicles, mentioned the following:

“I once read a study that had analyzed it and came up with the figure of 20 minutes as the prime amount of time for a commute in terms of people using the time as you suggested. Decompress, have time for themselves, think ahead, so that kind of thing, you know. If

you're going more than that then that's when you start to get frustrated that it's a waste of time."

The study that Ella references illustrates the importance of the commute and reveals the sweet spot for commute time with regard to enabling the driver to relax and reflect on their day while also getting ready for what is to come at their destination. This is important because it highlights the widespread use of the commute to decompress and have time to oneself before engaging in another activity. This therapeutic relationship with the car as a personal space in which one can dictate almost every aspect of the environment and have time to oneself with the excuse of driving to ward off any responsibilities that might arise, is important for many drivers.

What's more, the excuse of needing to focus one's attention on driving allows for what could be an important break from other tasks, especially in the context of a commute. While the act of driving is a task in and of itself, in this case it is an enjoyable task and one during which it is unlawful to multitask, the perfect excuse to focus one's mind on just one activity. From the pleasure involved in driving emerges a fear of self-driving cars taking this time away from the commuter. Lilly, a female college student from Connecticut who is studying law, explained a situation that in many ways, reflects the type of transportation culture that self-driving cars could bring about.

"My aunt is a very stressed person. She took the commuter train and the commute itself was making her high strung because it was like she was already at work, she had five minutes between leaving her house and getting on the train and then she would start working remotely."

Lilly's anecdote exposes what condensing the time driving between home and work and the mental preparations that take place in that window can do, as illustrated by her perception of her aunt as high strung and stressed. While this might free up the travel time for other activities, it also means that the mental preparation for, or decompression from, an activity has to be shortened or eliminated. Without that time in the car to disengage with the working world and

dedicate time to participate in the betterment of one's mental health, we could find ourselves living in a world in which people might be stressed and high strung as a result of the pressure to constantly be productive. Lilly's commentary directly represents the fears associated with the possibility of losing the ability to separate oneself from a day of toil through the act of driving. Both Ella and Lilly speak to the importance of the act of driving, specifically during the commute. This shows yet another way in which the vehicle is affixed in our lives as a cultural artifact and further exemplifies the fears about the ways in which driverless cars could change our relationship with the car.

The decompression that one can elicit from taking a drive emerged as an equally important aspect of driving for pleasure. In this case an individual will decide to go for a drive in order to unwind or have time to themselves to think. While the commute serves as an almost accidental time for relaxation and preparation, in this case, people will specifically seek out the driving experience in order to elicit the alleviation of stress. For example, while speaking with Carol, a mother of three from Oregon, she brought up an interesting bartering tool that one of her close friends uses with her son.

“She will tell her son that if he does homework for two hours he can take a drive in her Porsche for an hour, and always takes the deal.... Apparently he really likes driving to calm down and relax and I mean it's a Porsche so it's really fun to drive.”

This exemplifies the calming nature that some people identify with driving. What's more, the use of driving as a therapeutic activity or tool, namely the enjoyment that people get from driving sports cars, points to the importance of the act of driving. For some, the thrill of driving a sports car can't be beat, whether it's the engine, the responsiveness, or the experience as a whole, some people just can't get enough of driving if the car in question is a sports car. This activity could be significantly changed by driverless cars and with the automation of driving, challenges might emerge in terms of finding other ways to elicit the same feeling from other stimuli.

Similar to Carol's friend's son, in my conversation with Ivana, a female college student from Arizona who is studying economics, she described the clarifying experience of driving and the almost therapeutic experience of aimlessly driving just for the sake of driving.

"I really like driving, I use driving to calm myself. Sometimes if I'm very anxious or stressed I will go drive. I feel like for a lot of people they get joy out of driving. I usually drive off campus to study because it's a nice spatial separation from social life on campus to work life in a cafe or something. Plus, I really like the drive because I can think and relax."

For Ivana, the calming nature of driving in the face of stress is very important for her. In fact, she explains that she often drives off of her college campus to coffee shops to do work because the travel time to and from the study spot allows her time to prepare for what she has to do. During this time she maps out the work that she has to do in her mind. Then, when she's done studying, the drive back to campus gives her a nice separation between finishing her work and returning to her dorm room. She uses this time to clear her head and prepare for whatever the next phase of the day will bring. In her answer, Ivana combined her enjoyment of commuting from campus to a study spot with her love of driving to unwind, demonstrating the significance that the act of driving has in her life. Through her mention of how much she enjoys the act of driving, Ivana reveals the underlying fears associated with autonomous vehicles and the way in which it could change her relationship with the car.

The importance of driving as a manner by which people decompress, whether during their commute or specifically taking a drive to relax, proved to be a strong aspect of the emotional relationship that individuals have with their car. Moreover, these narratives challenge the celebration of driverless cars as freeing people from the tedious task of driving. In fact, they offer a unique rethinking of the assumptions of the drive itself. This angle further complicates the meaning of the automobile and refutes the car as simply a commodity, while simultaneously

uncovering the fear regarding how driverless cars could fundamentally alter the aspect of the vehicle that these individuals identified with most: driving.

Conclusion

The automobile is a deeply embedded facet of our lives and in the face of this technological shift to autonomous vehicles it is important to analyze the nuanced narratives that individuals have about their cars so as to reveal the complex ways in which cars exist in the American cultural landscape. While transportation in the United States could use improvement, the techno-fix that driverless cars represent does not solve the current transportation problem. This technological development is not a simple solution, rather, it is far messier because it both effects the relationships that individuals have with their cars, and it also does not address the public transportation problems that plague so much of the country. The public discourse discussed in chapter one focused primarily on the car as a commodity, essentializing it to simply its technical function as a mode of transportation. This forgets the importance of the car as a nuanced and unique aspect of our personal lives. In this chapter I discussed ideologies of freedom related to the automobile, the car as a symbol of status, the automobile as a form of identity construction, the sense of control that the vehicle offers, and the decompressing experiences that people elicit from the act of driving. These topics are important because they reveal the individual reactions to the car and the complex nature of relationships that people create with their vehicles. Furthermore, these relationships illustrate the fears that arise about autonomous vehicles and the unknown ways in which they could alter our relationships with the car. The elaborate relationships that individuals have with their cars uncover and magnify the fears about self-driving cars as a technological innovation and how it could alter the meaning of the automobile.

