Having both hands on the steering wheel: Driving behaviour of white-collar workers with degenerative eye conditions

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ABSTRACT

Because people in the United States are highly reliant on cars for transportation, individuals with restricted driving abilities face severe accessibility constraints in the labour market. Guided by the social exclusion framework, we used a qualitative approach to gain insights into the role of car driving and alternative commute modes in the lives of white-collar workers with degenerative eye conditions. The study participants gradually restricted their driving behaviour as the disease progressed. They also exhibited several types of commute solutions, which lent themselves to a variation in the experienced degree of exclusion (both between participants and within participants over time), with changes in vision state and available resources. Another aim of our study was to identify the motivations for driving behaviour. The results showed that while a desire to reduce the risk of an accident motivated the participants to stop driving, certain normative (for men) and practical considerations motivated participants to continue driving. While all of the participants eventually stopped driving due to vision decline, the decision to quit often occurred only after the participants experienced one or more car accidents. Workplace accessibility is a factor that hinders labour market participation of individuals with degenerative eye conditions and encourages individuals to engage in risky behaviour.

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1. Introduction

The most popular mode of commuting in the United States is driving (McKenzie & Rapino, 2011). This is hardly surprising given the long-standing urban development and planning practices in the U.S., in which driving has long been given priority over walking and access to public transport (e.g., Handy, Cao, & Mokhtarian, 2005). Furthermore, in the U.S. and across western societies, acquiring a driver's license and driving a car are prominent cultural identifiers of maturity, autonomy, and independence; of masculinity (for men); and of citizenship and sociability (Carrabine & Longhurst, 2002; Sheller, 2004; Urry, 2007). In addition to these cultural markers, being able to drive also plays a role in obtaining and sustaining employment. As physical mobility is an important determinant of social mobility (Kaufmann, Bergman, & Joye, 2004), it is evident that individuals who do not drive have lower chances of finding employment (Grengs, 2010). Indeed, not driving

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can detrimentally influence a person's chances of employment, regardless of whether a vehicle is needed to perform job-related tasks (Baum, 2009). Not driving thus hampers the ability of individuals from disadvantaged groups, including individuals with disabilities, to integrate into and fully participate in the labour market. Being shut out of the labour market can, in turn, lead to social exclusion (e.g., Farber & Páez, 2010; Preston & Rajé, 2007). In this paper, we define social exclusion as being completely or partially unable to participate in the labour market, and in social activities that are available to the majority of the population, due to restrictions in resources and in access to services and rights. Social exclusion is further considered as an accumulative interaction between social problems that occur simultaneously or in sequence (Lucas, 2012). For instance, having a disability may lead to reduced access to transportation, which in turn leads to difficulties in participating in the labour market.

A particularly salient group to consider when examining the role of car driving in social exclusion is white-collar workers with degenerative eye conditions. This group is important for three reasons. First, to our knowledge there are no previous studies that have investigated the topic of driving among white-collar workers with degenerative eye conditions. The existing studies that have investigated the role of commuting in the work context have not distinguished between the type of disability and the type of work (Farber & Páez, 2010). Thus, these studies have not specifically examined the experiences of individuals with degenerative eye conditions who compete at higher levels of the labour market (i.e., white-collar workers), and who are at risk of exclusion from participation in society, including in the workforce. The existing research has, however, shown that, while there are alternatives to driving as a means of commuting to work (e.g. walking, public transportation), individuals with severe visual impairments—much like the general population in the U.S. (Giuliano & Dargay, 2006)—have a preference for using a private vehicle, either as a driver or a passenger. This is evident from the relatively high numbers of individuals with severe visual impairments who avoid using public transportation by getting rides from others (Gallagher, Hart, O'Brien, Stevenson, & Jackson, 2011; Golledge, Marston, & Costanzo, 1997). The preference for driving is also apparent in the substantial number of drivers with severe visual impairments who are impaired in their ability to drive (Szlyk, Taglia, Paliga, Edward, & Wilensky, 2002), but who continue to drive despite the increased risk. This is alarming, because individuals with a severe vision impairment who drive run a much greater risk than the general public of getting into an automobile accident (Ivers, Mitchell, & Cumming, 1999; Szlyk et al., 2002; Wang, Kosinski, Schwartzberg, & Shanklin, 2003; Wood, 2002). This problem may be partly attributable to inadequate regulation of the vision tests for driver's licenses in the U.S. (Fishbaugh, 1995). It can also be difficult to restrict or prohibit driving by people who have visual impairments, especially as many of these individuals have incentives to conceal their condition. In the workplace, individuals with visual impairments often assume that both practical aspects of their limitations and the stigma attached to their identity will decrease their chances of obtaining and sustaining employment (Spiegel, De Bel, & Steverink, 2016). However, the question of which factors encourage or discourage driving among people with visual impairments remains open.

