

A FURTHER VALIDATION OF THE USE OF ACCESS PANEL FOR READERSHIP RESEARCH - THE NPM CASE

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Introduction

Ideally, any audience study should be based on a fully random probability sample. In reality, for cost reasons, the Dutch national readership survey (NOM Print Monitor, NPM) has adopted a mixed mode approach, in which data are collected in both a random probability sample and a sample drawn from an access panel. This approach combines the best of both worlds: the quality of random probability samples and the cost-effectiveness of online access panels.

A recurring discussion is whether the access panel sample has any influence on the reported readership levels, whether this influence is the same for all newspaper and magazine categories and, last but not least, if such an influence can be adjusted by stratification or weighting of the access panel sample. If there is a bias in the access panel and if the NOM approach indeed proves to be successful in eliminating it, this can have positive implications for audience research design and costs in other countries.

Validation of the use of an access panel as a sampling source in 2006 showed a very small effect of access panel versus random probability sample on the readership levels measured, the bigger part being explained by profile differences of the respondents (Petric & Appel, 2007). In 2011, a more in-depth analysis was performed in order to detect possible enhancements to the sampling scheme or the weighting design of the survey data.

Background

In 2006, at the same time as re-designing the readership method from Recent Reading to Specific Issue Readership (Petric & Appel, 2007, Petric & Appel, 2009), a new approach to sampling was developed. In the new NOM survey the respondents are recruited from two sampling sources: a) the Dutch Postal Addresses File, containing all addresses in the Netherlands to which mail is delivered (in effect, all private homes) and b) the Intomart GfK online access panel (a database of approximately 125.000 people).

Following the example of more traditionally panel-based surveys like a TV panel, where it is good practice to run an extensive establishment or enumeration survey, it was decided to expand further on this. As the foundation of the NPM survey, a full random probability sample from the Dutch population is interviewed, taking all possible efforts to achieve a high response rate. This sample is not only used to measure readership, but also as an establishment survey; using the random sample's results, the stratification of the gross online access panel sample as well as the weighting input is calculated. The weighted combination of random probability and online access panel samples is then used for the readership reporting. Figure 1 shows the mixed sample design of the NOM Print Monitor.

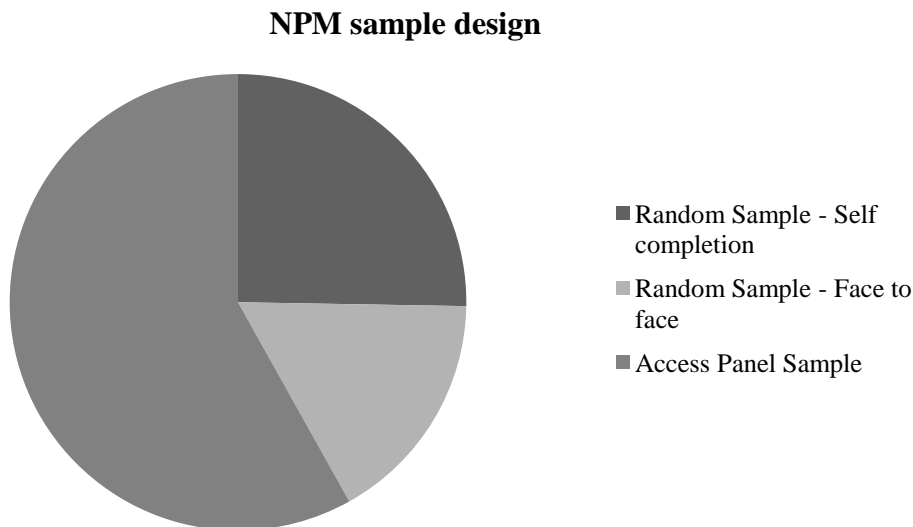


Figure 1: NPM sample design (NPM 2010-II)

Despite of all the advantages of using an access panel as a sample base (Petric, Appel & De Leeuw, 2009), a recurring question stays whether an access panel is a suitable sample base for audience research.

Objective of this paper

In this paper we shall first outline to what extent differences in readership levels are found in the two sampling methods used for NPM and indicate which publication categories and target groups are most affected. The next step is to define the possible underlying variables causing these differences, with the ultimate goal to design solutions in the sampling or the weighting scheme.