3

The Environment Within Cars as a Simultaneously Public and Private Space

Introduction

The space within vehicles, at times solitary and at times shared, is a site for unique cultural occurrences. The interactions that we have with one another while riding together are a unique form of forced intimacy as we, cocooned within the vehicle, hurtle through time and space, sharing views of the outside world rushing past and participating in either silent or conversational social interactions. In the context of driverless technology, the perceptions of the intimacy within the vehicle emerged in two ways. First, the private intimacy of a car that is shared with friends, family members, or colleagues and the ability to build upon an existing relationship in a mobile room as a result of self-driving technology. This form of intimacy insists that the vehicle in question be either personally owned or shared only by individuals who know one another. This perception is based on how the automobile is currently used, whether it is a personally owned vehicle, a taxi, or another ridesharing service. The second perception of intimacy materialized as public intimacy and revealed fearful projections into the future of transportation. These projections included the loss of the driver as a moderator of the space within ridesharing cars and the gender proxemics that come into play as ridesharing services offer “pool” transportation options that place strangers with pick-ups or destinations along a similar route, into the same vehicle in a carpooling scenario. This fear is illustrated by the current difficulties that individuals have when placed in a similar situation. However, in the context of autonomous vehicles this mode of transportation is complicated because there is no longer a driver to act as a common denominator for the passengers. These two perceptions of intimacy

within the vehicle and the transformative effects of autonomous vehicles illustrate the fears about this technology in the context of social relations and intimate, enclosed environments.

Additionally they add invaluable layers to the macro-level discourse currently taking place in the media.

Private Intimacy

The car as it exists is an incredibly intimate environment. When conversing about driverless cars and the opportunities that the technology could afford individuals in the context of private intimacy, my interlocutors revealed two primary ways in which they believed that this new type of transportation could ameliorate the shared experience of passengers in a car. These narratives included the ability to engage with other passengers and build upon existing relationships in a sort of mobile room and the gift of enabling the driver to participate more fully in conversation with their passengers, especially in the context of a parent picking up their child from school. Ultimately, these individuals pictured driverless cars as allowing for the extension of the quality time that riding in a vehicle with someone offers. In fact, they revealed in what they considered would be a newfound ability to connect and converse with the people with whom they were sharing the space. These imaginings about how driverless cars could improve the private intimacy within the car demonstrate the ways in which individuals speculate about the future of transportation and how the culture that happens within the car will be altered by autonomous vehicles. However, there are also less optimistic perspectives on self-driving technology as it stands to affect the intimacy within the car. This fear revolves around the removal of the driver and the potential for less shared time in cars because people, especially children, would not need a parent to drive them from place to place.

The quality time that the driver and the passengers spend in the car emerged as an important aspect of transportation culture that could undergo a large with the introduction of driverless technology. Specifically, Carol reveled in the perceived ability for a personally owned autonomous car to allow the driver to relinquish the demanding task of driving and engage in meaningful conversation and relationship building with other passengers.

“It’s a forced intimacy when you’re in a car, it takes everything else away and it boils everything down to you and the person you’re with. In a self-driving car, you could be interacting even more with the people you’re sitting with. I really think it’ll be more like when you travel by train with a focus on being more social.”

This newfound ability to fully participate in the intimate social happenings during a car trip illustrates a way in which people imagine themselves using driverless technology in the context of a personal vehicle. This ties in with the perception that this technology, through an increase in the forced private intimacy, could facilitate the deepening of relationships. Additionally, the comparison to traveling by train and the liberation with which all passengers can engage in an activity of their choice demonstrates the notion that this technology could allow for new kinds of recreation during a car trip. Furthermore, the reimagining of community within the car and the lack of a hierarchy regarding who is driving, who is in the passenger seat, and who is in the back seats, also plays a part in changing the collective and social atmosphere in the car. This positive outcome of increased socializing, however, only came into the conversation when individuals are sharing the space within the vehicle with people that they know.

Taking the narrative of the car as an intimate mobile room in which socializing with friends and family can take place, the idea that a self-driving car could function as an environment that might encourage parent-child conversations was of primary concern to Heather, a mother of two from Oregon who designs and tests software for infotainment systems in cars. In our conversation she concentrated specifically on the ability to connect with her children during

their commute to and from school, an opportunity that she currently did not feel that she was able to fully take advantage of because of her job as the driver.

“I mean one of the reasons why it’s hard to talk to people and give them your full attention is because you’re driving so you can’t focus. I just had to bring my son somewhere, and he wanted to tell me what had just happened to him, but I could only listen when I wasn’t busy trying to figure out where I was going.”

Heather’s desire to pay undivided attention to her son as he describes his day and her acknowledgement that this would be greatly facilitated by a vehicle with an autonomous mode, illustrates the changed quality of the time that people predict they would get to spend with their loved ones in the car.

Carol had a similar sentiment, explaining that she longed for the time when she drove her children to school because of the intimacy in the car and how it was the perfect space in which she could connect with them.

“It gave me time to talk with my kids in a space where they couldn’t walk away from the conversation. I really feel like that time was so precious because I could ask them all about their days. But now they have their licenses and they go driving places by themselves and that’s great because I don’t have to be their chauffeur but, I don’t know, I miss it in a weird way too.”

Carol’s description of the way in which she used the space within the car as a conduit for conversing with her children as they drove to and from school illustrates the cultivation and maintenance of parent-child relationships that takes place within the car. This type of situation, as Heather pointed out, could be greatly enhanced by self-driving cars because they would allow the space to maintain its intimacy but would enable the parent to relinquish the task of driving in favor of focusing on engaging with their children. Carol also mentioned how the space within the car would be changed by autonomous vehicle technology, however, her outlook took a more negative tone.

“I feel like self-driving cars would be just like it was when my kids got their licenses. I mean, if you had a self-driving car then you wouldn’t have to take your kids to school once they got to a certain age and you could lose so many years of checking in with them

in the car because a self-driving car wouldn't really need a parent to be in it to get the child safely from point A to point B.”

The point that Carol brings up about driverless cars and their ability to transport children without an adult from one place to another exemplifies an opposing point of view compared to what Heather was saying. While Carol does acknowledge that with a small child it would be nice to be able to engage more fully in conversation with them, rather than having to watch the road and navigate, the potential for children to be able to travel alone at a much younger age than they are currently able, points to the potential to lose that quality time. This assertion demonstrates the predictions and narratives that individuals have regarding the private and intimate environment within the car and how it could take on an almost entirely different form because of driverless technology.

The sociality within the vehicle as described by Heather and Carol can be extended far beyond the perceived ability to amplify conversational activities with one's children. In fact, this impression of the ability for driverless cars to enhance the social scene within the car can be applied to other social situations within the vehicle as well. By freeing the driver from their responsibilities, they can engage more fully in the social atmosphere within the vehicle. The private intimacy within the automobile and the culture that happens there stand to undergo a large shift and while this shift could lead to an enhanced social experience within the car, the narratives that my interlocutors described ultimately reveal the fears associated with losing that intimate time altogether because of driverless technology.