Second, studying this group provides us with a unique opportunity to gain insights into the various facets of social exclusion related to vision decline, because the lack of optimal tools and solutions likely influences the car driving and transportation choices of these individuals. A core premise of the social exclusion approach is that the lack of *access* to opportunities (i.e., the inability to commute) is what generates exclusion, rather than the absence of opportunities (Preston & Rajé, 2007). Access to places of employment and services is determined by the mobility landscape. For example, how far do people have to travel to reach their workplace or other desired location? Is public transportation available, and are sidewalks safe for walking? Mobility constraints limit the ability of individuals to actively participate and to access certain commodities (i.e., without work, the individual does not have access to goods). Whereas there are technological solutions that enable some other disability groups (such as those with limb disabilities) who would not otherwise be able to operate a car to engage in conventional driving, there are currently no such tools available to people with visual impairments. Alternatives to car driving can be costly (taxi, private driver), time consuming (public transportation), or burdensome for others (receiving rides) (Golledge et al., 1997). Additionally, relocation to cities where walking is a feasible commute solution is still considered a challenging solution for individuals with severe vision impairment (Worth, 2013).

Third, Schwanen et al. (2015) have suggested that there is an important gap in the literature on social exclusion, as the social exclusion framework used in most of these studies refers to social exclusion as a dichotomous state. The authors argued that while it is often assumed that a person is in a state of either inclusion or exclusion, in practice social exclusion takes place on a gradient. Individuals with degenerative eye conditions are of particular interest in this context, as they not only exist on the continuum between inclusion and exclusion, they also move between the two ends of the continuum over time as their vision declines and their available resources change (e.g., being able to afford taxi rides). Yet, so far it is not known what shape these processes take and how the individual experiences them.

Based on the above considerations, two questions will be addressed in this study: *How do white-collar workers with degenerative eye conditions experience and deal with changes in their perceived abilities and available resources in choosing between car use and alternatives over time? And how do these individuals motivate the choice to stop or to continue driving?*

In this study, we use a qualitative approach that enables us to gain insight into the experiences people with degenerative eye conditions have with commuting to work by car and by other modes of transportation, and to identify overarching themes across the narratives of these individuals. This approach also allows us to gain a better understanding of the gradient and the shift over time in the behaviours and the experiences of these individuals, and to relate these trajectories to issues of social exclusion. These findings may ultimately contribute to the development of more focused legal and societal interventions that discourage high-risk behaviour (i.e., driving) among visually impaired individuals, and that minimise the extent to which they are excluded from accessing the modes of transportation they need to commute to work.

2. Methods

2.1. Ethical statement

This study implemented guidelines for ethical conduct in qualitative research in the social sciences (Hennink, Hutter, & Bailey, 2010), in line with the Declaration of Helsinki. The ethical committee of the sociology department of the University of Groningen has confirmed that the study has been carried out in an ethical manner. Consent for participation was received from all of the study participants in two ways; first the consent was recorded on tape before the beginning of the interview and in written form thereafter. Second, the participants received a consent form to fill out after the interview. The participants were encouraged to consult the consent form at the time of their convenience (with the help of others if needed). All of the names and other identifying information have been anonymized.

2.2. Sample

We approached participants through a medical research non-profit organization based in the United States. We sent out participation letter requests to individuals who met the following criteria: the participants had to be at least 40 years old, to have had a degenerative eye condition for at least 10 years, and to have been employed either at the onset of the disease or while the disease was progressing. All of the participants were employed in white-collar positions, and had been diagnosed with either (types of) Retinitis Pigmentosa or Stargardts.

The first author of this paper conducted all of the interviews. The number of participants was determined using the principle of information saturation (Hennink et al., 2010). Information saturation is a sampling method that posits that the sample size should be established as the researcher is collecting the data. After each additional interview the researcher examines the input given by the participants on the topic in question, and evaluates whether new information is being introduced. When additional interviews no longer generate new insights, the researcher ceases collecting data. Thirty-six interviews were conducted with the original sample. Four of these participants were removed from the sample for various reasons: two of the participants who suffer from dual sensory loss (also hearing) experienced emotional difficulties with completing the interview, a third interviewee was eliminated because he was not yet experiencing any significant vision loss, and a fourth participant was removed because he was unable to communicate about the topic at hand due to a language barrier. We further recruited four participants through a snowballing procedure. The interviewer stopped recruiting participants when no new insights were provided by additional interviews. Thus, the total number of interviews used in this study is 36.

