Thesis progress report 4/5/2020

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4-5-2020

Progress overview

What have I done since our last meeting?

I first went back to my hypotheses and summarized what I wanted for each of them on the analysis side. This is what I came up with:

1. Lower payment method transparency reduces mental accounting opportunity.

I want to show how the type of payment and its transparency (so how salient the spending of money is when using this method) affect people's ability to use reason when deciding on their purchases. In other words, using a payment method that is less transparent might reduce people's chances to correctly predict the impact of their purchases, thus increasing the chance that they commit to purchases that could destabilize their financial situation.

Data exploration

The variables used in testing this hypothesis need to be related to payment methods and mental accounting opportunity. Payment method indicators exist in the dataset, except for cash payments. A proxy needs to be found for this. Mental accounting opportunity can be described using measures for people's spending behaviours and attitudes toward saving. These could be of varying directness (e.g. amount of savings, attitudes towards saving, social security benefits, etc.), though caution is needed when using some of the less direct variables in regards to drawing conclusions. Theory link needs to be found for this (better mental accounting -> more conservative spending habits).

2. Pain of paying is increased as a purchase becomes more complex.

Pain of paying follows from the concept that letting go of your money is difficult, since you trade something with direct value (money) for something with abstract value (product). As a product becomes more specialized (e.g. costs more, has more variants, is relevant for the future, etc.) the transaction becomes more complex (as the PoP gets weighted against this increasingly complex transaction). Figuring out how much this difference is will give better insight in the dangers of pain of paying at any level.

Data exploration

Variables to be used here are measures for pain of paying and different types of purchases. Groups can be composed to see what types of purchases are done by people who use certain payment methods. This also gives more information indicating what types of purchases are more complex. Pain of paying requires some form of hedonic measure, or a timeframe spent on doing research before the purchase. The choice of variable used needs theory to back it up.

3. Financial distress is worsened when a debtor has lower budgeting skills.

Showing what levels of financial distress someone is in being (partially) dependent on their budgeting skills (either via mental accounting or physically keeping track of expenditures) is a step needed to show the full cycle of payment -> distress.

Data exploration

Variables to be used here are debt levels (and maybe attitudes toward savings) & relevant accounting skills variables. The budgeting skills could use the same indicators as the mental accounting measures, or be more focused on the physical aspect. Either way, a link has to be established between financial issues and a person's ability to keep track of their expenditures. Preliminary grouping could look at levels of debt, level of budgeting skills, and differences in demographics.

4. Lower payment method transparency causes an increase in the pain of paying.

Show a connection between H1 and H2. By having shown in H1 that lower transparency causes less mental accounting opportunity, and in H2 that PoP is linked to purchase complexity, there should be a clear link between payment method transparency and pain of paying. Bringing the analysis of H1 and H2 together could be enough on its own, though extra tests being needed is likely.

Data exploration

Variables to be used here are a mix of the ones in H1 and H2. Again look at the differences between payment methods and its links with certain demographic groups. The goal is again to show differences between payment methods, but this time link it to pain of paying (which encompasses more than just mental accounting).

5. Increased pain of paying leads to more significant financial troubles.

Show a connection between H2 and H3. Pain of paying is explored in H2, and has been linked to less mental accounting opportunity & lower budgeting skills. In H3 a person's budgeting skill is linked to financial distress, making this hypothesis clear. As with H4, additional tests might not be needed but this is unlikely.

Data exploration

Variables to be used here are the ones used in H2 and H3. The way pain of paying was measured in the previous hypothesis needs to be used again (to keep the reasoning consistent). Financial troubles need to be reviewed at least as thoroughly as in H3, and maybe more (if another variable makes sense now).

Secondly, I went back to the dataset to find relevant demographic variables and deepen my data exploration, as we discussed. I made a selection of main demographic variables and sub-variables to look at. The first group are variables that I wanted to test to see if there is a difference between sub-groups (age, gender, level of income, investments, etc.) whereas the second group were more specific variables to be tested if the main variable showed interesting results. Example: a main variable being whether someone has credit card debt, and sub-variables being the amount remaining as continuous & categorical variables, and the amount remaining at the end of the questionnaire year.

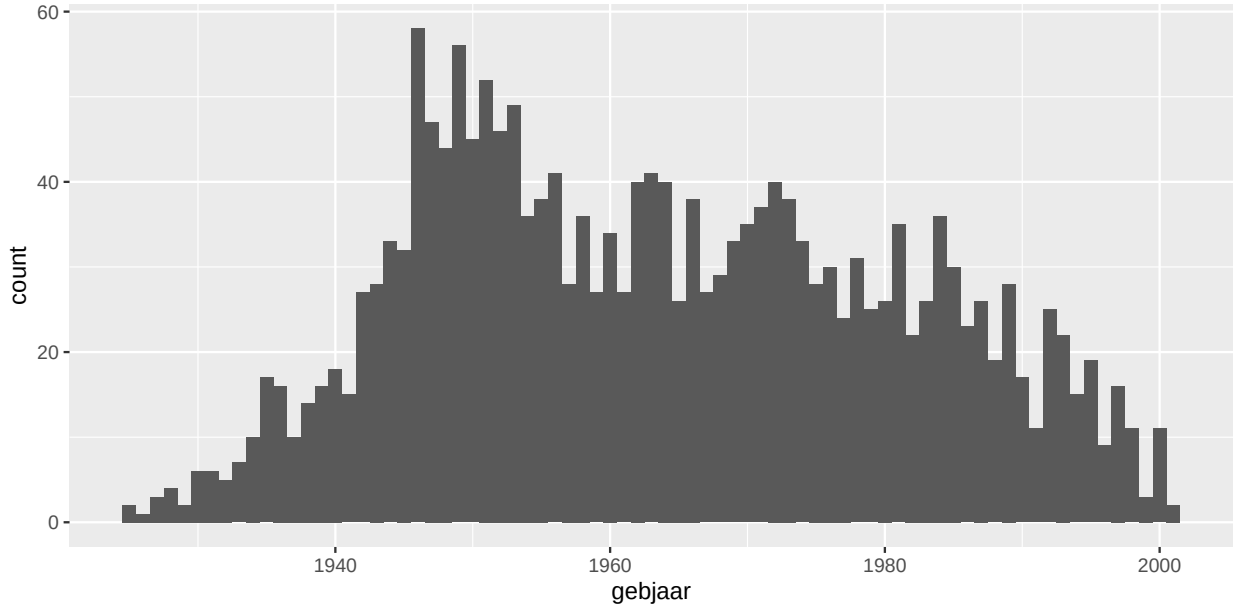
What am I working on right now?

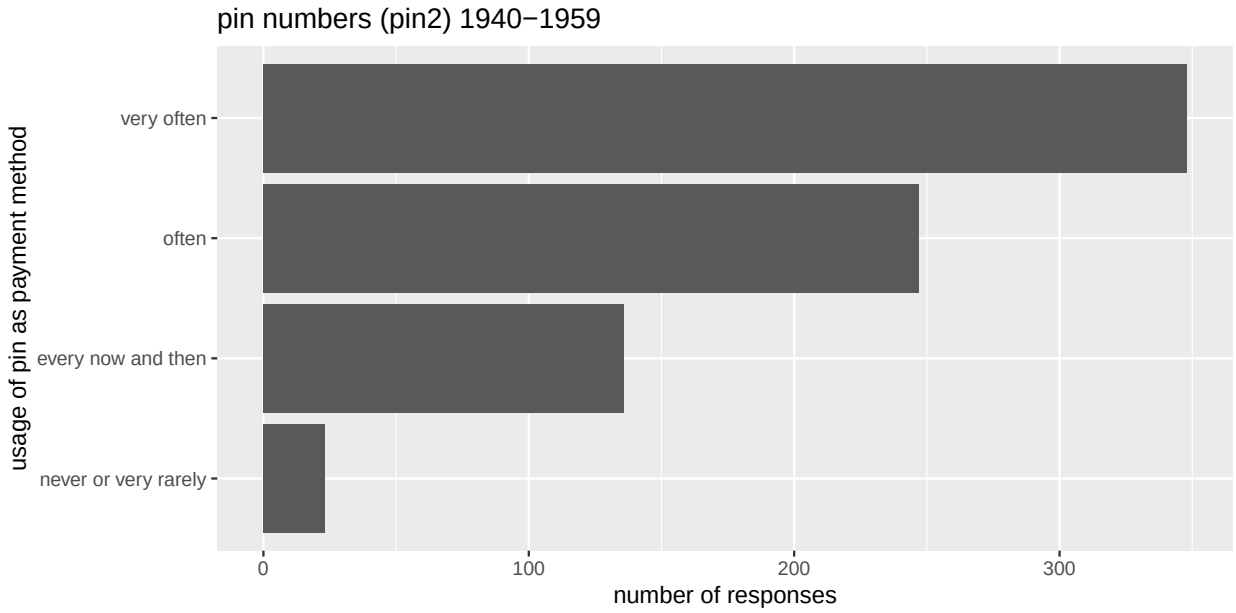
I am currently in the process of working through the data exploration still. I have created graphs for all the main variables and determined which are interesting and which are not. I am currently in the process of selecting which sub-variables are worthwile to analyze and creating multi-layered data exploration (e.g. for the people of a certain age, is there a difference between males/females in payment method usage?). These types of analysis are mainly for the first three hypotheses, as they are meant to establish links between concepts. The fourth and fifth hypotheses could also have their own data exploration/analysis, but will build mainly on the concept research of the first three.