Readership levels by sampling method

In order to analyse the possible differences in readership levels we have separated the data into two parts: the data obtained from the respondents recruited in the random probability sample (RPS) and the data obtained from the respondents recruited from the access panel sample (APS). We focused our analysis on the most important metrics in readership research, Average Issue Readership (AIR) and Total Readership (TR, read in the past 12 months), which we summed up (gross figures) as an

indication of the results for different samples. The data concern the fieldwork for NPM 2010-II, 6 months of data, consisting of n=11.048 interviews, of which n=10.544 belong to the internet population.

If we look at the number of titles claimed in total readership (TR) we see a small difference between the two samples; the access panel sample shows a somewhat lower number of titles for total readership (see Figure 2). The same can be observed in the number of titles in the Average Issue Readership (AIR), see Figure 3.

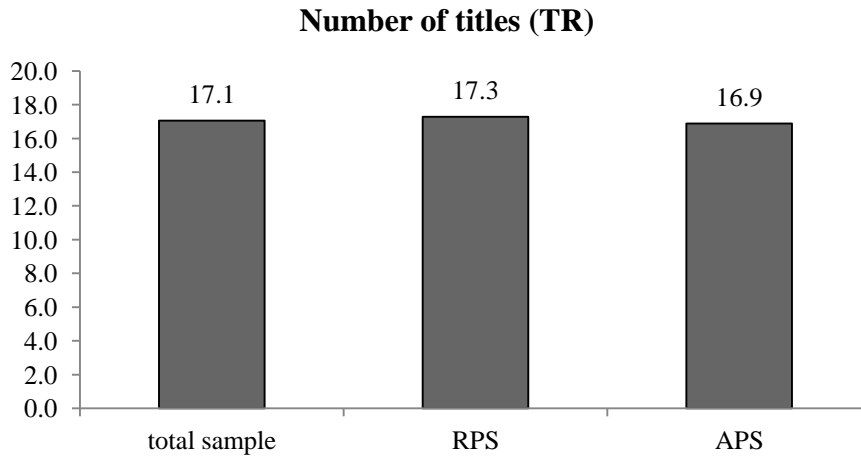


Figure 2: number of titles TR by sample type, NPM 2010-II

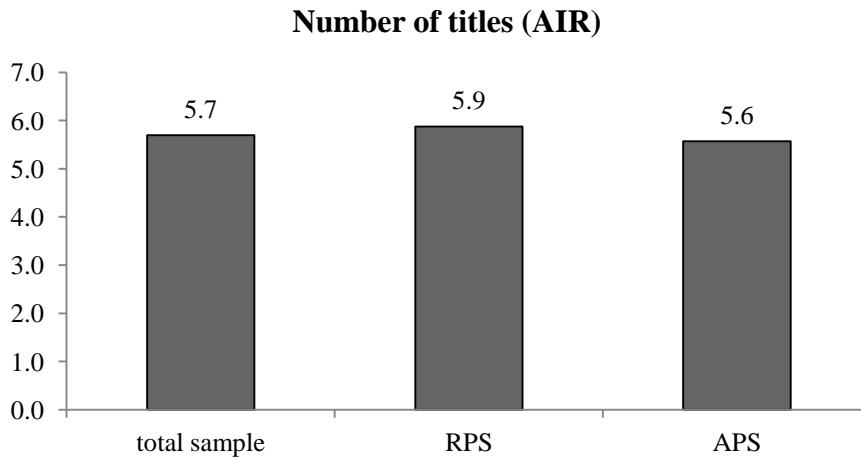


Figure 3: number of titles AIR by sample type, NPM 2010-II

This comparison, however, is not correct, as only the internet part of the random probability sample should be compared to the access panel sample. In order to get comparable samples the part of the random probability sample that has access to internet (i.e. internet population) was isolated; then both this sample and the access panel sample were weighted with the same matrix of socio-demographic variables. In this way two completely comparable samples are obtained.

Figures 4 and 5 show the number of titles in TR and the number of titles in AIR for these two samples for internet population only. As can be seen, the differences get somewhat bigger: access panel sample produces a lower number of titles in total readership and in AIR.