The majority of the participants were highly educated, and defined their socioeconomic status as middle class or higher. While ten participants were not working at the time of the interview (unemployed or retired), all of participants had been previously employed in a white-collar position. The general demographic information can be found in Table 1.

2.3. Data collection

The data used in this article are taken from a project that investigates the challenges and achievements that characterise the work lives of white-collar workers with degenerative eye conditions. The life stories of the participants were collected as part of a grounded theory approach. Grounded theory is a systematic methodology that mainly involves inductive data collection. Rather than test specific hypotheses, this method allows the data to shed light on the research problem (Hennink et al., 2010). This approach is appropriate for the investigation of the current research questions, because before starting this study we knew too little about the challenges white-collar workers with degenerative eye conditions face in the workplace to formulate hypotheses.

Participants were asked to tell their life story, with an emphasis on the role their visual condition has played in their work trajectory. Otherwise, they were given free rein in telling their story. Deductive methods were also used, but to a lesser degree, as recent studies on grounded theory suggest that research is not done in a vacuum, and that the principles in the literature are always implicitly and explicitly present throughout the research cycle (Heath & Cowley, 2004). For this reason, a set of themes (see Table 2) based on broader research on vision impairment has been used as an additional guideline. Participants were asked about these topics directly only if they did not mention them in their narratives.

Twenty-four interviews were conducted face-to-face, while the rest were done by phone. The interviews took an average of 50 min. The duration and the richness of the interviews did not vary significantly based on the method of data collection.

2.4. Data analysis

All of the interviews were fully transcribed. The first author and an additional coder then coded all of the interviews in ATLAS.ti inductively and independently, using the guidelines from Hennink et al. (2010). The authors worked independently to reduce the potential bias stemming from the fact that the first author is visually impaired. After each of the four additional interviews were coded, the two coders met to determine which of the codes that emerged in the data were most important. These codes were then formed into categories using the following steps. First, similar codes were identified and grouped

Table 1
Descriptive information about participants.

Pseudo name	Employment status	Relationship status	Socio-economic class	Age	Age of diagnosis	Type of living area	Interview properties
Susan	Retired (worked FT)	Second marriage	Middle	66	37	Urban	In person, original pool
Eleanor	Retired (worked FT)	Married	Middle	59	19	Suburb	In person, original pool
Emily	Retired (worked FT)	Second marriage	Middle	59	20's	Urban	In person, original pool
Michael	Retired (worked FT)	Married	Upper	60	43	Mid size town	In person, original pool
Greg	Unemployed (worked FT)	Married	Middle	59	25	Urban	In person, original pool
Kim	Retired (worked FT)	Divorced	Middle	55	41	Mid size town	Phone, snowball
Josh	FT	Married	Upper-middle	53	15	Suburb	In person, original pool
Rick	PT	Second marriage	Middle	54	27	Suburb	In person, original pool
Oliver	FT	Married	Middle-upper middle	54	18 (struggle earlier)	Suburb	Phone, original pool
Joey	FT	Married	Middle-upper	42	19	Urban	Phone, original pool
Noah	FT	Married	Upper	82	26	Mid size town	Phone, original pool
Lauren	Retired (worked FT)	Second marriage	Upper middle	73	40 (struggle earlier)	Urban	In person, original pool
Patrick	FT	Married	Upper	68	18	Urban	Phone, original pool
Dylan	FT	Divorced	Upper middle	53	37	Urban	Phone, original pool
Debra	FT	Single	Upper middle	55	33	Urban	In person, original pool
Dan	FT	Married	Upper	50	13	Suburb	In person, original pool
Henry	FT	Married	Upper	67	22	Suburb	In person, original pool
Nick	PT	Married	Upper middle	59	18	Urban	In person, original pool
Phil	Retired (worked FT)	Second marriage	Upper middle/upper	82	27	Urban	In person, original pool
Dick	FT	Divorced	Middle	42	27 (struggle earlier)	Urban	In person, original pool
Roger	FT	Married	Upper middle	52	42	Urban	Phone, snowball
Ron	FT	Third marriage	Upper	60	17	Suburb	In person, original pool
Adam	FT	Married	Upper	73	39	Suburb	In person, original pool
Benjamin	FT	Divorced	Middle	52	5	Urban	In person, original pool
James	FT	Married	Upper	70	5	Suburb	Phone, snowball
Rachel	Unemployed (worked FT)	Married	Middle	52	31	Urban	Phone, snowball
Justin	FT	Married	Upper middle	67	20's (struggle earlier)	Suburb	Phone, original pool
Norah	FT	Second divorce	Upper middle	53	21	Mid size town	In person, original pool
Gabrielle	PT	Married	Middle	45	26	Urban	In person, original pool
Michelle	FT	Cohabiting	Middle	51	38	Urban	In person, original pool
Carol	Unemployed (worked FT)	Second marriage	Upper middle	50	30	Suburb	In person, original pool
Gwen	PT	Married	Middle	63	Mid 40's	Suburb	In person, original pool
Sarah	PT	Divorced	Lower	58	37	Suburb	Phone, original pool
Katy	PT	Married	Upper	56	23	Suburb	In person, original pool
Jill	FT	Married	Lower middle	70	17	Suburb	Phone, original pool
Monica	FT	Married	Upper	77	18	Urban	In person, original pool

Full-time = FT. Part-time = PT.