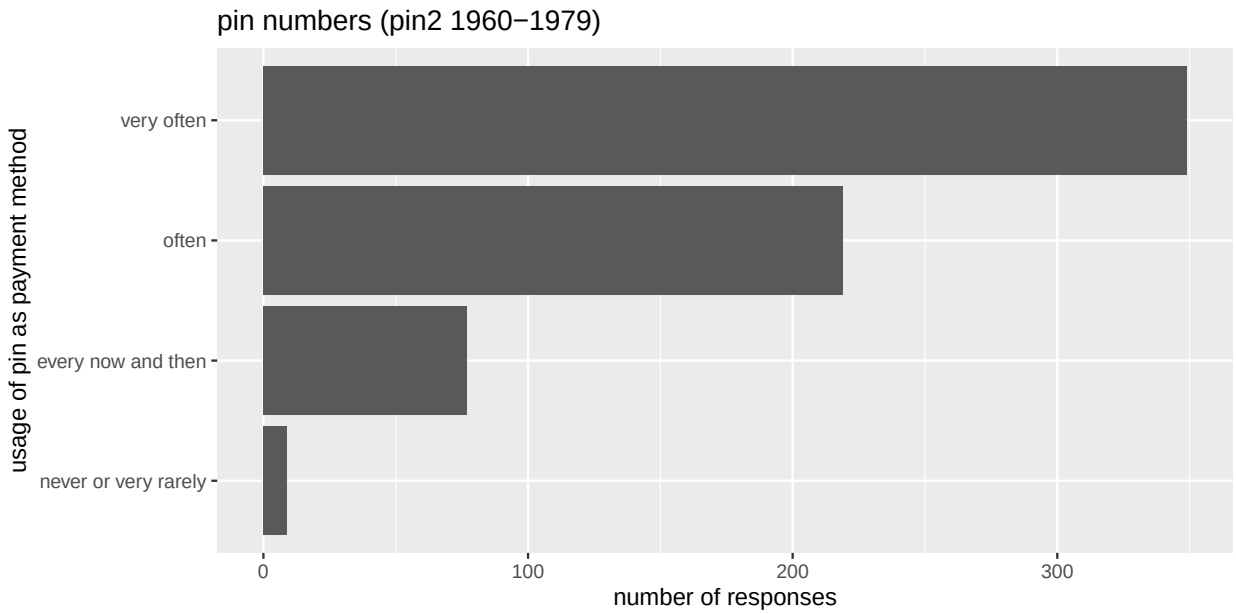
Examples

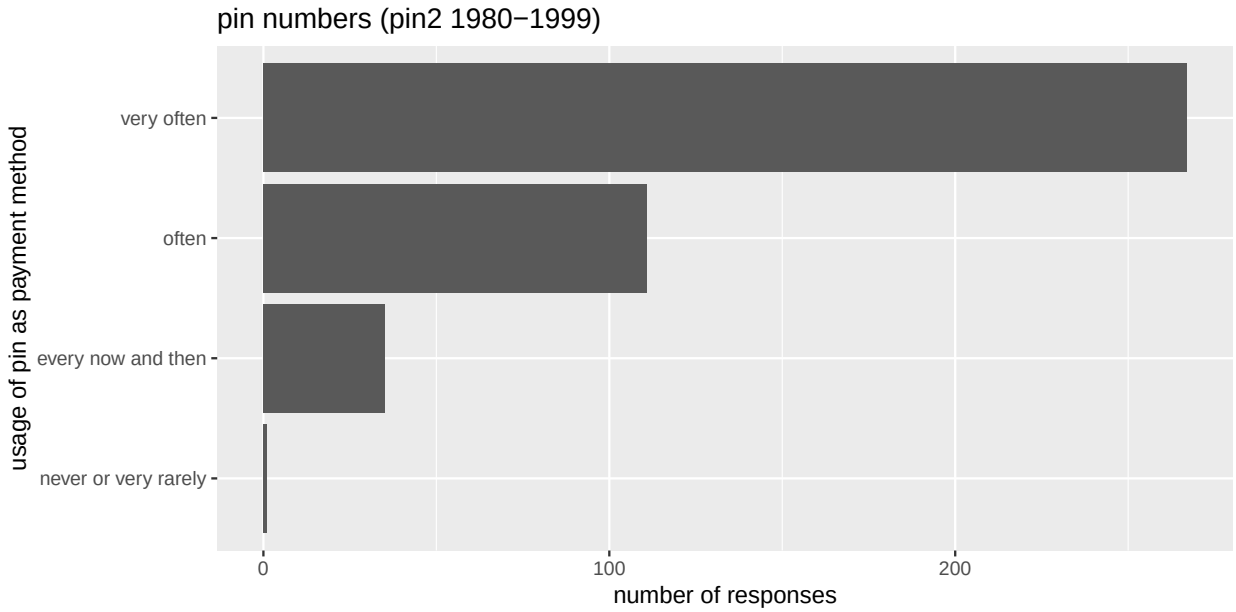
Some examples of interesting effects I've found so far:

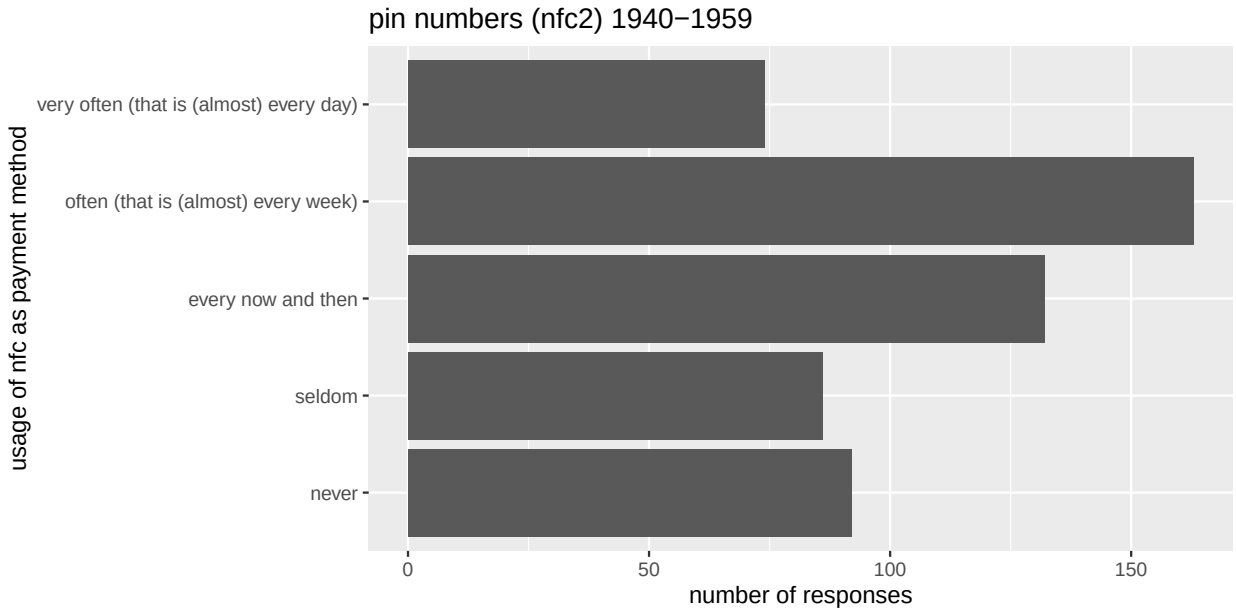
1. Birth year comparison for payment usages

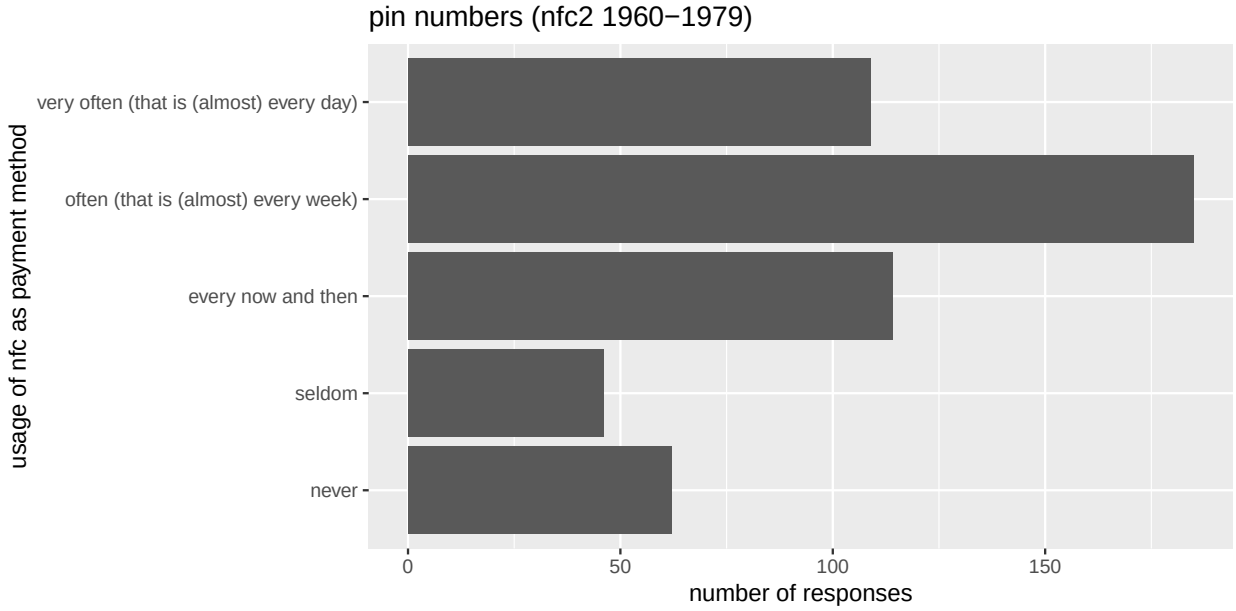





pin numbers (pin2 1960−1979)
usage of pin as payment method
very often
often
every now and then
never or very rarely
0
100
200
300
number of responses


pin numbers (pin2 1980−1999)
usage of pin as payment method
very often
often
every now and then
never or very rarely
0
100
200
number of responses


pin numbers (nfc2) 1940−1959
usage of nfc as payment method
very often (that is (almost) every day)
often (that is (almost) every week)
every now and then
seldom
never
0
50
100
150
number of responses


pin numbers (nfc2 1960−1979)
usage of nfc as payment method
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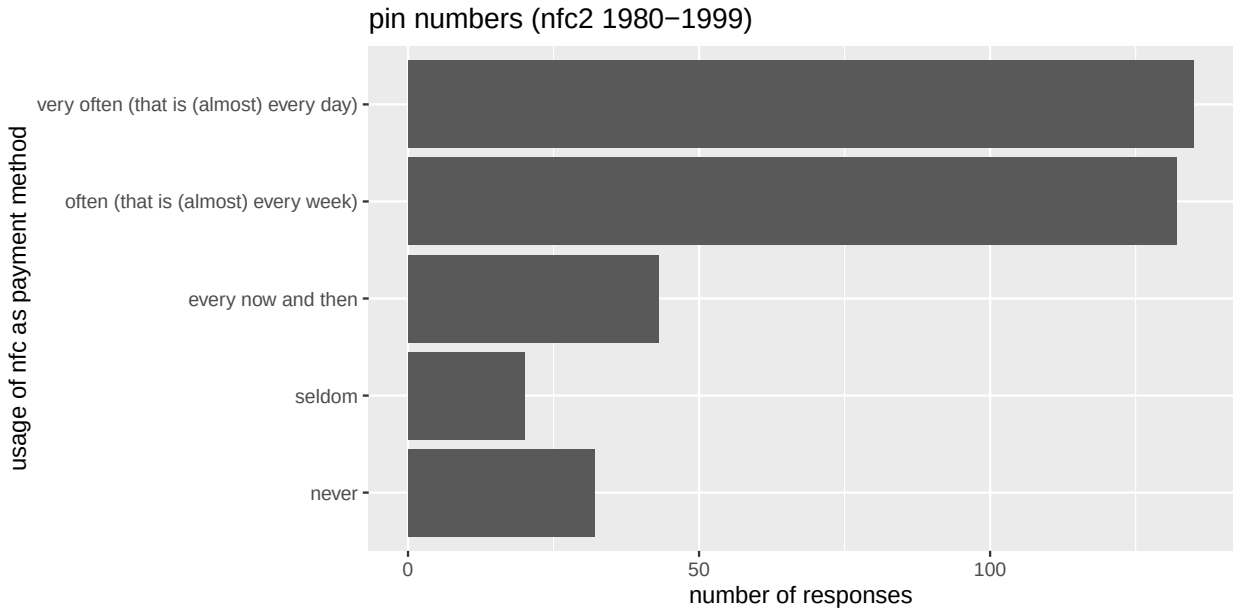
often (that is (almost) every week)
every now and then
seldom
never
0
50
100
150
number of responses