Public Intimacy

The automobile is not just a culturally saturated artifact in our lives. In fact, the space within the car is similarly imbued with meaning. The way in which our lives, namely our social

lives and the complex social interactions that we have in the cultural space within the vehicle faces a fundamental change. It is not just the sociocultural constructed meanings of the car that will be altered as a result of driverless technology, though, but the aspects of the interior environment too. This chapter unpacks the complicated definition of the environment within the car. Through this exploration the anxieties regarding how the space will be converted from private to public as a result of driverless technology come to light. The first section of this chapter aims to unpack the ways in which we might understand the social shift from the necessity of a driver to the absence of a driver in the context of the space within the car. The subsequent section delves into the current frameworks by which we are able to conceptualize this shift and the ways in which this technology will fundamentally reshape the atmosphere within the car. In the context of this topic I am using crowded public intimacy to define the intimate environment one experiences while in a crowded form of public transportation in which the passengers are forced to be in close proximity with strangers. Conversely, isolated public intimacy describes a situation in which a person is accompanied by between one and three individuals, as that is the normal carrying capacity of a car. These two types of intimacy offer a framework with which I will describe the changing landscape inside of the automobile as a result of driverless technology. But first, let us examine public transportation as a facet of the broader conversation of public intimacy.

Combining the Public and the Private

Public transportation offers an interesting type of space, a space that can be intimate in a crowded sort of way. This mode of transportation, as a result of its nature involves cultural intimacy as defined by Michael Herzfeld, PhD, “the recognition of those aspects of cultural identity that are considered as a source of external embarrassment but have nevertheless provide

insiders with their assurance of common sociality”.¹²⁶ Cultural intimacy is a tool with which the complexities of public transportation can be unpacked and applied to the intimate environment within a car. Specifically, I am referring to the socially constructed nature of the intimate environment within public transportation and the cultural sensitivity therein. Though cultural intimacy allows for a theoretical framework by which we can understand the roots of the behaviors exhibited on public transportation, it is not the only version of intimacy that I speak of. Intimacy on public transportation offers an interesting situation in which “people from many walks of life are removed from their personal spaces and find themselves in close physical proximity with strangers.”¹²⁷ The intimacy on city buses, for example, could mean that you are forced to stand or sit in uncomfortably close proximity to another passenger, perhaps even touching, in order to accommodate other passengers. This type of intimacy is expected during rush hour on certain routes and while many try to avoid such situations, it is inevitable that a rider of public transportation will experience a time in which they are forced to stand or sit next to another person a bit too close for comfort. The crowd in this intimate environment allows for a sense of anonymity and with the constant shuffling of passengers at the many stops along a given route, it is likely that a rider will be able to avoid the need to interact with other passengers for the entire duration of their ride.

This crowded public intimacy is linked to the size of the vehicle, train car, or trolley that one is taking. However, this is challenged when it comes to carpooling with an MSP. This carpooling scenario is even further strained when it comes to carpooling in an MSP without a driver. In the case of a small environment, consisting of four seats oriented as they are in existing cars, the intimacy of the space as we have experienced it previously, and as Carol and Heather

¹²⁶ Michael Herzfeld, *Cultural Intimacy: Social Poetics and the Real Life of States, Societies and Institutions* (London: Routledge, 2016), 3.

¹²⁷ Christopher C. Dierdorff, "The Intimacy of Place, 2012." Artwork | The Intimacy of Place, 2012, accessed April 17, 2018, <https://www.metro.net/about/art/artworks/intimacy-place/>.

described it in the previous section, is transformed into the unknown. The isolated yet intimate quality of the space within the car is a blank canvas on which culture can be drawn and redrawn. A passenger is no longer anonymous in their ridership, each passenger is known to the others due to the close proximity and small space in which you are forced to sit for the duration of your ride. Furthermore, unlike traditional public transportation this is as nearly a door-to-door service as possible, and therefore passengers are stuck together for the entirety of the leg of the trip that they share with no regular stops every few minutes.

In this case, it is up to the passengers to negotiate the culture that happens within the car and it could vary largely upon the personalities with which one is sharing a vehicle. In this way, while the culture and etiquette within public transportation as it exists remains relatively constant, based on the cultural intimacy defined by Herzfeld, the culture within each self-driving carpooling vehicle could be dramatically different depending upon various factors such as the genders of the passengers, the time of day, the location from which and to which the passengers are headed, among legions of others. This cultural negotiation that occurs inside the vehicle demonstrates the fears that surround the social relationships in the car and how driverless cars could challenge how we handle intimacy and public transportation in spaces that were previously considered private.

Currently, it is rare that the driver of a car and the passenger or passengers do not know one another, at least in some tangential way, though taxis and ridesharing situations break this norm. Even so, when one is sharing a taxi with another person other than the driver, it is rare that those two people are strangers. This concept, though, has been challenged recently by “pool” ridesharing services. In these instances the driver as well as the riders are all strangers, randomly placed together due to their proximity to one another at some point on their routes. The second form of intimacy, public intimacy, that surfaced over the course of my research focused around the “pool” ridesharing service and the uncomfortable and intimate environments that these

situations created. This kind of intimacy, the isolated public intimacy that one experiences in the midst of two or three strangers in a small space is incredibly unique.

Comparable experiences, during which one is traveling with strangers, is in public transportation in its various forms. However, these experiences are mediated by the crowd and often surveilled by various forms of authority. In an instance such as this it is easy for one to maintain anonymity as well as a certain level of comfort in the lack of isolated public intimacy despite the crowded public intimacy that might force people to stand or sit shoulder to shoulder. Furthermore, the sureness of the stops to come and the relatively short duration of time between stops reassures that there will be a shuffling of passengers, therefore maintaining anonymity over the period of ridership. The confidence that if a situation is uncomfortable, you could simply remove yourself come the next stop is comforting and in combination with that, the ubiquity of police or transportation authority at high-traffic stops might also serve as a reassurance.

The combination of isolated public intimacy and strangers, brings an entirely new type of transportation culture to light. It is this largely uncharted territory that reveals the nuanced projections that individuals have about the space within a shared self-driving car as well as the specific anxieties that people harbor about the possibility of experiencing an intimate situation with strangers. The introduction of self-driving vehicles that offer carpooling services, placing strangers in an unique environment largely unlike any environment that is experienced in the United States, is a source of excitement and anxiety for many potential riders as they look to the future. The potential for these spaces within the vehicle to become gendered, the seating politics that go along with a lack of authority that the driver brings with them, the new social interactions that could rise out of the intimate space within the automobile, and the potential for freedom that might be experienced by the elderly or disabled as a result of this new type of transportation technology all come into play when talking about the changing cultural landscape that we might experience as these self-driving taxis enter our transportation repertoire. Intimacy used to belong

to the private sector, but technology stands to bring that closeness into the public space and from this shift comes fears and concerns.

The Driver as the Moderator of Space

The driver of an MSP mediates the entire transportation experience for the passenger or passengers. In a “pool” situation in which two passengers are strangers they have the commonality of their transactional relationship with the driver. This shared relationship combined with the driver’s responsibility to facilitate comfort for everyone in the vehicle is the way in which MSPs currently function. However, this culture is dramatically altered when this moderator of the space, the common denominator for the passengers, is taken out of the equation. In this case there is no one with whom the passengers share a transactional relationship, they are simultaneously alone and together and must rely on one another to dictate the culture that happens in the vehicle for the duration of their ride. This scenario introduces a myriad of new opportunities and complications of how we, as people, interact with and conceptualize strangers with whom we must share a small and relatively compact space.