Table 2
Pre-established discussion topics that have been covered during interviews.

Themes	General description
Background	Experience growing up with eye condition
Eye condition	Information in disease, coping strategies
Work life choices	General career description. Career in light of eye condition
Identity	Self-acceptance, identity as visually impaired
Social surrounding	Social support from surrounding (private and work), contact with peers with visual impairment
Demographic information	E.g., household composition, educational background, mobility training, etc.

together inductively into broad categories, and were given a descriptive name. Then, based on the particular research questions at hand, the broad categories were broken down into smaller, more meaningful groups of codes. Each category then was made to represent a concept, which was then used in the formulation of a joint "family code book". These family codes, which were used in the next steps of this analysis, are presented in Table 3.

To answer our research questions, we made use of the "bigger picture" approach (Hennink et al., 2010). This approach stipulates that the researcher should identify the central story that accounts for the issues in the data (in this case, issues concerning the relationship between labour market participation and driving and commuting), while making use of the family code book. The researcher is then expected to step back from the data and look at the precise accounts of each individual, and at how these individual accounts are linked to each other in the context of the topic at hand (i.e., driving and commuting). Comparing the main overarching themes (from the family code book on the topic of commuting and driving) with the individual accounts (and the variations therein) allowed us to identify behavioural patterns among participants and their overarching motivations. These will be elaborated on in the next section.

3. Results

The topic of commuting by car consistently emerged as relevant in the context of work. While no direct questions about commuting were asked, all of the participants mentioned the challenges they faced in work related commute. As the participants brought up the topic of driving and commuting spontaneously, we only have information on the events they chose to report. We use quotes to illustrate that commuting, and the challenges associated with commuting, were meaningful to the participants. It is, however, likely that the respondents would have addressed these issues in greater detail if direct questions about driving had been asked. For example, they may have reported more car accidents.

3.1. Changes in car use over time and alternatives used by participants

Of the 36 participants, 28 reported that their initial main commute mode was driving. Some of the participants acknowledged, however, that their decision to continue driving was problematic:

'... I was still driving but not completely legally. I mean I probably shouldn't have, but I was still able to memorise enough stuff to get my license, but I probably shouldn't have been driving'. (Lauren)

The more vision decline participants experienced, the more concessions they made in their driving patterns. For example, some participants said they were driving only in the daytime or in familiar areas. However, most of the participants indicated that they preferred driving to work, even under restricted conditions, to using alternative modes of transportation. This was the case even when the participants were within walking distance of their workplace and other amenities, as in the following case:

'When I was 59 and I saw the visual field that I had was less than 10 degrees I gave up driving. Before that I had given up driving maybe full time two years before that where I was not driving at night and then it moved up to not driving at night and only driving to the gym and the diner. Both back roads both within five minutes of my house.' (Michael)

Table 3
Main code families used in this study.

Family code category	Concept
Driving general commute challenges	All codes describing commute related challenges participants experience
Driving and work	All codes describing commute related challenges participants experience in relation to their work lives
Commute strategies	All codes describing the various commute strategies and commute modes used by participants
Driving motivations (to continue and to stop)	All codes describing reports of participants motivations behind driving behaviour
Commute risk behaviour	All codes describing risky driving behaviour reported by participants

Table 4
Process of driving and commute behaviour.

Pattern description	Total	Male	Female
1 Drive → stop working	5	1	4
2 Drive → get rides	14	10	4
3 Drive → relocate & walk, walk or public transport	9	4	5
4 Never used a car for work commute	8	5	3
Total	36	20	16

After the participants decided that they were no longer able to drive themselves to work, their commute mode shifted according to one of four main patterns (see Table 4).