pin numbers (nfc2 1980−1999)
usage of nfc as payment method
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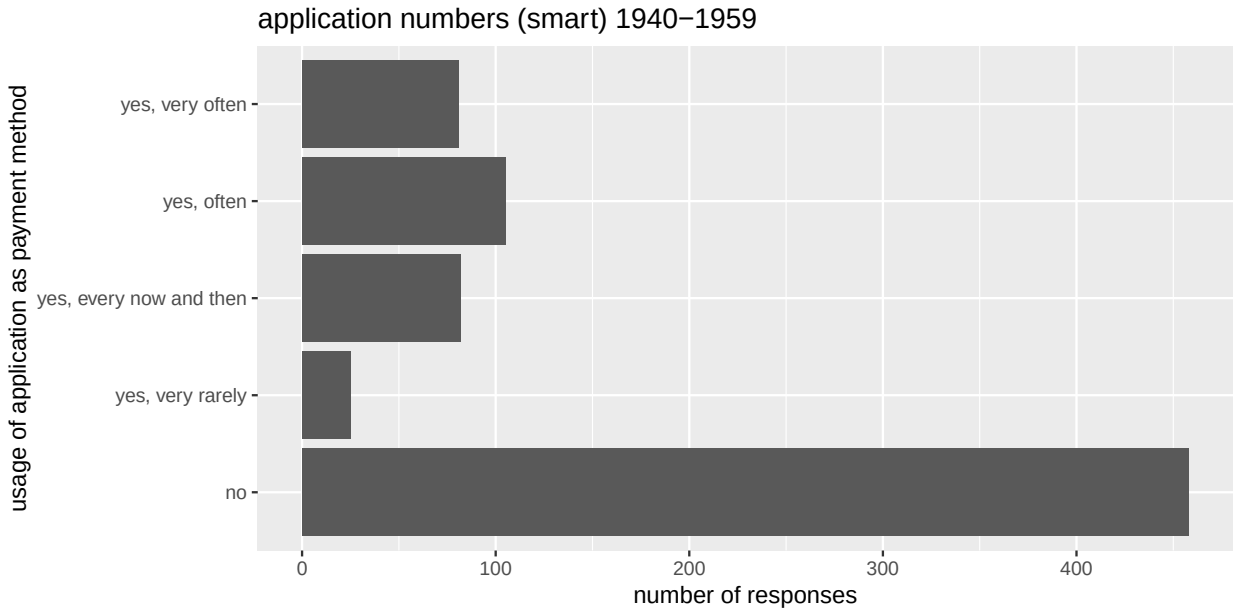
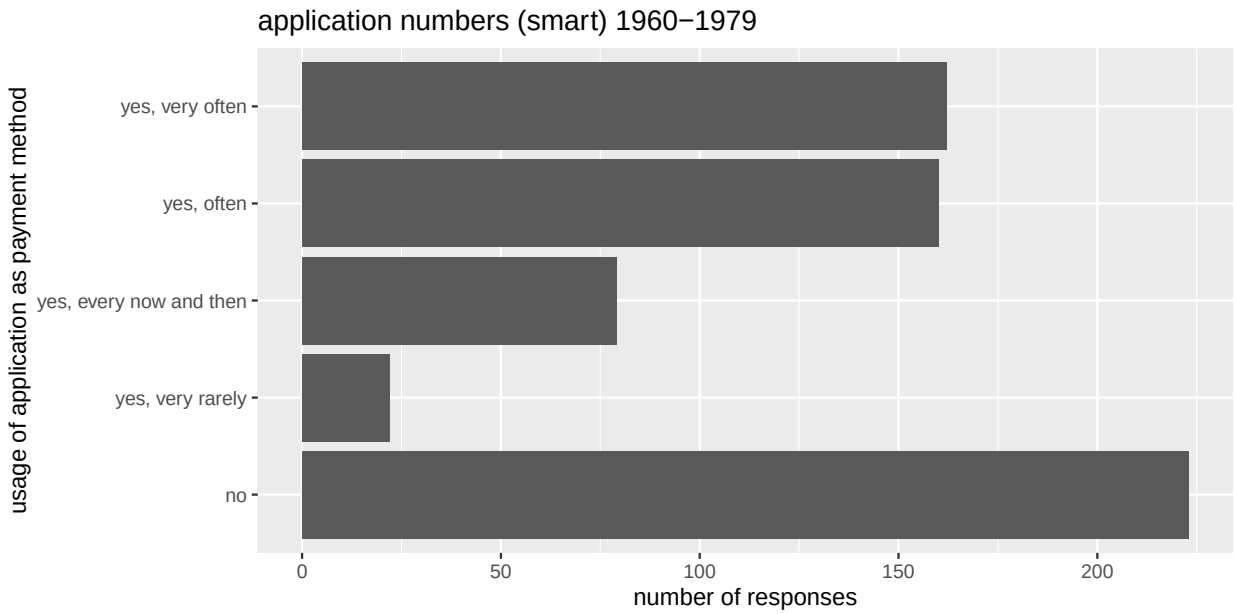
often (that is (almost) every week)
every now and then
seldom
never
0
50
100
number of responses


application numbers (smart) 1940−1959
usage of application as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
100
200
300
400
number of responses


application numbers (smart) 1960−1979
usage of application as payment method
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yes, often
yes, every now and then
yes, very rarely
no
0
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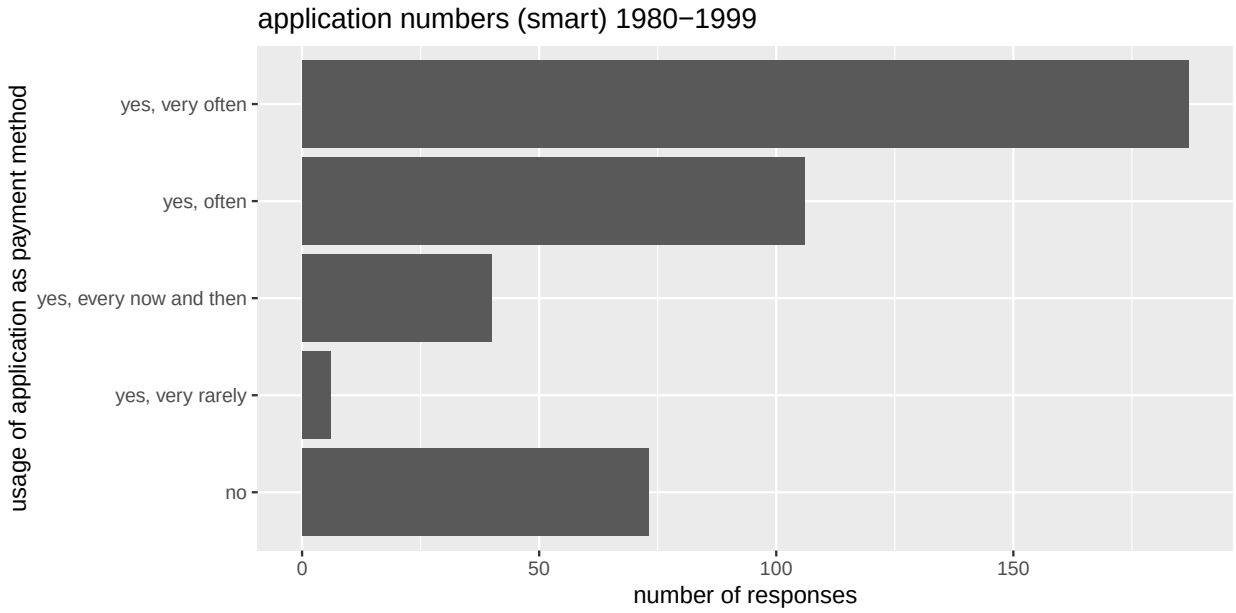
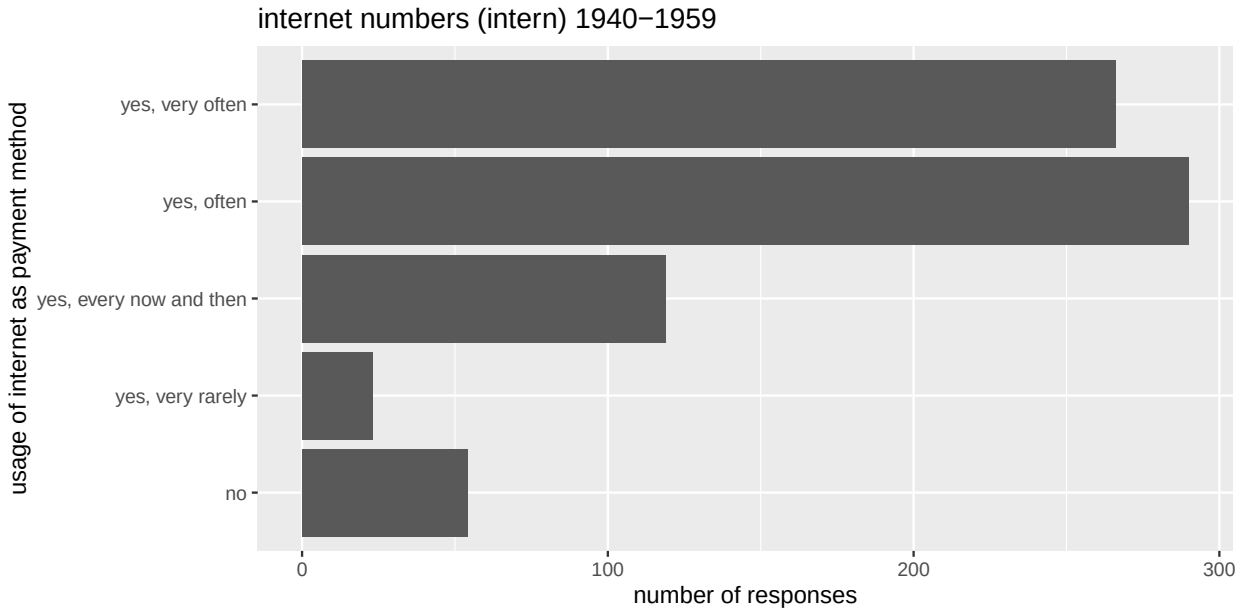
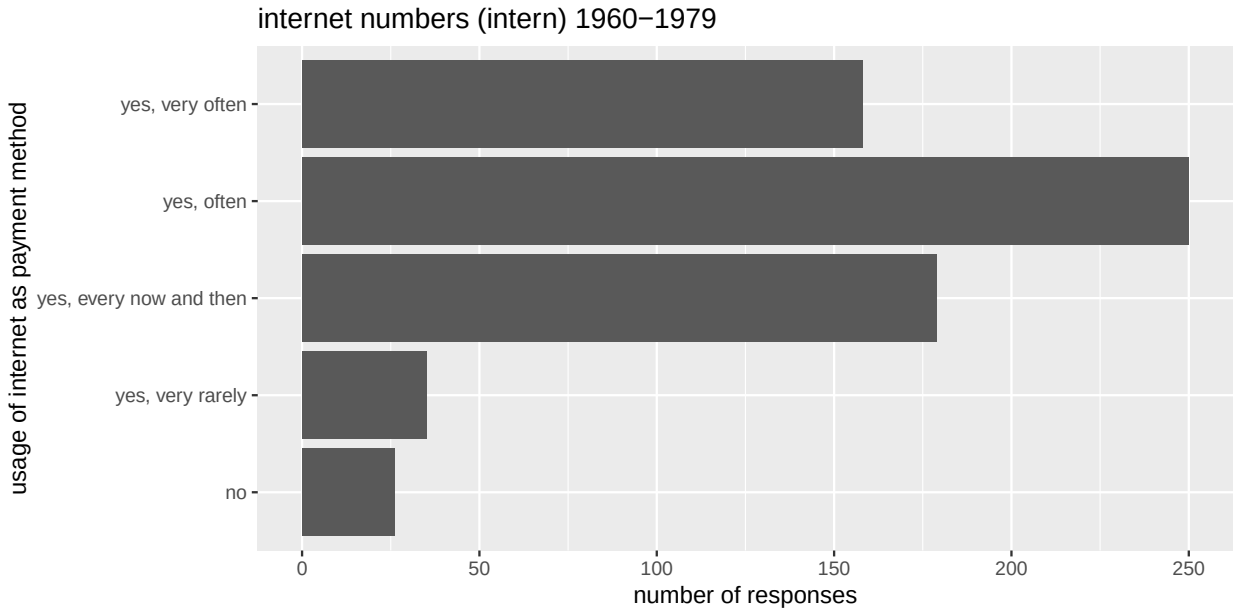
100
150
200
number of responses