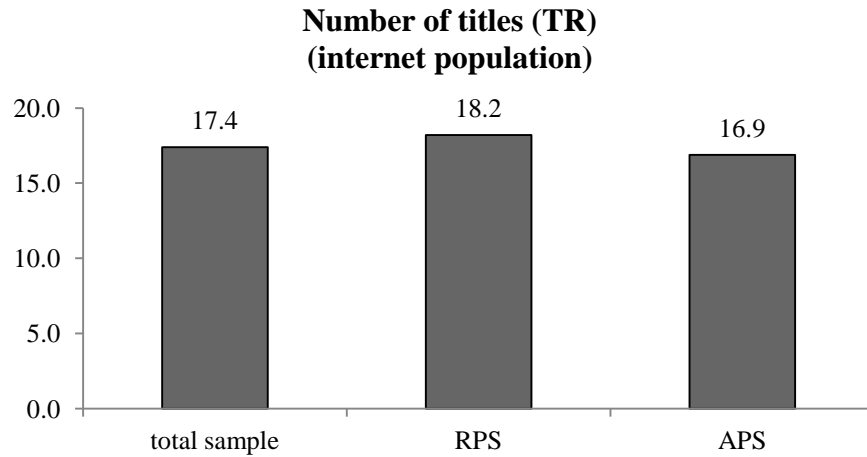


Figure 4: number of titles TR, internet population

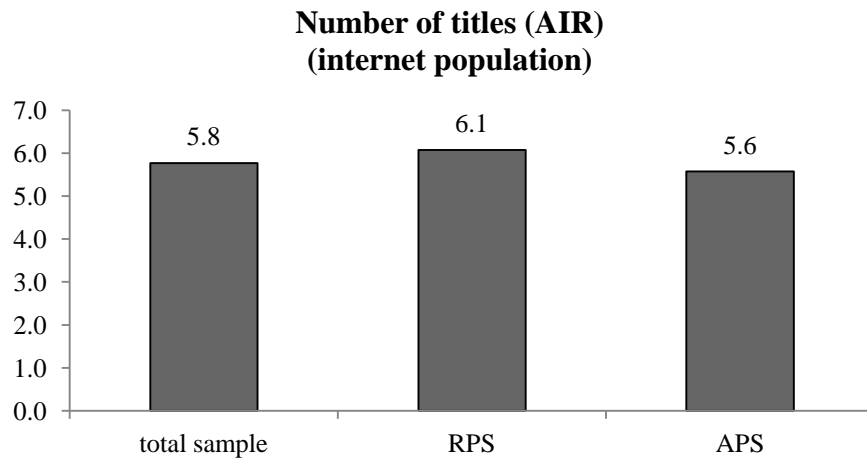


Figure 5: number of titles AIR, internet population

The differences between the two samples are especially visible for magazines; newspapers show only a small difference in the number of titles in TR, but not in AIR.