The transactional quality of a ride in a taxi or in a MSPs usually dominates the temporary relationship between the driver and the passenger(s). In the cases of taxis and MSPs the drivers are often screened and are deemed acceptable by some power whose judgement is accepted as sound and legitimate. Passengers willingly put their lives in the hands of strangers who are in complete control of the vehicle at all times, often without second thought. This willingness in many ways was initially reserved for taxi drivers, as Carol explains below, and it was only later that she accepted the safety that other MSPs offered.

“With a taxi you have their cab driving license displayed in the backseat so you assume the person is safe to be with. With Uber and Lyft at the beginning I was nervous about whether or not it was as safe as taxis. I guess originally I was just scared because it was new technology and new technology is always worrisome”

The assumption that an older technology, in this case a taxi service, being more reliable and trustworthy is not new or unique. People are usually wary of new technologies, even if that technology is a variation of a service that is already offered as in the case of taxis versus MSPs. What is especially interesting is when Carol admitted that she initially felt that cabs were safer due to their ubiquity, noting that she assumed that the drivers had been vetted, while at the beginning it was unclear whether MSP drivers were screened like taxi drivers were. Her views were changed when she started using the new services, her riding experiences consistently better than those she had had in cabs.

“The Lyft people that I have experienced lately - they want good ratings. So it’s almost like they’re constantly trying to win your business. It makes the experience a lot better and it’s more reliable. It’s really competition at its finest and it’s making the service better.”

What is important here is the competition that rating your driver brings to the forefront. The ratings, in Carol’s opinion, made the service much better because drivers were competing for stars, trying to win customers over. The drivers as the moderators of the experience within the vehicle, in the case of MSPs, are prompted to ensure a pleasant ride due to the fact that passengers were not simply paying for a service, but for an experience.

Furthermore, Carol’s mention of safety and the different calibers of safety that she initially thought existed between taxis and MSPs demonstrates another facet of transportation services. The question of safety and whether or not someone is safe with the driver shows an emerging fear regarding social relationships. In Carol’s initial perspective, she worried that the Ubers or Lyfts were not as safe or trustworthy. However, this view changed as she began to understand the ability for the technology to track the whereabouts of the vehicle including information about the driver. Additionally, Carol mentions the competition between drivers to furnish the best experience possible, thus bettering the service and making it safer and more

trustworthy. All of this goes to say that the relationship between the driver as a moderator of the space and the rider as the judge and consumer of a transportation experience allows for a mutual trust between the driver and the passenger that deconstructs any lack of safety that might have previously been associated with the technology. Autonomous vehicles, however, stand to complicate this situation and this complication leads to fear of the new technology.

While it is assumed that the driver and the passenger(s) are strangers, the transactional quality of the experience allows for a certain type of trust to be established between the participants. This situation was changed, though, when MSPs started offering “pool” options that boast lower costs for all passengers with the caveat that you will be sharing the intimate space within the vehicle with a stranger with whom you are not in a transactional agreement other than the mutual need for one another in order to keep the cost of the ride low. In this instance the driver’s role as the moderator of the space becomes even more important than simply furnishing a transportation experience like Carol described. This method of transportation comes with new and interesting cultural dynamics that we will speak about later in this chapter.

The driver is now not only in charge of ensuring the safety and experience of the ride, but also the route itself as well as the strangers who will be joining along the way. The addition of strangers sharing the role of “passenger” introduces an entirely new set of social rules that dictate the space within the vehicle that are not simply dominated by the transactional quality of the passenger and the driver’s relationship. In both cases there are many cultural differences that are taken into account. However, as with most work in the service industry, the driver is generally supposed to take on the role of the flexible companion. The savvy driver accepts that whether the passenger would like silence or conversation is not necessarily up to them, but rather, that it is up to the passenger to dictate the social atmosphere of the vehicle. These roles are changed when there are multiple passengers who are strangers to one another and who are also strangers to the driver. While the driver is still offering a service and is, therefore, at the whim of the passengers,

the driver is also there to moderate the experience for everyone, helping to set the tone for the ride.

The subtle dropping of social cues when a new passenger enters the car, joining the person who is already riding in the vehicle makes up the culture that “happens” within the vehicle. The social norms that dictate whether carpooling rides are chatty or silent, while situationally varied, are often governed by the social and interpersonal culture of the location, time of day, gender of the passengers, and numerous other factors. The sense of safety and comfort of the passengers is largely dictated by the driver because as the moderator of the space they are now not only in a transactional relationship with one passenger, but two, or possibly three. This transforms their role as they must now juggle multiple needs of multiple passengers, ensuring the comfort of everyone in their vehicle. This is a major responsibility, but when self-driving cars take the drivers out of the equation the culture that happens within the car is left in the hands of the passengers who are strangers to each other many fears arise in terms of what could happen in this new cultural landscape. One fear that came up time and again was a fear of how gender could complicate such an intimate environment. Especially with passengers who come from differing cultural backgrounds the sorting out of behavioral norms in a driverless MSP emerged as a major preoccupation for those with whom I spoke.

Gender and Proxemics

Autonomous MSPs offer an interesting cultural landscape for the study of gender and proxemics. Even in current MSPs in which the driver is present, carpooling with strangers introduces an interesting variable when it comes to gender and the use of space. The sorting out of whether male passengers are comfortable joining an existing female passenger in the backseat, female passengers are comfortable joining an existing male passenger in the backseat, or whether there are other facets of the riding experience that the passenger joining the ride will have to

attend to with regard to the social norms, surfaced as the major preoccupations regarding driverless technology in the context of MSPs. Carpooling in a MSP vehicle creates a unique “occasion for social relations - especially public gender relations - to be challenged”.¹²⁸ A space where strangers with varying cultural backgrounds are brought together into an extremely intimate environment, one in which the social norms have yet to be established due to the newness of the mode of transport. This new space is a space fraught with excitement and possibility but also with fear. In the context of driverless technology and MSPs, though, it is primarily the fear that surfaces because people don’t necessarily know how to grapple with this new and intimate social setting, especially in the context of navigating gender and the comfort of those around you in such close proximity.

This type of carpooling with a driver is not new, in fact, there are cities around the globe that have existing programs that offer ridesharing opportunities for passengers. In Lebanon, the social interactions and the seating politics in service taxis are well established and are as follows: a women never get in the front seat but a man always gets in the front seat even if the back seats are empty. This cultural norm within the vehicle is the product of various social behaviors coming together as individuals navigate this alternative method of public transportation. In the United States, where this is a new artifact of transportation, we are still trying to develop and establish these norms together, and whether they will end up the same or similar to how they are in Lebanon, for example, it is yet to be seen.