application numbers (smart) 1980−1999
usage of application as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
50
100
150
number of responses


internet numbers (intern) 1940−1959
usage of internet as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
100
200
300
number of responses


internet numbers (intern) 1960−1979
usage of internet as payment method
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yes, often
yes, every now and then
yes, very rarely
no
0
50
100
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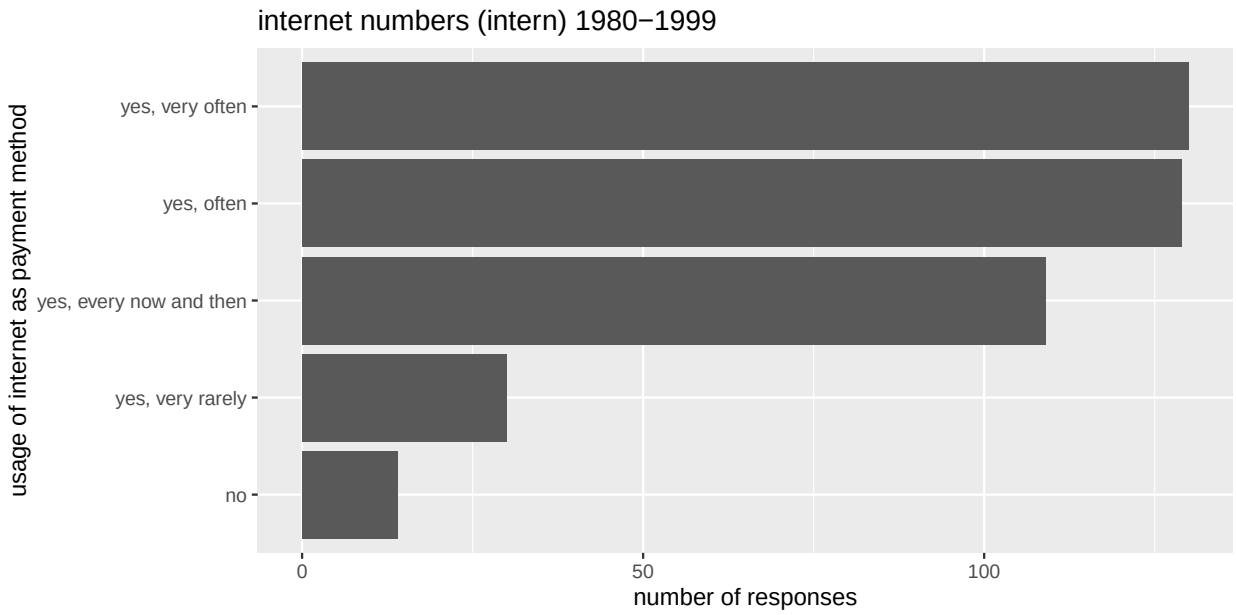
250
number of responses

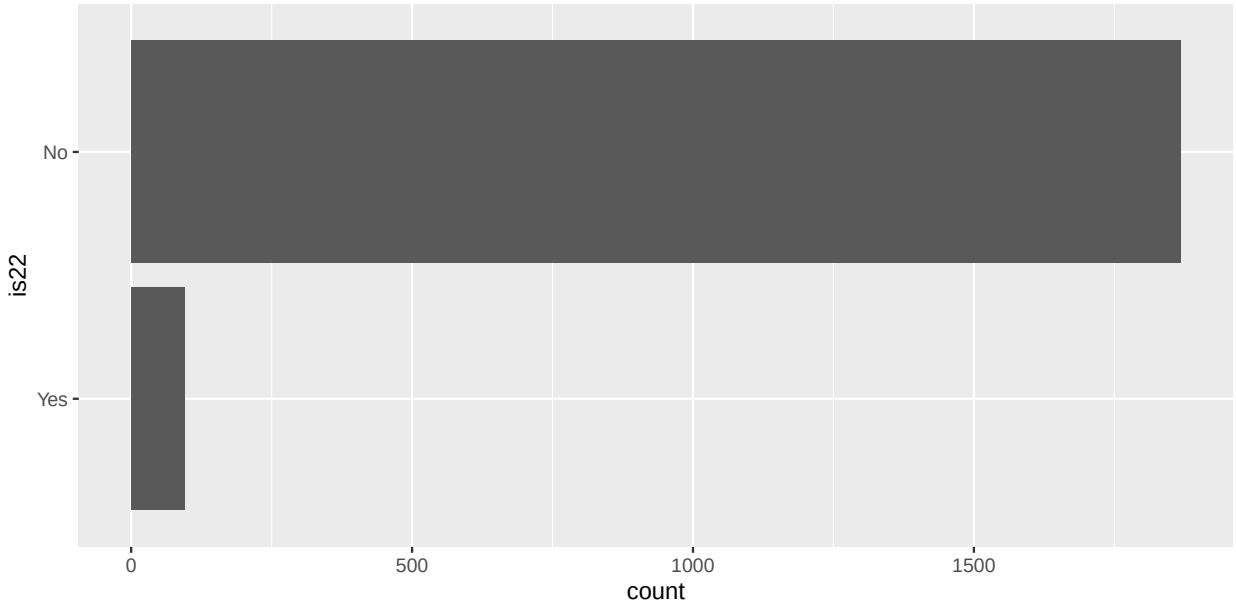


Observations from these graphs:

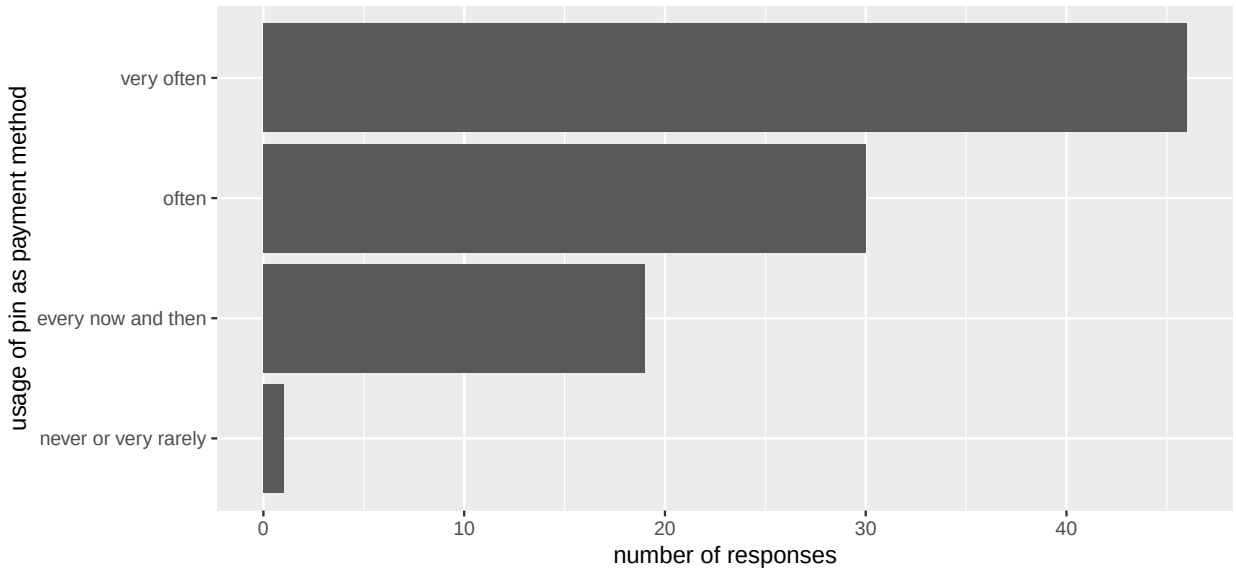
- Dividing into three age groups (1940-1959, 1960-1979, 1980-1999) seems like a fair divison in terms of numbers. The first group seems overrepresented from the age histogram, though there is little that can be done about that.
- PIN trend is similar across the three groups; most people use it "very often" or "often", with the other two options being a little less frequent among younger respondents.
- NFC numbers shift across the groups; the oldest group is balanced between less-frequent and more-frequent users. As the respondents get younger, nfc is used more often.
- Application usage also grows as respondents get younger, though the two older groups have similar usage.
- Internet payment methods are surprisingly used a lot by all age groups.