Four women and one man exhibited the first pattern. These individuals reported having considerable difficulties in fulfilling their work obligations without being able to drive. For these participants, not being able to drive meant that they were not pulling their weight at work. One participant in particular indicated she needed to drive several times a day to see clients. She recounted what happened after she asked for adjustments in her duties to accommodate her vision loss:

'At age 50 things started to turn a bit in my job at a school for developmentally disabled students. I was a case manager for supportive climate, which involved driving all day to different locations. So they kind of tailored that a little bit, but then it just got to be too difficult and it was time to hang up the keys'. (Eleanor)

These participants left the labour market when they were no longer able to drive, as is evident from the following case:

'Well there were a bunch of different factors [influencing my decision to leave my job] . . . You have to go to so many potential clients and have several meeting with each one before you can bring in the real clients. So when I could no longer drive that shrunk my ability to bring in new clients the way I was doing. That would have a negative, a severe negative effect on my compensation'. (Kim)

Ten men and four women exhibited the second pattern. These individuals replaced driving with getting rides from others (either paid or unpaid). This pattern was much more common among men than among women, as more men had the resources to organise rides. For example, men were more likely than women to have had a partner who was working part time or was a homemaker and was able to provide rides, or to have had a highly compensated position that made it easier for them to afford to pay for rides.

Some participants took their access to rides into account when choosing their place of residence, as is illustrated by the following testimony:

'From the beginning my wife and I planned, wherever we moved, we planned for transportation alternatives. When I moved to my second home from our first apartment it was right near my parents so we had a backup there. I had not only my wife driving but also my mother and father driving. Hence I had mobility'. (Henry)

Getting rides was perceived as challenging by only a few of the participants. One of the participants who reported having difficulties was a woman who was getting rides from her working husband, who also had a busy work schedule:

'So I had to work my schedule so that it was within the realm of his [her spouse's] work schedule. He is recently retired so now it's not as big of an issue. But for a lot of time it was an issue because I had to go to work when he could drop me at work. So maybe I started working at 8 o'clock but I might have to be at work at like 6.30 in the morning so that he could get to work on time (laughs)'. (Gwen)

However, most of the individuals who said they used this commute mode did not indicate that they had great difficulties, as most said they were able to participate rather easily in the labour market.

Four men and five women have exhibited pattern three. These individuals had replaced driving as their main commute mode with either walking or using public transportation. Some of these individuals made the conscious choice to move to an area where they could more easily walk or use public transportation as their main means of getting to work (e.g., from the suburbs to the city), as in this case:

'You know I have been a lot of places but this community [name], it's perfect. I can walk to at least eight restaurants and the bank, and the hospital, and my doctor and the grocery store, and the pharmacy and a couple little stores . . . I take cabs. I walk to work. I'm a mile from work'. (Norah)

Relocating to a more accessible area was not, however, a solution that was available to all of the participants. Moving closer to work can be expensive, especially as in many areas in the United States there is little or no public transportation or pedestrian infrastructure.

The participants who were working in bigger cities and relocated seem to have had an easier time maintaining their employment status. Others, like this individual, had to move their business to a different location:

'So I got through that I am back home trying to practice law by myself out of my home. That was a monstrous thing for me. I couldn't stand being around the home so I owned the building where my old law firm was and it was only half a mile away from my home so I opened up my own office in August of 2006'. (Oliver)

Having control over the location of his work gave this participant more independence and the ability to use his time more efficiently (rather than spending it commuting).

The final pattern consisted of five men and three women who never drove themselves, and who have always relied on a combination of rides from others, walking, and public transportation to get to work. It is important to note that only three of the participants reported making use of government-arranged rides (such as Para-Transit). When talking about their labour market concerns, most of the participants focused less on their commute than on other challenges, such as having limited access to information because of problems they encountered in using assistive technology.

3.2. Motivations behind continuing and stopping driving

While all of the participants eventually either stopped working or substituted driving to work with alternative commuting modes, the majority of participants reported that their decision to stop or to limit their driving was motivated to a great extent by repeated assessments of risk (see Table 5).

They assessed their ability to drive and the potential risk involved by comparing their driving skills to those of others, and by experiencing high-risk driving situations. Participants also relied on others to help them with the decision to stop driving (health professionals or individuals in their close network):

'I basically made the decision that, you know, if [the doctor] told me I was legally blind that I wouldn't drive anymore ... I think morally it was the right decision. And I feel that, you know, there are times I wish I could still drive and then there are other times when you're riding around and some other drivers are crazy. Then I think maybe it isn't such a bad thing that you can't drive anymore'. (Gwen)

The participants who reported postponing giving up driving despite their declining vision cited two main motivations for the delay. First, for many individuals, not being able to drive imposed practical limitations on their ability to work, such as on their ability to complete their work tasks or to commute to the office within a reasonable amount of time. The main alternatives to driving, public transportation and walking, were not feasible for many participants (especially for those individuals who lived outside of large cities). Participants often lived too far away from their workplace to walk and/or had poor access to public transportation. Additionally, many of the participants noted that public transportation in the United States is inadequate in a number of ways (e.g., it is not available, it is inefficient, or using it is time consuming). Thus, relying on public transportation to get to work was not an option for many of the participants:

'I couldn't get to the [workplace] without driving. so that's why I had to leave that. They held the job for me for a few months so I can figure it all out but probably around November, that's when we decided that there was just no way that I could keep getting back and forth to the airport at the hours that they needed me. It would take me hours. I would have to take a bus to another bus and then walk a mile'. (Rachel)

The example above illustrates how the inability to drive is perceived as a threat to an individual's ability to participate in the labour market. This dynamic therefore represents a means of social exclusion from participation in the labour market.