Let’s begin with the proxemics in a bus or train. The politics of passengering public transportation as it exists in the United States has, arguably, much lower stakes in terms of intimacy when compared to transportation via a MSP. Many forms of public transportation have signage that dictates the accepted or discouraged types of behavior in the space in order to

¹²⁸ Anru Lee, “Gender, Everyday Mobility, and Mass Transit in Urban Asia,” *John Jay College of Criminal Justice at CUNY Academic Works* (2017): 86.

manage the passengers as well as to establish rules that dictate normative social and cultural behaviors. For example, there are often signs placed around the interior of buses or trains that advertise the prioritization of the elderly, disabled, or pregnant when it comes to seating. Some signs even remind passengers to keep their voices low or music off in order to be accommodating to fellow riders. Additionally, the Metropolitan Transportation Authority in New York City, among many other transportation associations across the country, have established signage and campaigns under titles such as “Courtesy Counts” that include reminders such as: “Keep Your Stuff To Yourself,” “Step Aside To Let Others Off First,” and “Take Your Pack Off Your Back”.¹²⁹ These campaigns are designed to manage the culture that happens in these spaces, especially when they are crowded and riders are forced into close quarters with strangers.

Currently, many MSP websites contain a list of “community guidelines” that span topics such as “respect each other,” “give riders and drivers some personal space,” and “safety first”.¹³⁰ Another MSP lists subjects like, “be nice,” “be respectful,” “be safe,” and “be helpful”.¹³¹ These guidelines are all expanded into decrees that attempt to dictate passengers’ conduct while employing the transportation service but they are nowhere near as detailed as the guidelines in public transportation. In this way, MSPs do attempt to establish the culture that takes place within the vehicles, however, these rules are on the website, not on the applications and most people use the smartphone applications to complete the transactions. This could be an indication of the comparative youth of MSPs. However, I argue that it is actually the presence of the driver in the small space that lessens the need for detailed signage and guidelines for behaviors such as those on subways and busses.

¹²⁹ Metropolitan Transportation Authority. "Courtesy Counts." Mta.info | Courtesy Counts. Accessed January 27, 2018. <http://web.mta.info/nyct/service/CourtesyCounts.htm>.

¹³⁰ Uber, "UBER COMMUNITY GUIDELINES," Legal | Uber, Accessed April 01, 2018, <https://www.uber.com/legal/community-guidelines/us-en/>.

¹³¹ Lyft Inc., "Community Guidelines," Lyft, Accessed April 01, 2018, <https://help.lyft.com/hc/en-us/articles/360000100648-Community-guidelines>.

Apart from suggesting how the shared public space should be used, the signage that addresses priority seating is particularly interesting in the context of this section. The way in which seating politics are decided among passengers is situationally unique. The orientation of subway seats vary across cities, states, and countries. While some subway cars have benches that span the sides of the car all facing in, others have a variation of back to back seating as well as seating along the walls. Still others have seating oriented such that four seats are placed facing each other in a more conversational arrangement. The variations of the way in which the seats within a subway or train car are placed is both unique and interesting because in many ways it says a lot about the culture that is expected to happen in the space. While the seating in cars is standard, that is there are four seats in two rows all of which are facing forward, that could change and as the technology is further developed it will be interesting to see how the seating arrangements indicate about the social and cultural expectations of the space.

The automobile is largely seen as a personal or semi-personal cultural sphere, while taxicabs are viewed more as a public sphere due to the flow of people in and out of the space. Taxis are often painted a specific color, have a sign on the roof that reads “TAXI”, boast card readers in the backseat, have plexiglass dividers between the front and the back seats, among other identifying features that distinguish the vehicle as a more public version of the automobile. Meanwhile, MSPs possess different features indicating them as a quasi-public space such as stickers or removable signs that sit on the dashboard. The newfound ability for individuals to transform their personal automobile into a public space complicates the meaning of the automobile. What’s more, the flow of people in and out of the MSP is not just friends or family, rather it is people with whom the driver has a transactional relationship. What is interesting about this transformation, though, is the challenging of existing ideas and cultural constructions that exist when it comes to the space within an automobile.

The way in which we define our cars, as described in chapter two, function under the assumption that the car is a private space. Drivers and passengers often know each other in some way or another and the social rules that dictate what happens within the car over the course of a ride is largely defined by the social and the relationships between the people sharing the space. In this way, the interactions that take place within the car have already been sorted out due to the common history of the participants. What is interesting in the context of my research, though, is what happens when this space that has historically been a space of interpersonal relationships becomes a space in which the social culture must be sorted out on a ride-to-ride basis. Currently, MSP carpooling situations can be slightly awkward due to the unknown culture that a customer is entering into when they hail a car that a complete stranger is already riding in. The ridership of self-driving MSP vehicles in a carpooling context could very well become a community of individuals with a culture all their own.

To answer these questions we are first going to look at two different situations that people come in contact with, in a MSP carpooling scenario, one in which the driver is still present in the vehicle. This will allow us to establish the current seating practices of various individuals so that we can then flip the situation on its head, introducing a self-driving car in which passengers are thrust into a simultaneously public and private mode of transportation. The first situation is when a woman is already seated in the backseat of the vehicle and a man is faced with the dilemma of where to sit. The second situation is when a man is already seated in the backseat of the vehicle and the woman is faced with the dilemma of where to sit. These two scenarios allow a glimpse into how the seating politics in an intimate setting such as a car are sorted out, most often non-verbally, between passengers. In these situations, the driver acts as a neutral power, neither male nor female, due to their role as the moderator as discussed previously. In this context, “power” does not mean who is barking orders, nor does it insinuate a dictatorship of any kind; rather, for my purposes “power” is the ability to set the tone for the

environment and take over some of the social responsibilities that the driver, as the moderator of the space had prior to their obsolescence.

In a conversation with James, a man from Oregon who works on passenger related experiences with autonomous vehicles, he explained that over the course of his research he has ridden in a number of MSPs using the carpooling option. On the topic, he mentioned that,

“When the car pulls up and there is a driver and another passenger in the car, and that passenger is in the backseat and the passenger is a woman, there is an automatic feeling that I will sit up front with the driver, even if the driver is a woman. There’s a lot of gender expectations. You don’t want to come off as being threatening.”

There are a number of things going on in this recollection. To start, the power dynamic between the passenger who is already in the car and the passenger who is joining the ride is palpable and as James said, there is a gender dynamic as well. In this case, gender and social norms play a large part in the seating location that the second passenger will choose. Additionally, the feeling of not wanting to make the other passenger uncomfortable in this intimate environment is also on the forefront. The space that we give one another, especially in public environments or with people with whom we are unfamiliar is dictated entirely based upon the culture and politeness practices, however micro- or macrocosmic, of each individual.