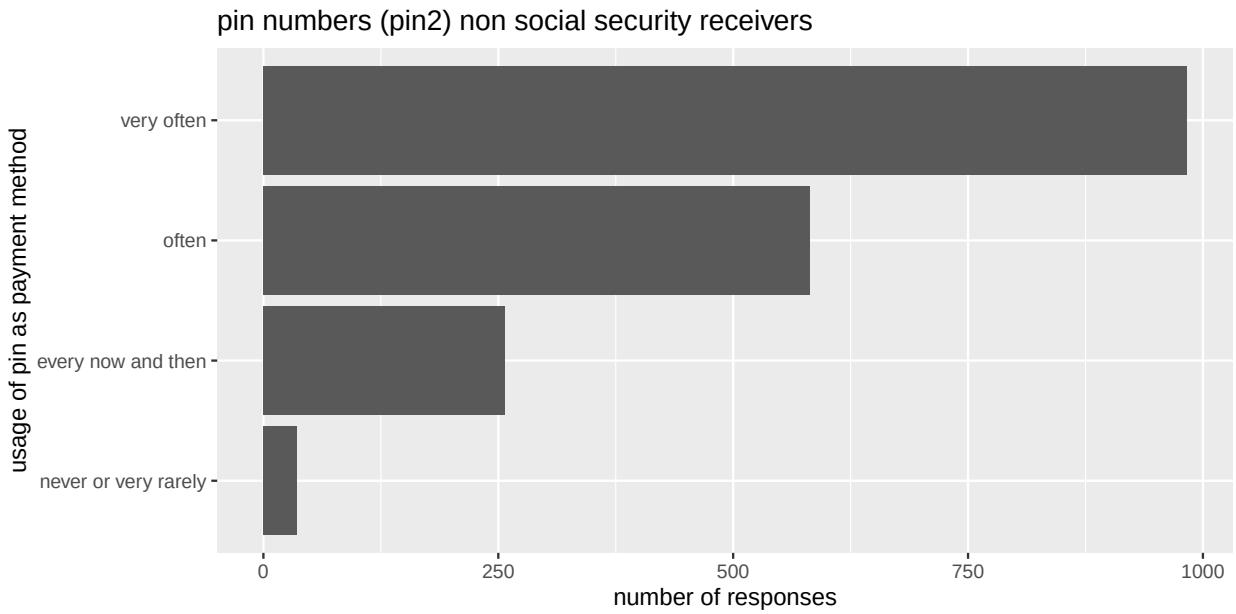
2. Types of social security

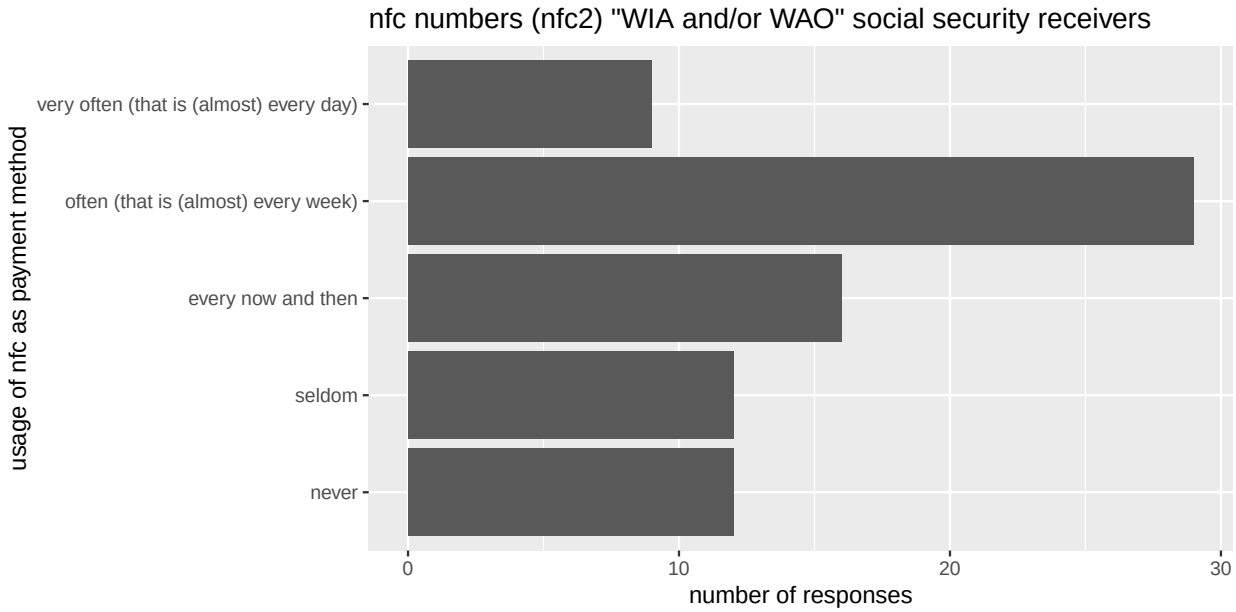
2a. WIA and/or WAO

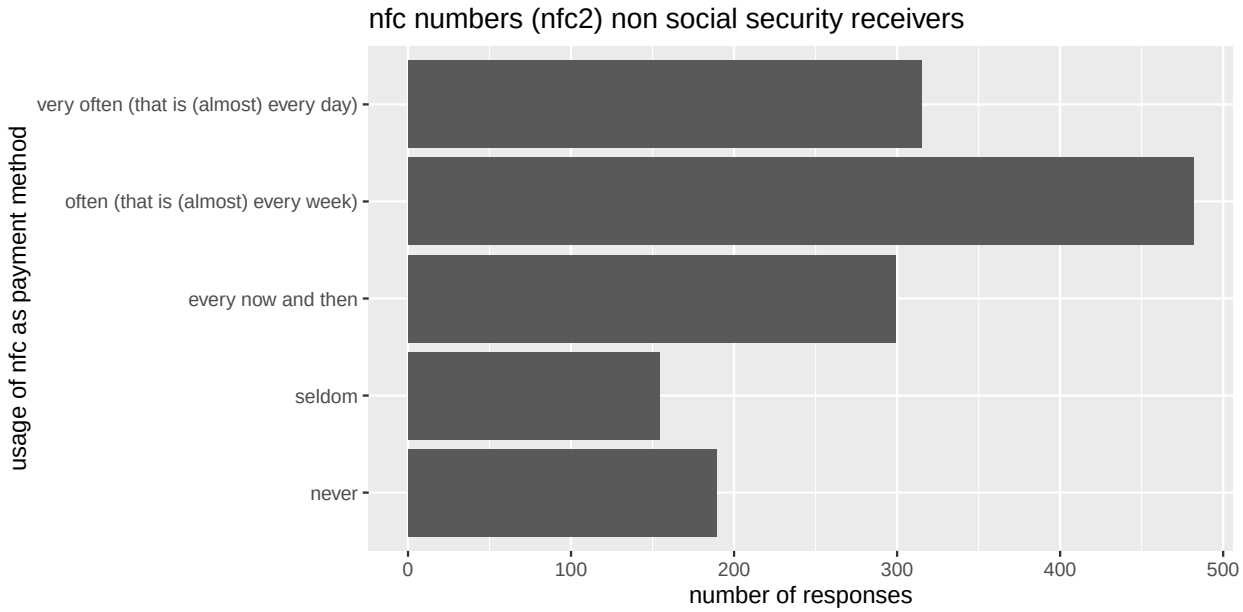


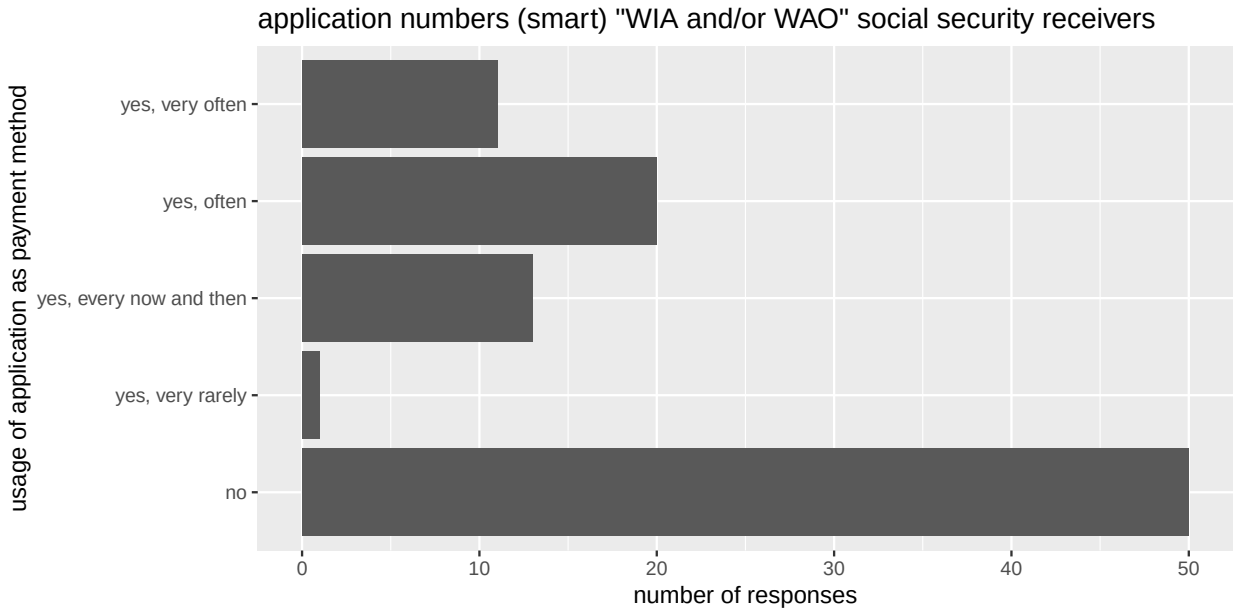
pin numbers (pin2) "WIA and/or WAO" social security receivers