The second motivation the participants cited for continuing to drive was the fear of social exclusion based on the inability of the individual to fulfil normative expectations associated with driving. Only male participants (five drivers and two non-drivers) reported experiencing acute difficulties related to the symbolic meaning of driving, i.e., that no longer being able to drive affected their ability to be a full participant in society. The following participant reported that he felt that, if he could no longer drive, he was not fulfilling his role as the head of his household:

'I did stupid things like ... I only lived about a half mile from [work] but when I was driving at this time a year when the days get shorter I would follow my [work] partner, follow his headlights home, he would drive by my home and I would turn into my

Table 5
Motivations behind driving behaviour.

Driving motivations	Description	Total	Male	Female
Prolonging driving	Concerns that urge participants to continue driving			
Independence & access	The fear of being limited and unable to participate	19	8	11
Normative	A fear of losing an identity associated with driving (being able-bodied, masculinity)	5	5	0
Stopping driving	Concerns that lead participants to stop driving			
Reduced vision and anticipated danger	The anticipation that accidents may follow in the future	19	10	9
Accidents near accidents	Experiencing or nearly experiencing accidents	9	5	4

Results are based on reports. Not all participants revealed all concerns for driving or stopping with driving and the associated information (such as driving accidents).

> *driveway. So here you have two lawyers: one guy who can barely see and the other guy leading with two cars down the road. How ridiculously stupid was that? But it kind of underscores how [...] fearful you can be with this. Cause I'm the breadwinner in my family and I have all these people depending on me for going to school and putting food on the table; and I don't know, you just do things that you look back and go, "Wow, I can't believe I did that"'. (Oliver)*

This quote illustrates that for some participants being able to drive a car is associated with the ability to fulfil societal roles. After this participant realised that the risk was too high, he stopped driving and started working from home. And once it became clear that his decision to give up driving would not affect his ability to fulfil his role as a breadwinner, his original resistance to the idea abated. He explained how his attitude towards driving changed:

> *'I thought the world was going to come to an end when I stopped driving but it didn't. I even said to somebody the other day that, with all the stem cells and all the other research even if I get to the point some day that I can see the faces of my grandkids that ... I don't care if I ever drive again I can deal with that.' (Oliver)*

This case illustrates well that, even though this individual did not need to drive to commute to work (i.e., the practical dimensions of exclusion were absent), he was tempted to continue driving because he associated driving with masculinity and with being a breadwinner.

Other participants reported that they were uncomfortable with relying on other people for rides, even through a paid car service or cab. For example, the participant quoted below, who stopped driving because he lost all of his usable vision, expressed discomfort with his dependent status:

> *'I feel it's very important to pay the people who drive me very, very well even though they say, "No, it's all taken care of" ... but I still want to pay them just as though I have a private chauffeur; so that's the way that I feel more comfortable with it. I do pay them. But that is what I would say is the biggest challenge about being blind or not able to drive, this transportation situation'. (Roger)*

Being concerned with compensating the person who drives him (in this case, a taxi driver) can be seen as a way to reassert his role as a breadwinner, or as a person who can afford such services, rather than as a person who relies on others for transportation. The fact that men reported experiencing more normative meanings associated with driving can be partially attributed to the relatively high average age of the participants (only two participants were below the age of 50). These men may have relatively traditional ideas about masculinity.

As the majority of the women in this study were also earners, most of the female participants reported trying hard to avoid social exclusion and to sustain their labour market position. While the women did not report having the same normative motivations as men, they did report having practical concerns. Thus, their comments often had a normative undertone related to the loss of independence:

> *'Driving is like when you take away the keys; it's a big independence taken away from you. So that was a big adjustment'. (Eleanor)*

Unlike the men, most of the women in this study were not the main provider in their household, which may have reduced the level of stress they experienced at the prospect of losing their role as a breadwinner. Nonetheless, even among the women who were the major or the sole contributor (single women) of income to their household, the level of meaning they attached to having to stop driving appears to have been lower than that of men:

> *'I stopped driving probably about six to seven years ago. I forget the exact date. I did stop driving, as the eyes got worse ... I had wonderful peripheral field for the disease but it did slowly get worse finally so... I do take the Para-transit bus to and from work'. (Sarah)*

This case is typical of the experiences reported by the other female participants who were contributing a large share of their household's income. While giving up driving clearly posed a challenge, these women did not express the same degree of emotional loss or identity conflict as some of the men in the sample did.