While James might feel, based upon his own cultural background, that sharing the backseat with a passenger of the opposite gender might make them uncomfortable, that is not to say that everyone would feel the same. For example, Tripp, a male college student from Oregon explained, “I would always sit in the back regardless of the gender of the other passenger because I’m being driven. It’s a service and the car and its contents belong to a company or another person and I would just prefer to sit in the back unless the back was filled up and then I guess I would have to sit in the front.” Tripp offers another take on the intimate environment that is the inside of a vehicle. Due to his own experiences and culture, the fact that the ride is a service dictates where he sits more so than the gender or social expectations. While speaking

about the same scenario, Harrison, a male college student from Texas, explained his seating choice as follows:

“I would probably sit in the backseat but not in the middle. If she’s in the middle I would sit in the front seat. I think if there’s a driver I’m compelled to sit in the back. If it was just me and the driver and I wanted to talk I would sit in the front, but if someone else is in the car I would definitely sit in the back so that the person in the back doesn’t feel alone or weird.”

Harrison’s answer indicates a similar sentiment as Tripp’s, both men expressing disinterest in sitting beside the driver. While James was preoccupied with ensuring that the female passenger in the vehicle felt comfortable, Tripp and Harrison were focused on the service experience and the transactional quality of the ride. What is interesting, though, about Harrison’s response is that he indicates that he would be more inclined to sit up front with the driver if he wanted to talk during the ride. This is noteworthy because it illustrates the different social connotations of the seats within the car and the construction of what is expected from passengers who are sitting in one seat or another. The closing of the space between the driver and the passenger when the passenger sits beside the driver rather than behind the driver, for some cultural reason, indicates a desire or willingness to chat with the driver. With the unsaid and culturally constructed meanings of the different seats especially when trying to decide where to sit if there is already a passenger in the vehicle, it is clear from these three examples that the seating politics in an MSP vehicle are anything but clear cut. Further, this unknown illustrates an area where apprehension emerges due to the newness of the situation and the potential for a socially awkward experience.

These accounts, however, do not address how the woman would feel if a male passenger chose to sit in the front or the back seat when joining them on a ride. After all, the previous statements only account for how the individuals think the passenger of the opposite gender would feel. While speaking to Ivana about this she said, “I would honestly kind of think that it would be weird if he went into the front seat because it would almost be like he was avoiding me

in a way. Assuming I was the only one in the car other than the driver, I would assume he would sit on the opposite end of the back seat.” Ivana’s point of view illustrates an example of how the perception of a stranger’s reaction could differ entirely from their actual reaction. In this case, James’ desire to be polite and give the female passenger space could be perceived as rude or evasive. In a situation in which both individuals are uneasy about what the other one will think of their actions as they try to ensure a level of social politeness in a space that lacks social rules due to its newness, fear creeps in due to the high stakes of a social situation that the passengers will be stuck in until one of them reaches their destination. The stakes here are heightened with autonomous vehicles because the driver is no longer present to act as a diffuser in the situation.

Maria, a female college student from Illinois, when conversing about the same topic, explained,

“I would prefer that the man joining me sit in the front because then there is more of a distance and I feel like there is something separating us. I would be more comfortable having him come second because I have someone with me as opposed to going into a situation where I don’t know both people. Even though the driver is also a stranger there is more comradery between me and the driver.”

This exemplifies the paradox of behavioral and politeness ‘norms’ because the normal behavior is entirely situational and is dependent upon who you are sharing a ride with. Maria’s desire for the male passenger joining the ride to create social distance between them by sitting in the front is interesting because she could actually control this situation far more if she simply chose to sit in the front in the first place. If she had decided to sit in the front then she would not have to rely on the passenger joining the ride to read her non-verbal cues that she wanted them to sit in the front rather than joining her in the back. Maria’s response also brings up something that Harrison mentioned, that the seats in the car mean different things. Because she chose to sit in the back seat to begin with that could indicate to the driver that she was not interested in engaging in a conversation. However, had she chosen the front seat then she could have been non-verbally

inviting the driver to try to engage in more conversation with her when in fact she just wanted to ensure that she wasn't sitting beside another passenger when they joined the ride. This complex and nuanced social situation within an MSP illustrates a situation that could be further complicated when the driver is removed from the car by autonomous vehicle technology. This strained social situation when it comes to the gendered seating politics within the vehicle is a source of anxiety that is intensified with driverless MSPs.

Complicating things further, Carol, a mother of three from Oregon, reacted very differently to the same situation that Maria referenced.

“I always choose to be in the front passenger seat. If I was forced to sit in the back of a car with a man I would feel really uncomfortable. There's a console between the driver and me, so even though the driver is a stranger it somehow feels like there's more distance between us. I just think that the most powerful seat in the car other than the driver's seat is the passenger seat and I prefer sitting there.”

The power dynamic, as Carol interprets it, is based on where you sit, with the passenger seat outranking the backseat. This opinion is indicative of the different constructions and ideologies about power and control that can be assigned to spaces even as small as a four passenger car. This links to what Harrison was speaking about when he mentioned the constructed meanings of the different seats in a car. While Harrison focused on how sitting in the front seat with the driver presumably indicated a desire to socialize, Carol concentrated on the different constructed power dynamics of the seats and how the built aspects within the car i.e., the console, indicate a certain level of separation. What's more, Carol compared the seating situation to being on the plane, saying, “it's like being on a plane, on a plane you're just as close, but everyone is sitting close to a stranger so it's normal.” This same type of view is present in the case of public transportation. It is widely understood that a rider will be sharing the space with many other people who are likely all strangers. In this way, the space within planes and within other forms of public transportation is seen as public whereas the space within a car is seen as private. This is the root

of the complexity in MSPs, especially driverless MSPs, because it is a space that is widely considered private but that is being made public as a result of technology. This spatial shift might call for a simultaneous shift in the assumptions under which we function when it comes to passengering a driverless MSP, seeing the space not as private but as public and understanding that what comes with that public space is the potential for having to share it with a stranger. Carol's explanation also reveals a certain degree of uneasiness in the face of sharing such an intimate space with a stranger, specifically a male stranger. This apprehension is only magnified by driverless MSPs due to the absence of the driver because it leaves the sorting out of social etiquette entirely in the hands of passengers without the neutral presence that the driver offers.

At this point we have supposed that the existing passenger is a woman and that the passenger joining the trip is a man, but what if the roles were reversed? When posed with a scenario in which there is already a man in the vehicle and a woman is the second passenger to board the car, Maria responded,

“I would probably - I personally feel weird sitting in the front seat of a car that I'm paying for a ride in, so I would sit on the opposite side of the back seat but I would be more uncomfortable if he was already there because I feel like it would just be too close even though obviously it's the same distance you would be from the driver if you were in the front seat, it's more that there isn't that barricade I guess.”

The discomfort associated with proximity to another passenger and the fact that despite the “barricades” between Maria and the driver who is of equal distance from her if she were to sit in the front seat as the first passenger is from her if she were to sit in the backseat, she would still prefer to be in the back because of the transactional quality of the ride. Her response echoes what Tripp mentioned about their mutual preference to sit in the back due to the fact that they are paying for a ride. This illustrates the importance of the transactional quality and the way in which it rules the seating politics that the passengers must contend with.