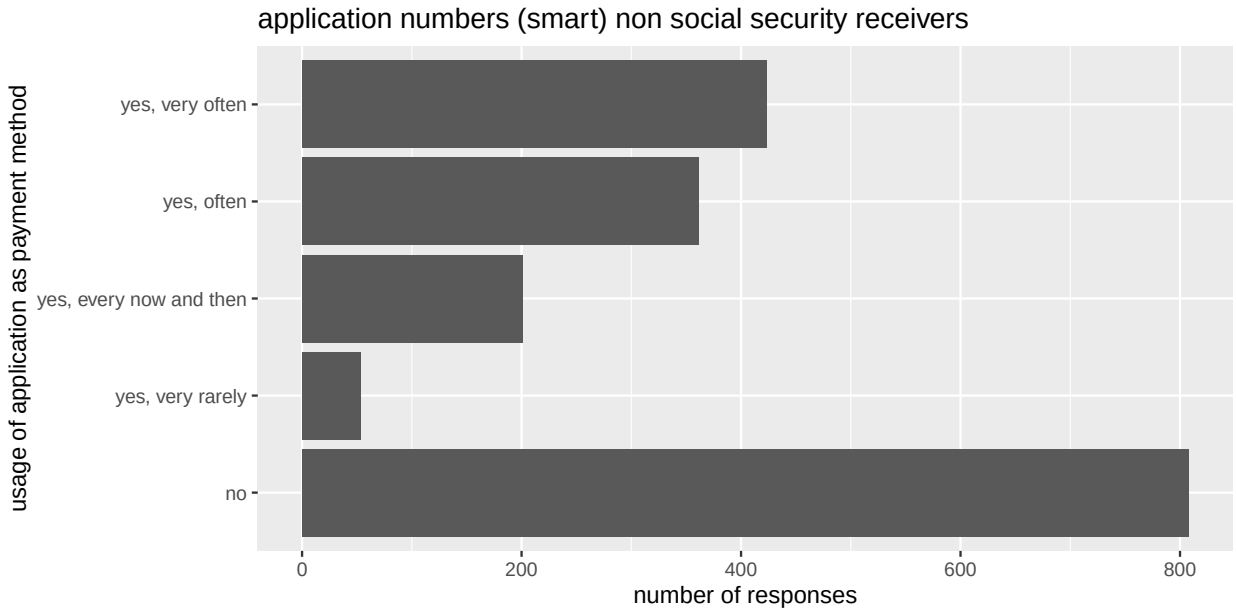


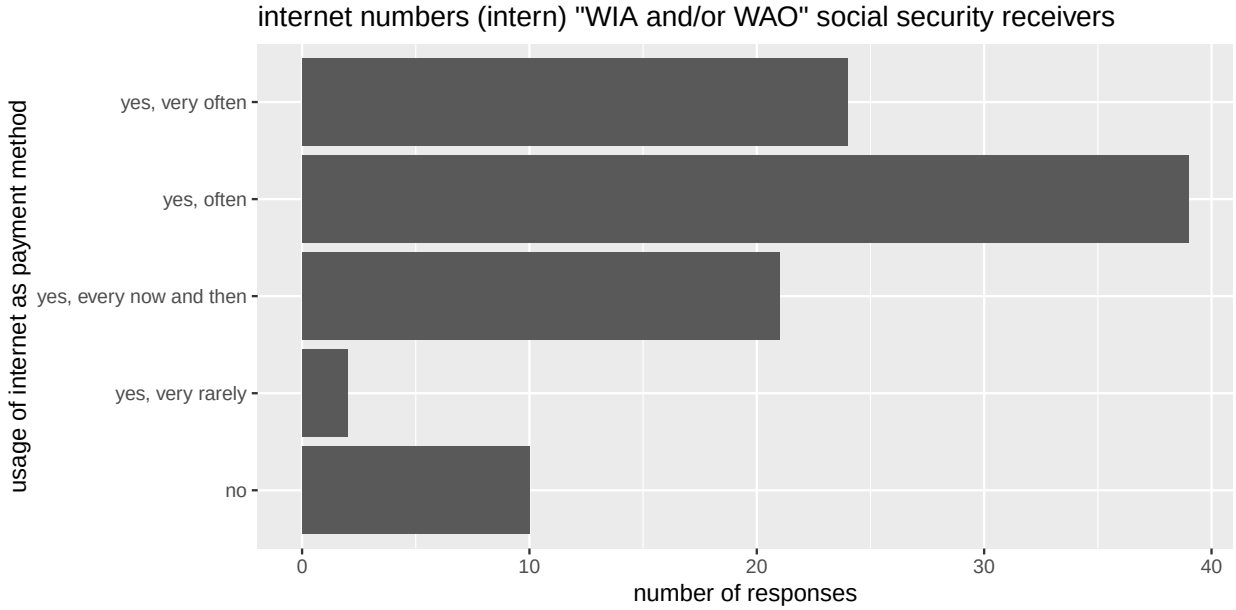

pin numbers (pin2) non social security receivers
usage of pin as payment method
very often
often
every now and then
never or very rarely
0
250
500
750
1000
number of responses

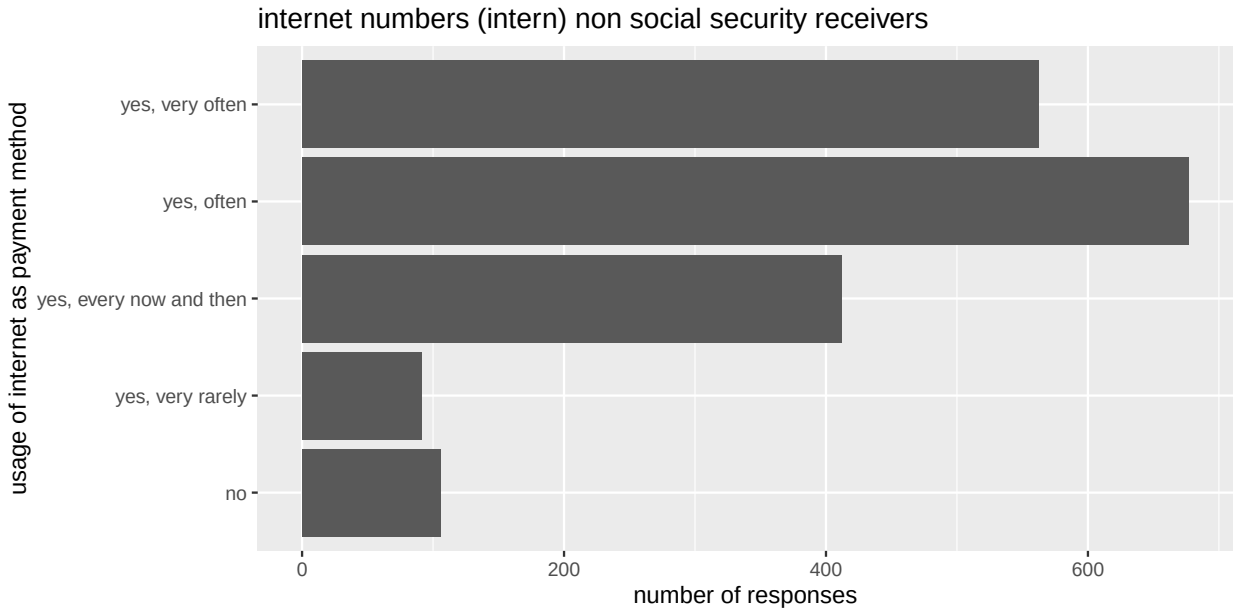

nfc numbers (nfc2) "WIA and/or WAO" social security receivers
usage of nfc as payment method
very often (that is (almost) every day)
often (that is (almost) every week)
every now and then
seldom
never
0
10
20
30
number of responses


nfc numbers (nfc2) non social security receivers
usage of nfc as payment method
very often (that is (almost) every day)
often (that is (almost) every week)
every now and then
seldom
never
0
100
200
300
400
500
number of responses


application numbers (smart) "WIA and/or WAO" social security receivers
usage of application as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
10
20
30
40
50
number of responses

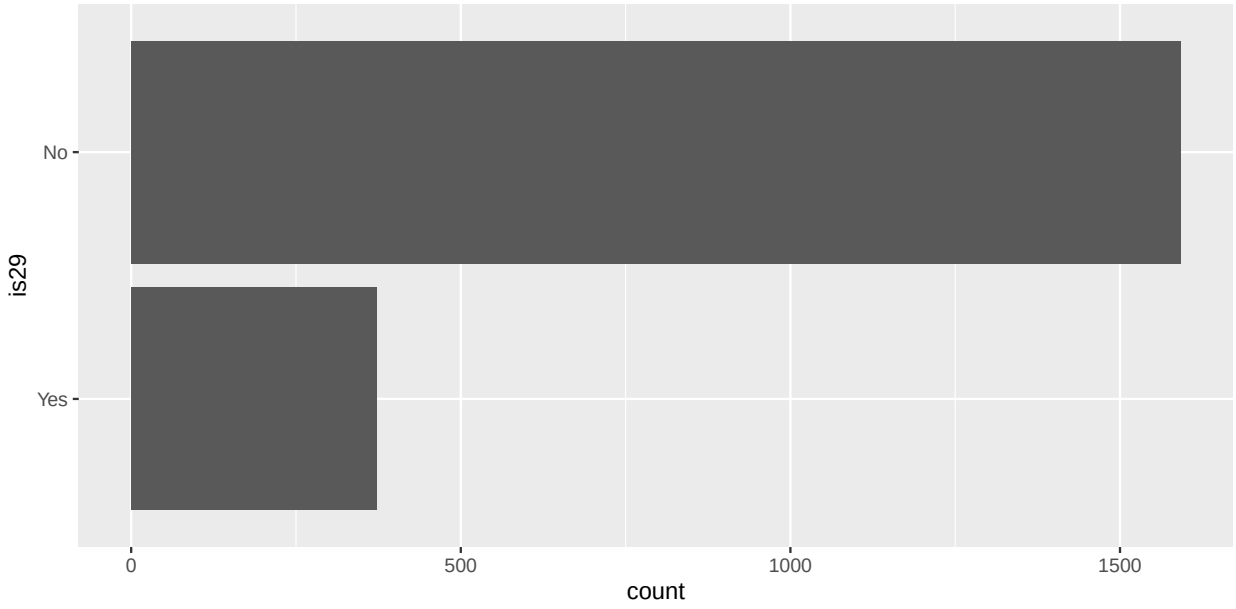

application numbers (smart) non social security receivers
usage of application as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
200
400
600
800
number of responses