While the considerations described above are incentives for prolonging driving, the participants eventually stopped driving after they had either encountered dangerous situations or felt that they might encounter them in the near future. Six of the participants reported having repeated accidents (and three reported experiencing "near misses"). Some of the participants did not stop driving until after they had been involved in a "high impact" accident, in which they could have hurt themselves or someone else. This is illustrated in the following case:

> *'Even though I was driving—at that point mostly on the weekends—I knew that there would come a point that I wouldn't be able to drive. 2003 I couldn't drive anymore. I actually had a freaky experience on the road. I drove up on the sidewalk. I just was happy to get home and at that point I called my middle son and gave him my car. I swore I would never get behind the wheel. It was interesting because the doctor was right, cause he said when it was time to give it up, you would know. Well I now know. So I was without a car, it hurt my ego more than anything else. It hurt my independence'. (Dylan)*

A number of the participants in this study said that they needed assistance in determining when they should stop driving. However, several also reported that the instructions they were given by health professionals for assessing when they should stop driving were unclear. For example, some participants said that their ophthalmologist (or other eye specialist) told them

that they would know when to give up their license. This advice did not appear to be effective, as many individuals ended up waiting to give up driving until they had a clear sign that they were not longer to competent to drive, such as having an accident. In the following, a participant explains how he assessed his driving skills:

> *'I didn't crash or anything but I was driving on the freeway and maybe there was a car on my left. My parents were like, "Oh there's a car"; but the thing with RP [Retinitis Pigmentosa] is you never know what's normal misses. What are normal misses versus RP misses?... They [other drivers] cut you off with no blinkers, you'd never see, you'd never know. Some things are very normal. You glare at the sunlight, intensified by the RP but it's also not easy for the average person... You never know, is it me now at age 42 is it the RP? I'm at the point where it's shifting'. (Dick)*

Self-assessment of risk is thus a challenge for participants, and can lead to prolonged risk-taking.

4. Discussion

In this study we used qualitative methods to gain insights into (1) how white-collar workers with degenerative eye conditions experience and deal with changes in their perceived abilities and their resources over time when choosing whether to drive to work or to use alternative modes of transportation; and (2) how they motivate the choice to continue or to stop driving.

Concerning the first question, we found that the majority of participants continued to drive after their eye condition was diagnosed, and even as their visual decline advanced. While it is generally acknowledged in the literature that people with low vision and blindness face disadvantages associated with not being able to drive (Marston & Golledge, 2003), few studies have looked at the preferences of and the actual commute modes used by people who are visually impaired, including driving (Gallagher, Hart, O'Brien, Stevenson, & Jackson, 2011; Golledge et al., 1997).

The findings indicate that the majority of participants in this study, and especially the men, tried to find modes of transport that helped them avoid social exclusion. For example, many of the participants reported that they went from continuing to drive as before, to driving only under certain conditions, and then to being driven by others. However, the wide range of commute mode solutions cited by the participants illustrates that social exclusion is not a dichotomous state. The shifts between commute modes reflect the gradient in the degree of social exclusion within the narrative of each individual participant, and between the participants. For instance, the participants who exhibited the first pattern of behaviour left the labour market as soon as they stopped driving, which is indicative of a high level of social exclusion. By contrast, the participants who had access to rides to work were able to maintain their labour market position, and thus experienced little social exclusion. However, the individuals who relied on rides had a higher degree of dependence on others than the individuals who moved to be closer to their work. This gradient in the experience of social exclusion is in line with previous research that stressed the importance of investigating social exclusion on a continuum (Schwanen et al., 2015).

Our results for the second research question, regarding the reasons for continuing to drive show that, in line with the social exclusion framework, the participants were motivated to continue driving by practical and normative concerns. From a practical point of view, many participants perceived that being unable to drive would hamper their independence and their access to amenities. From a normative point of view, we found that the meanings attached to driving and the desire to retain the breadwinner role led many of the male participants in particular to continue to drive.

The normative motivations for continuing to drive are related to the meaning attached to the commute mode. Our results regarding these motivations are in line with the findings of previous studies. A study in the UK showed that many older individuals, who grew up with a strong norm of self-reliance, stopped participating in activities that could only be reached by car when they could no longer drive (Schwanen, Banister, & Bowling, 2012). Furthermore, Gardner and Abraham (2007), who studied the role of the car among the general population, suggested that the instrumental motivations (closely related to practical motivations) and the affective motivations (closely related to normative motivations) for driving should not be treated as mutually exclusive, but should instead be considered together.