Furthermore, Maria mentioned a sentiment that Carol brought up about the console and the idea of preferring a barricade of sorts between her and another person in the car, driver or passenger. The desire to separate oneself from another person and create a smaller space to inhabit that prohibits intrusion by anyone else in the car is curious and demonstrates the way in which the built environment within the car matters when it comes to partially diffusing a tense social situation. While the absence of the driver in an autonomous MSP might cause fear, it could also alleviate some pressure because the different connotations associated with the seats that both Harrison and Carol brought up previously could change considerably. While Maria definitely still describes a strained situation in a vehicle and reveals how that tension could be exacerbated by driverless MSPs, she also touches on how the lack of a driver and another person to contend with in such an intimate social situation could reduce some aspects of the social stress.

When posed with the same scenario, Ivana responded, “I would definitely sit in the back with the guy because in the front you have to make conversation with the person who is driving automatically and it’s awkward and in the back its less awkward because we’re both riding in someone else’s car and there isn’t the pressure to talk to each other.” Ivana’s notion that it would be impolite to not make small talk with the driver if she was in the front seat is an interesting social construct that harkens back to Harrison, Carol and Maria’s constructions of the connotations and responsibilities associated with each seat in the car. Ivana’s response emphasizes the different relationship that a passenger has with a driver and another passenger despite the fact that everyone in the scenario is a stranger to one another. Carol, when asked about whether she feels a pressure to make conversation when sitting in the front seat said, “I like conversation, I don’t think about it either way but I usually make conversation with drivers, it’s a nicety.” Both Ivana and Maria align more closely with Tripp’s desire to sit in the backseat with the first passenger than in the front. This differs from James and Carol’s response, both of

them preferring the front seat, Carol more so than James, but nonetheless sharing the sentiment that it is more socially appropriate. While these differences of opinion could be credited to their age, James and Carol are both a generation above Ivana, Maria, Harrison, and Tripp, and that fact itself offers an insight into the different ways that individuals use space and interpret social norms based not only on their gender but also their generation. These responses ultimately demonstrate the uneasiness regarding social interactions with strangers in intimate spaces such as cars. This commentary adds an essential social layer to the macro level public discourse and also illustrates the ways in which driverless technology will complicate an already elaborate set of cultural norms and behavioral standards within the car.

In response to this seating paradox, one might ask, if this couldn't all be remedied if the second passenger simply asked the first passenger where they would prefer them to sit. When asked this question Ivana and Maria both responded with a resounding "no". Specifically, Ivana said, "I would think it was very odd because it puts me in some weird position of power that could just make the dynamic weird." Similarly, Maria said, "That would be so weird! I feel like even though I definitely have a preference for where I would want the second passenger to sit I still don't want to force them to do anything that could then make them uncomfortable, I guess I would rather be the slightly uncomfortable one in a situation than force another person to maybe be uncomfortable." Both women preferred the seating arrangements be chosen without the exchange of words primarily because they worried that it would establish an awkward power dynamic in which they were somehow forced into the position of power. In this way, the second passenger asking where the first would prefer them to sit is a face threatening act that, according to Maria and Ivana, would be very socially unacceptable and would largely make what is already a sensitive social situation worse.

Ivana's response introduces a power dynamic, and while she asserted that she would rather that the power dynamic not exist based on the second passenger asking where the first

passenger prefer they sit, that dynamic is, in fact, still very much present even without the exchange of words. In some ways, the first passenger has the most power between the two. It cannot, however, be assumed that the first passenger had their pick of the seats, because in the relay of carpooling using MSPs, they could have been the second passenger in a similar scenario previous to the scenario that we are addressing here. In this way, the power is often handed off from passenger to passenger as the ride progresses and is complicated as more passengers are added before some reach their destination. This constantly fluctuating landscape of power is unique to this new kind of public transportation due to the isolated private intimacy found within the vehicle juxtaposed to the crowded public intimacy experienced in a bus or train. This continual change causes trepidation and uneasiness because of the constant requirement that the passengers assess the social dynamic within the vehicle and is further amplified when the driver is taken out of the equation because of autonomous technology.

Maria's response similarly introduced a power dynamic, however, it is a different type of power. She explained that she would rather be the one who is slightly uncomfortable than impose her preference on another person due to the potential for them to feel uncomfortable with her assignment of their seat. The idea that the second passenger should not shoulder the burden of discomfort, and that the first passenger should take it on instead, presents the power dynamic between the passengers on its head. In this case, the second passenger, despite the limited seats from which they can choose and despite the fact that they are new to the space, has the upper hand due to the first passenger's unwillingness to burden the potential discomfort of assigning a seat. Just as with Ivana's response, this version of the power dynamic is intensified in the case of a driverless MSP because while these reactions have not mentioned the driver directly their presence is an important facet of the social dynamics within the vehicle because they act as a neutral actor, there to diffuse what could be a tense situation.

Antithetically, Carol responded to the very same question with an enthusiastic, “Yes!” Saying, “If I was in the backseat for whatever reason even though I prefer the front, and if the front seat was empty, I would think that it would be incredibly gracious if a man asked where I prefer he sit. But maybe he would say “do you mind if I sit here?” That would be incredibly kind.” From Carol’s perspective she is focused not on the power dynamic that would be created, but rather the politeness with which the stranger approached the situation. If the response to the second passenger asking where the first passenger would prefer them to sit isn’t polar enough, when I asked Harrison what his response would be, he explained, “I think it would be kind of odd but I would tell her that I don’t mind and that she can sit anywhere. It would be odd because it’s not really up to me, we’re both sharing the service, so we’re equal - my preference doesn’t hold any weight.” The widely varying responses to the same question illustrate the various situational differences that could potentially come from gender, age, past experience, culture, and an infinite amount of other factors, that would all lead to a ride that falls somewhere along the spectrum of uncomfortable to comfortable. These responses also illustrate the uneasiness with which people approach such a novel social situation, a feeling that is only magnified and complicated by autonomous vehicle technology and the lack of the driver as someone who could potentially absorb the tension. Moreover, this line of inquiry brings to light the weighty social aspects of vehicles and adds an invaluable layer to the macro-level popular discourse about autonomous vehicles.

Conclusion

The constant fluctuation of power dynamic between passengers in a self-driving MSP and the flow of people in and out of the vehicle will be an interesting site to look at as people begin to examine the complex issues that are taking place in this new and intimate, yet public, social

situation. In every group of people each individual has a certain type and amount of power and the social situations within a self-driving MSP will likely be no different. One can only hypothesize whether the power will fall on the first passenger due to the fact that they are already established; on a certain gender, whether it is the male or the female; based on seniority; or based on some other factor yet to be seen due to the newness of the technology itself. The space within the self-driving MSP vehicle is a valuable site of study due to the existing and largely conflicting ideologies and constructions of what should happen in the space. Unlike public transportation as it exists, the space is private and isolated. Unlike taxis or MSPs as they exist, the space will not have a driver to moderate the space and diffuse social tensions in the isolated intimate space.