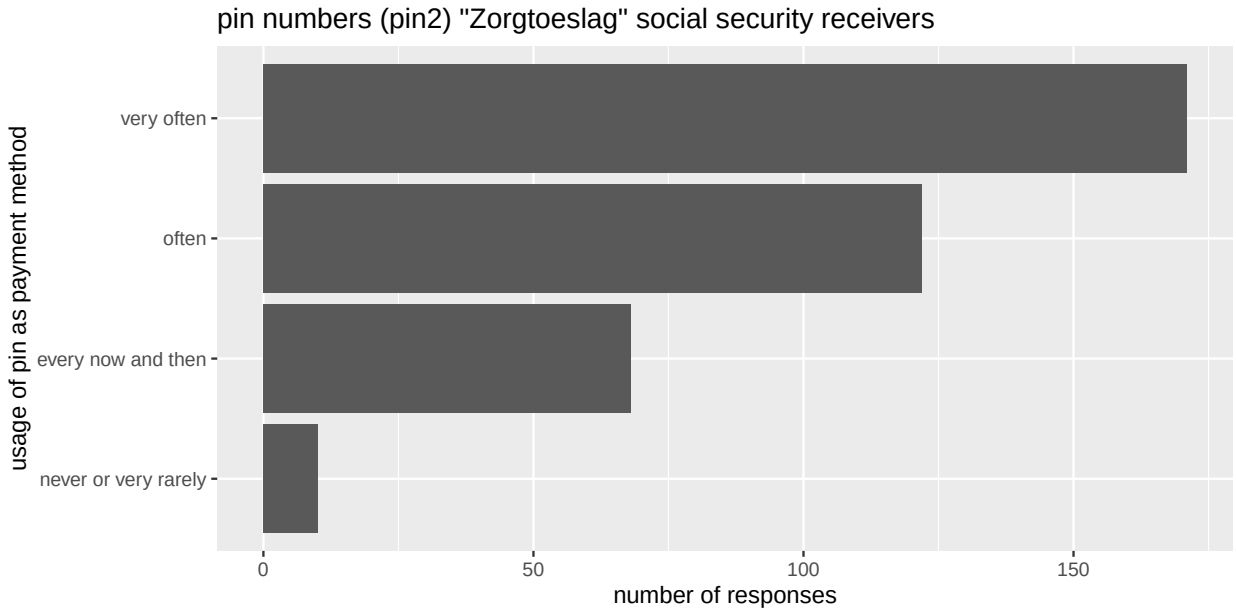

internet numbers (intern) "WIA and/or WAO" social security receivers
usage of internet as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
10
20
30
40
number of responses

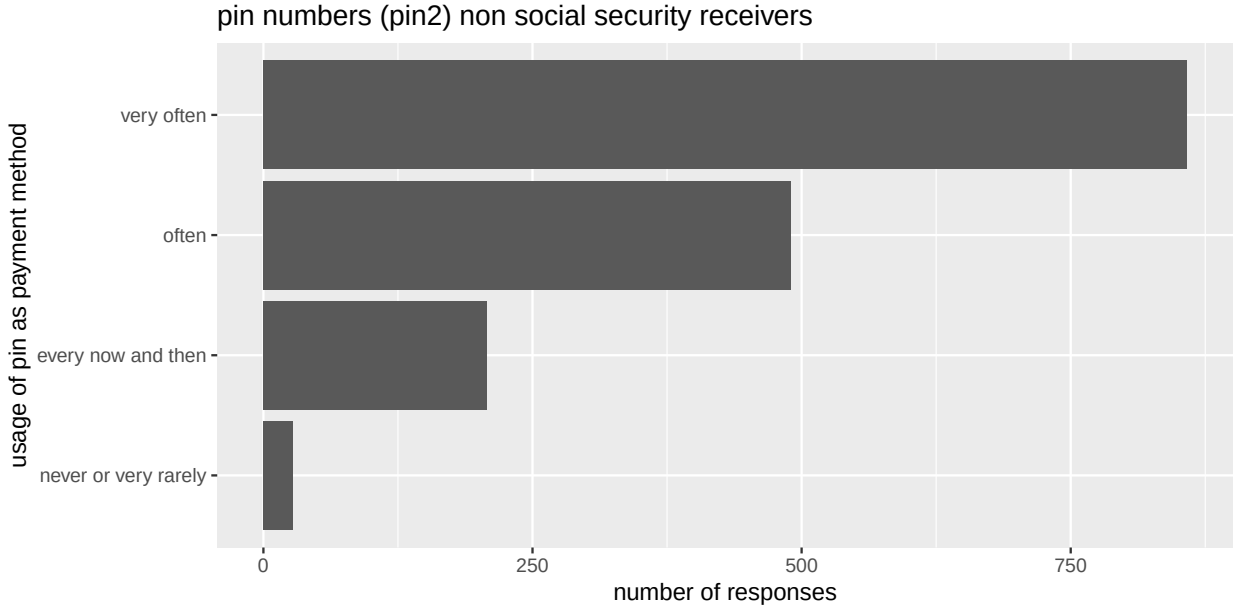


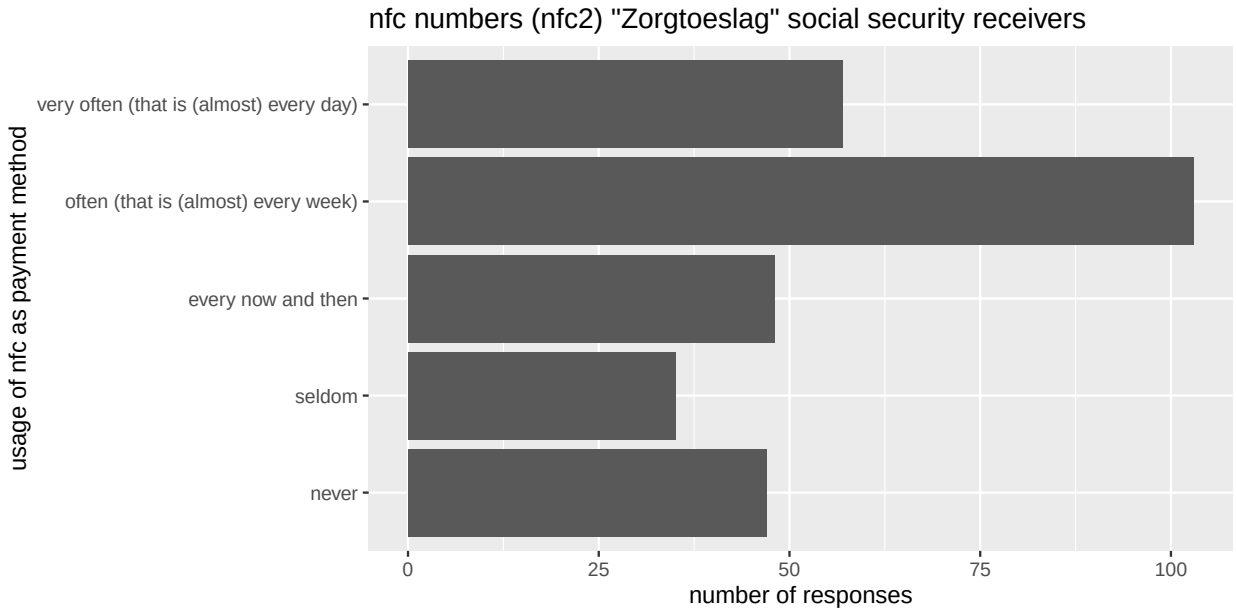
From these graphs it can be seen that people who received WIA and/or WAO use the last three payment methods (nfc, applications and internet) quite a bit less than people who do not receive these social security benefits.