The finding that only male participants reported strong normative motivations for driving may point to the traditional cultural attributes in western societies associated with driving a car, such as manhood and masculinity (Carrabine & Longhurst, 2002; Sheller, 2004; Urry, 2007). These normative expectations may also relate to findings that men tend to evaluate their driving competence more highly than women (Ruechel & Mann, 2005; Siren & Meng, 2013).

While their assessment of the risks they faced by continuing to drive eventually led the participants to stop driving, many of the participants reported they were not certain *when* they should quit. This uncertainty led some participants to continue driving until they had been involved in one or more car accidents. These results are in line with those of previous studies on older populations with visual impairments, which indicated that many of these individuals engage in risky driving behaviour (Szlyk et al., 2002).

The period during which people with visual impairments restrict their driving appears to be important. While previous literature indicates that self-regulation of driving is a factor which is important for avoiding risky driving behaviour among at risk groups (Rudman, Friedland, Chipman, & Sciortino, 2006), our study illustrates that individuals with degenerative eye conditions have difficulties in assessing the point at which driving becomes too risky for them and their surroundings. Individuals tend to continue driving after they have reached the point at which they can no longer adjust their driving in order to engage in safe driving. This tendency may in part be because individuals are often told by health professionals that they

should self-asses when to stop driving ("you will know when to stop"). As most people are motivated to continue driving for both practical and normative reasons, it is important that health professionals guide the decision to stop driving more strictly. Alarmingly, research shows that health professionals feel ill-equipped to provide concrete guidance on determining the point of driving cessation, and often feel that giving such advice is in conflict of interest with their role towards the patient (Jang et al., 2007; Marshall, Demmings, Woolnough, Salim, & Man-Son-Hing, 2012). Policy makers should consider providing stricter guidelines and support for health professionals faced with this task.

While this study makes some important contributions, it also has some limitations. First, the participants in this study were not asked directly about their car usage or commute mode, but rather about their work trajectories and the challenges they encountered in this context. This can be seen as both as an advantage and a drawback of the study. On the one hand, our approach clearly shows that commuting plays a very important role in obtaining and sustaining work for individuals with degenerative eye conditions, and that being able to get to work greatly affects their labour market participation. On the other hand, the full extent of this problem cannot be assessed here because the topic of driving was not a focal point of this data collection.

Second, the data collection was done using two methods, i.e., face-to-face and by phone. While this can be perceived as a drawback, the average length of the interviews was similar regardless of the method used. Thus, while we acknowledge that variation in the method of data collection can affect the quality of the data collected, we are confident that this is not the case here.

Future research may try to quantify some of the issues dealt with in this paper on a larger scale, such as the experiences of practical and normative motivations for driving, and relate them to the likely employment trajectories and general experience of exclusion of this sub-group. Additionally, as the visual requirements and regulations for drivers differ between states in the United States (Fishbaugh, 1995), researchers should examine how these regulations are related to commuting behaviour among this population.

To summarize, our study illustrates that while driving is often neglected in the literature on the commuting behaviour of people with vision impairments, the reports of our participants indicated that it is a central commute mode among individuals experiencing vision decline in the United States. As the number of individuals affected by vision loss (one in 28 adults over the age of 40 in the United States: Eye Diseases Prevalence Research Group, 2004) is rising, it is important to consider the possible consequences of social exclusion for the health and the overall well-being of this group.

Existing commuting modes accommodating for this group such as Para Transit, were reported by a few participants as inefficient and normatively unattractive. Furthermore, research shows that the Americans with Disability Act has increased costs for local governments which they were unable to fully cover, resulting in an overall reduction in the quality of public transportation for individuals with disabilities in the United States (Lewyn, 2000).

Given the high car dependency in the United-States, solutions should be of a non-stigmatizing nature and should increase time efficiency. On the short term, for instance, policies that incentivise car-pooling within the workplace may be a suitable solution. Participants who could no longer drive were receptive to being driven by others (primarily partners and co-workers). Such a solution is cost effective and may provide individuals with a better feeling of social inclusion than the alternatives currently available. Further research is needed to distinguish which types of solutions are most attractive and practical for this and comparable groups.

On the long term, transport planning policies within the realms of the sustainable mobility paradigm (Banister, 2008) aim to reduce overall car dependency and its associated negative impacts on the environment. Expanding public transport and decreasing travel distances through land use densification are long term pathways to reduce overall car dependency and hence decrease the risk of social exclusion among individuals with degenerative eye conditions and comparable disadvantaged groups.

Disclosure statement

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