With the obsolescence of the driver will come a new kind of sociocultural landscape in which the passengers will have to quickly sort out the basic power dynamic in the situation, and while the dynamic will be temporary and exist only in the confines of the space within the vehicle for the duration of the trip, it will most definitely be communicated, whether through body language or verbally. Whether these relationships will be pushed one way or another by signage such as that which exists in public busses, subways, or trains is yet to be seen; however, it is likely that in the early days of the technology the simple thrill of the ride might very well cloud the eventual need for established social and behavioral norms. This line of inquiry brings to light a crucial layer to the already existing popular discourse regarding self-driving cars because it illustrates the social aspects of cars and a the more nuanced macro-level discourse about the space within the car. Furthermore, it offers unique insight into the fears that people have about the social relationships that are constructed in the car, for however fleeting a ride, and the worries about the difficult social landscape that the passengers will be required to navigate together.

Conclusion

The effects that new technologies have historically had on society have resulted in immeasurable consequences that ripple through multiple aspects of our lives. Arguably, one of the most impactful technologies on modern life was the automobile. This singular technology revolutionized not only how and where we live but also how we interact with the world around us. It has opened up frontiers and possibilities. It acts as a symbol of modern society and allows a certain kind of freedom, the freedom of the road and the seemingly endless possibilities therein. Simultaneously, though, the automobile has taken lives; it has had a hand in the destruction of ecosystems as a result of the expansion of cities; it has contributed to climate change through the entire life-cycle of the car, from manufacturing, to driving, to retirement; and countless other irrefutably negative side effects. The automobile began its journey as an incredible innovation, and while the positive consequences are undeniable, the far-reaching detriment that this single technology has caused are also incontrovertible. We are currently on the brink of yet another revolution in automobile technology: the autonomous car. This technology is exciting and has the potential to revolutionize our transportation repertoire as the automobile itself did in its beginnings. This research is crucial and timely because it articulates the current transformation of the conditions of driving, the car, and the act of driving as well as the future projections of those aspects of the car. This thesis is not about the automobile or autonomous vehicles as commodities, but rather as culturally imbued artifacts embedded in our lives. The deeply complex and intricate nature of the automobile as it exists is necessary to fully understand the nuanced ways in which driverless car technology will fundamentally alter the cultural landscape in the United States.

This thesis dealt with the existing macro-level public discourse regarding self-driving cars and the facets that emerged as important issues regarding autonomous vehicles as portrayed

by the media. These polemic debates about the consequences, however, did not regard the elaborate ways in which the automobile is embedded in our everyday lives. Autonomous vehicle technology offers a momentary window through which we are able to estrange the vehicle despite its embeddedness in our lives. Through this window we are able to see the messy relationships that people have with their cars. This technology, after all, is not simply changing the way that we drive or whether we drive or not, rather, it is fundamentally changing the way in which we live our lives and the infrastructure of our lives. The public discourse aptly illustrates the far-reaching aspects of the vehicle and reinforces the automobile's deep ties to a ideologies about national identity, however, these discourses assume that the car is simply a commodity rather than an artifact of our culture. It is this view, the view of the automobile as a cultural entity that I argue is most important when it comes to the study of a technology and the ways in which it can and will alter the way that we engage with transportation.

To establish the automobile as an object with profound cultural meaning it is necessary to unpack the elaborate narratives that individuals have with their cars. For, we cannot consider the automobile as simply a tool or a commodity because this leaves out the social relationships that individuals project on their vehicles. These relationships add invaluable layers to the macro-level discourse and reveal fears about autonomous vehicles and the ways in which the technology could alter or abolish aspects of these important connections. This view of the automobiles begs the question of whether or not this techno-fix solves the current transportation problems plaguing this country. Perhaps, fixing this current issue of automobile culture isn't about technological inventions, perhaps it's about changing the relationships that individuals have with public transportation rather than modifying the relationships that they have with their automobiles.

Further complicating and adding yet another layer to the macro-level public discourse about autonomous vehicles is the importance of the space within the car and the ways in which that environment is imbued with cultural significance. While some aspects of this technological

innovation elicit excitement at the idea of being able to relinquish the tiresome task of driving in favor of engaging with those with whom the car is shared, other features emerge as problematic effects of the technology, including the loss of interpersonal time with children on the way to and from school and the issue of gender and the seating politics within the social space of a shared MSP. In these ways, the obsolescence of the driver results in a complicated and very unique social atmosphere for which there are no cultural or behavioral norms. The environment within the car is an interesting space because as it exists it is incredibly intimate. The close proximity that passengers and drivers are placed in makes the interior of the car a particularly interesting cultural landscape. The interior of the car stands to undergo a radical shift with the introduction of driverless MSPs. That shift will be, according to projections, a movement from the private to the public sphere as MSPs begin to offer ridesharing services that match strangers together in the intimate space within the car. The fears associated with this technology in the context of the social and cultural landscape within the vehicle are magnified by the notion of a private space converting into a public space and the complex intimate environment that follows this change. Ultimately, this, too, adds a detailed social layer to the macro-level discourse that is enabled by the ability for a technological shift to estrange a cultural artifact that is routinely overlooked as a result of its ubiquity and the seeming inherent nature of its existence.

This research is a timely and crucial supplement to the existing popular discourse apropos autonomous vehicle technology. Through in-depth interviews I reveal the symbolic and material function of cars. These layers are significant because the car is more than its transportation ability, rather, the car is comprised of the cultural connotations and denotations and the multitude of meanings attached to it. Too often we see technology as a fix and in the case of autonomous vehicles that fix is simply taking people out of the driver's seat. This, however, does not address the fundamental issues that vehicles pose and could actually be harmful. While it is not my goal to undermine the idea that technology can be a solution to many serious problems that face

society, I hope that my research prompts more critical reading and analysis of technological advances which can then lead to the formation of well-rounded opinions with regard to technology as a panacea. The reliance on private technology to solve problems of accessibility and environmental damage is erroneous because these developments don't necessarily solve them, and if they do there are countless paradoxical and antithetical consequences that arise. While driverless technology poses an intriguing and futuristic alternative to current methods of transportation, perhaps the solution to our nation's mobility issues is to develop better transit systems and plan better infrastructure. Perhaps we have to rethink everything rather than making a small gesture by way of installing computers into cars and giving them the ability to drive themselves. Perhaps there is, in fact, no small gesture that can solve any of this or make any of this disappear, because applying technology to problems has the potential to exacerbate issues in a multitude of unpredictable and unprecedented ways and can cause ripple effects that have dire consequences. Because of this, I implore those who are interested in this mode of inquiry to demystify the automobile, to disrupt and question the individual car in the face of innovation, and to delve into the importance of the car as a cultural artifact and as a space that people inhabit and imbue with meaning.

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