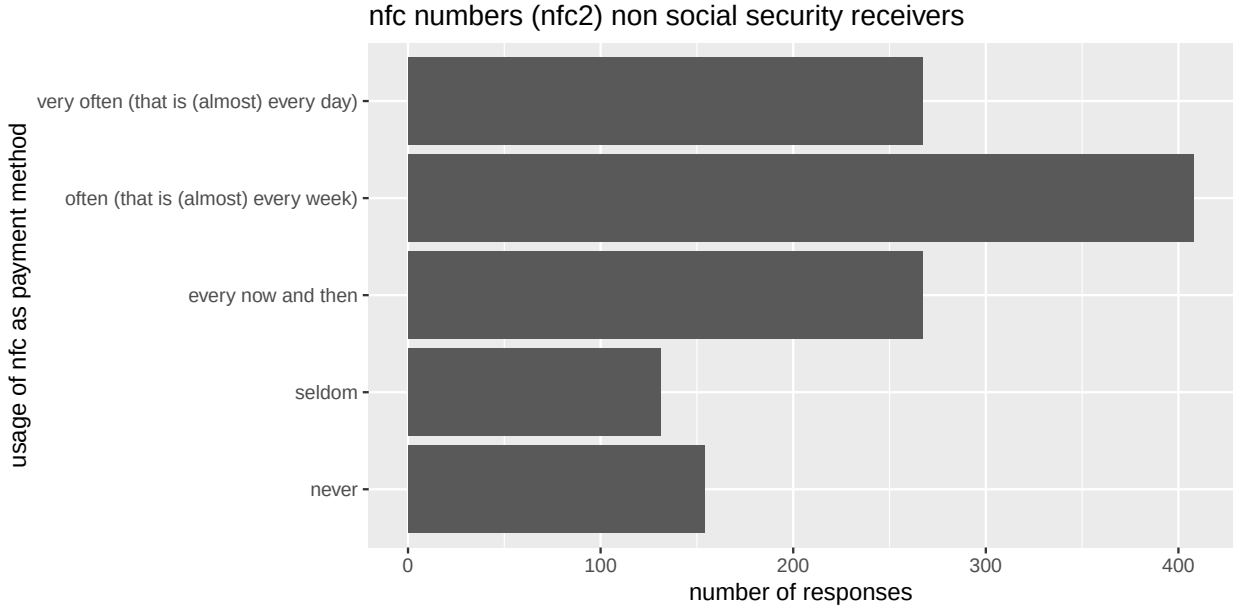
2b. Zorgtoeslag

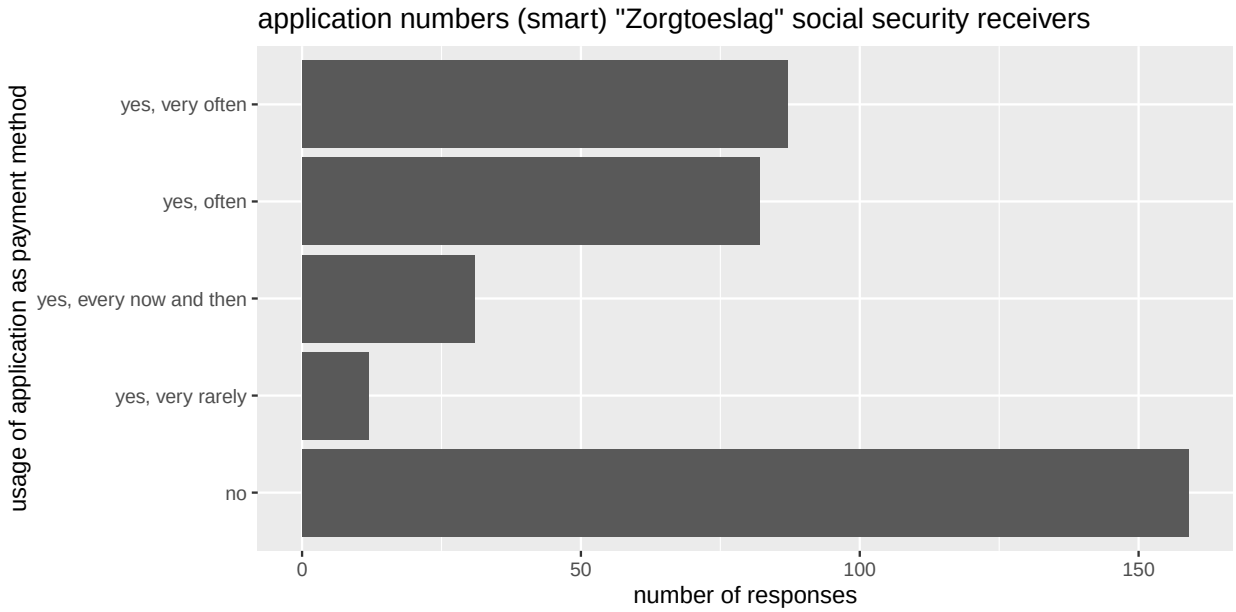


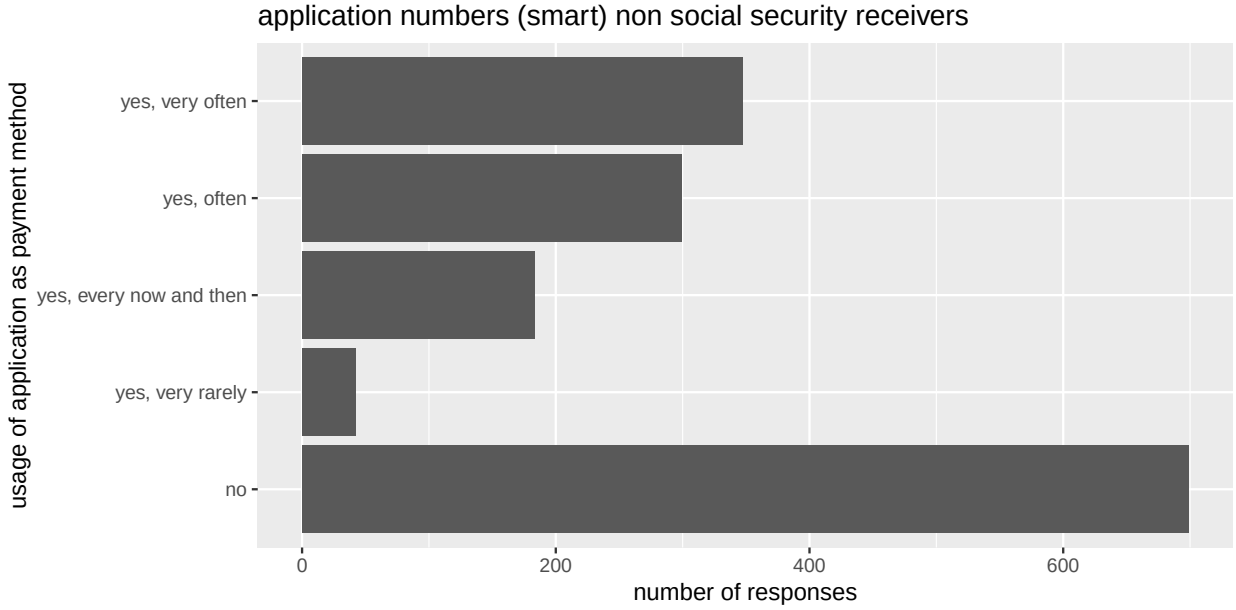

pin numbers (pin2) "Zorgtoeslag" social security receivers
usage of pin as payment method
very often
often
every now and then
never or very rarely
0
50
100
150
number of responses

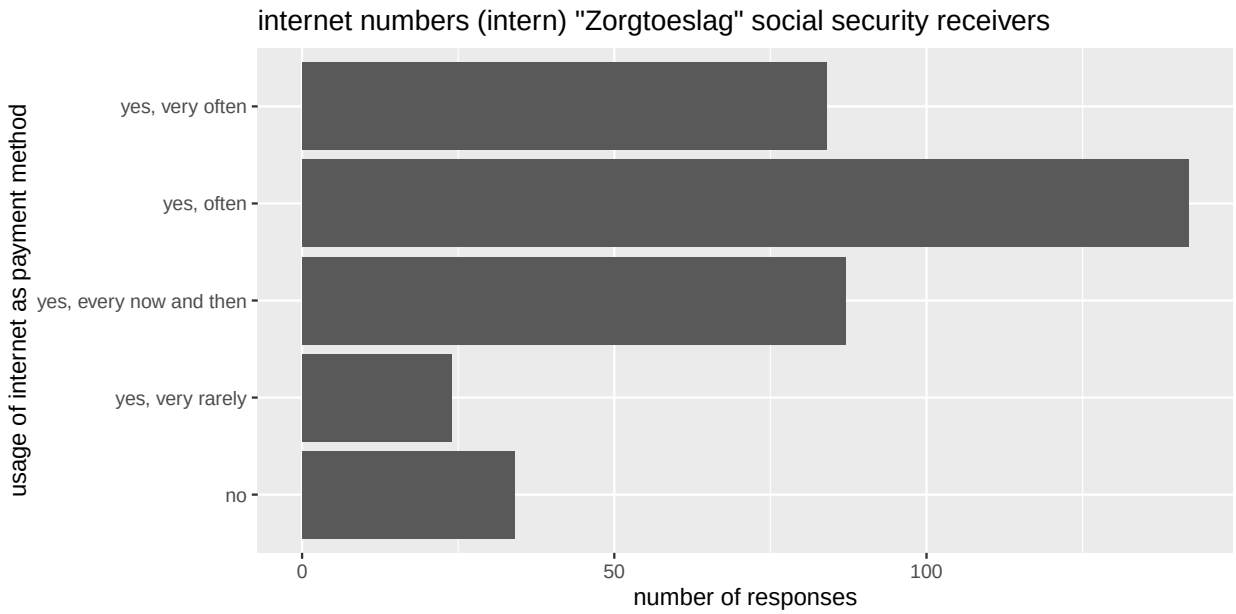

pin numbers (pin2) non social security receivers
usage of pin as payment method
very often
often
every now and then
never or very rarely
0
250
500
750
number of responses

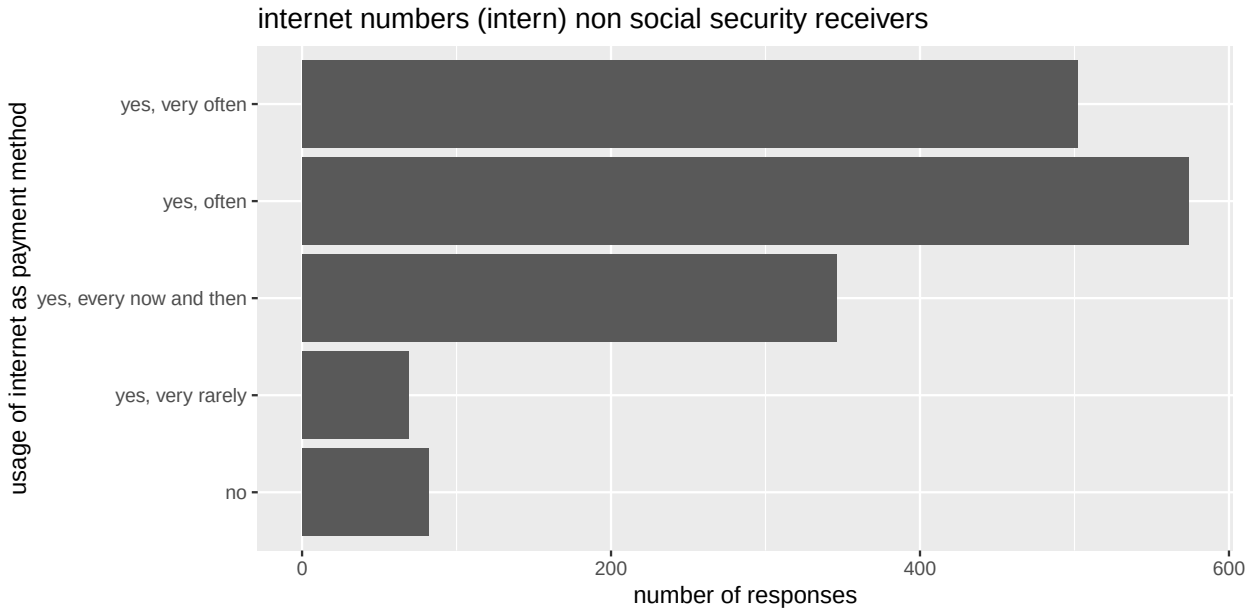

nfc numbers (nfc2) "Zorgtoeslag" social security receivers
usage of nfc as payment method
very often (that is (almost) every day)
often (that is (almost) every week)
every now and then
seldom
never
0
25
50
75
100
number of responses


nfc numbers (nfc2) non social security receivers
usage of nfc as payment method
very often (that is (almost) every day)
often (that is (almost) every week)
every now and then
seldom
never
0
100
200
300
400
number of responses


application numbers (smart) "Zorgtoeslag" social security receivers
usage of application as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
50
100
150
number of responses


application numbers (smart) non social security receivers
usage of application as payment method
yes, very often
yes, often
yes, every now and then
yes, very rarely
no
0
200
400
600
number of responses





People who receive social security in the form of Zorgtoeslag also seem to be more cautious, as they use the three last payment methods less compared to people who do not receive benefits.

What are my plans for the (immediate) future?

I want to finish the data exploration soon, so I can start the actual analysis process. My aim is to finish the analysis completely in the week of May 18th, so I have about a month for the writing process. To get to this point I want to be done with data exploration in a week at most (11th of May). This leaves me with a window of 13 days at most to finish the actual analysis, which I think should be enough.

Issues I am currently having

1. My dataset only contains data on the four payment methods I'm using. Ideally I would also want data on people who prefer to use cash payments. I tried to set up a proxy for this by filtering the dataset by people who use the four payment methods rarely, but this turned out to only be 10 respondents and thus unusable.

2. Some variables which I imagine should influence people's payment method usage turned out not to (or at least the way I used the data didn't show evidence of this). This complicates some of my research, which makes it difficult to reason around. In other words: my first hypothesis needs to have clear evidence of an effect, and if I can't establish this it weakens my whole thesis. I am not sure if showing thorough research would be enough.

3. Since H4 and H5 are based on H1-H3, there is some uncertainty whether these hypotheses need more data analysis. I could also have H1-H3 be the main analytical part of the thesis, and have H4/H5 be a discussion of theory linked to my analytics. Not sure how to approach this.