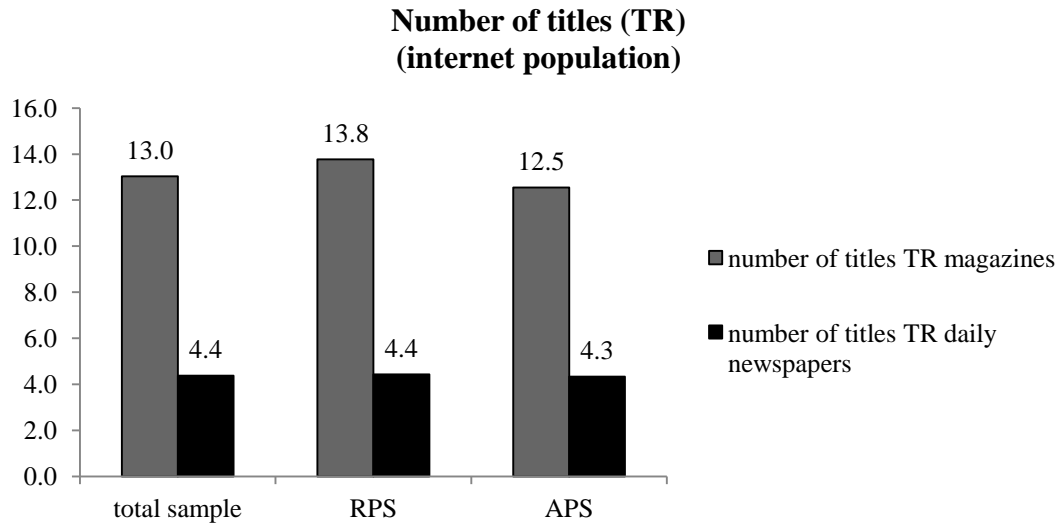


Figure 6: number of titles TR newspapers / magazines

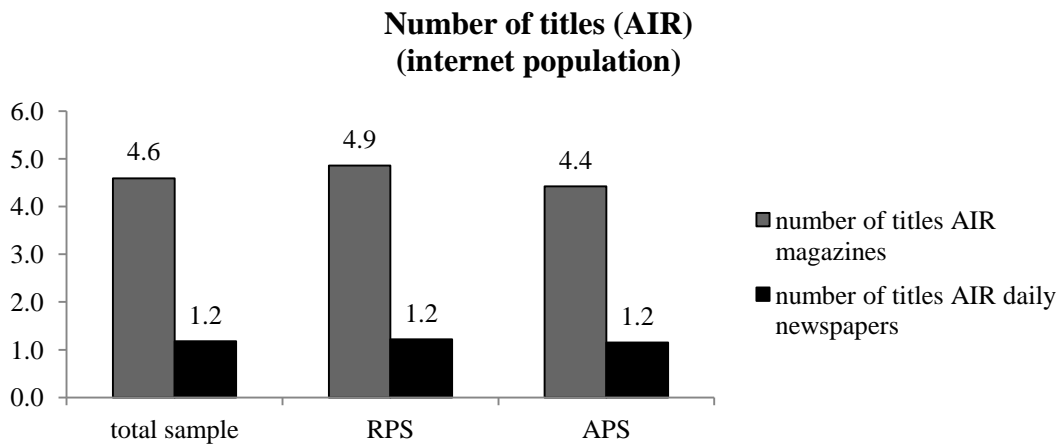


Figure 7: number of titles AIR, newspapers / magazines

If we look somewhat deeper into the groups of newspapers and magazines then we see different effects in different groups. In the group of newspapers there is a small effect in the total readership for national and regional dailies; however, there is no difference in results in AIR for these two categories. Free newspapers show the effect of lower readership levels in the access panel sample for AIR.

Magazines show bigger differences in readership between the two samples. The biggest differences in results are seen in the category of home and garden magazines.

We have also looked at the results for a number of different target groups. There are three target groups that show significant difference in results between random probability sample and access panel sample: age 20-34, middle education group and age 65 and older. The last group is an exception: readership levels in this group are higher in the access panel sample than in the random probability sample, whereas in the other groups, readership is lower in the access panel sample.

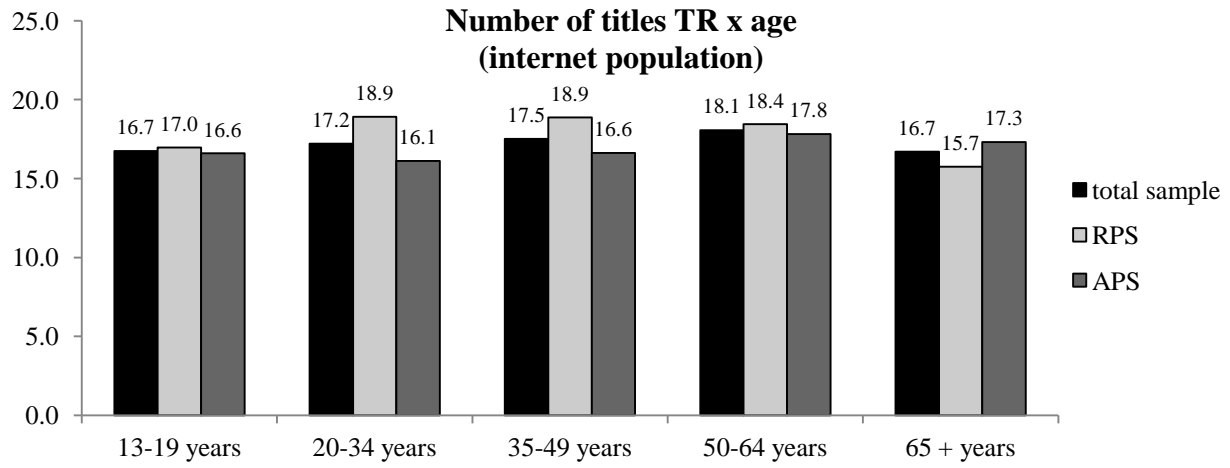


Figure 8: Number of titles TR by age

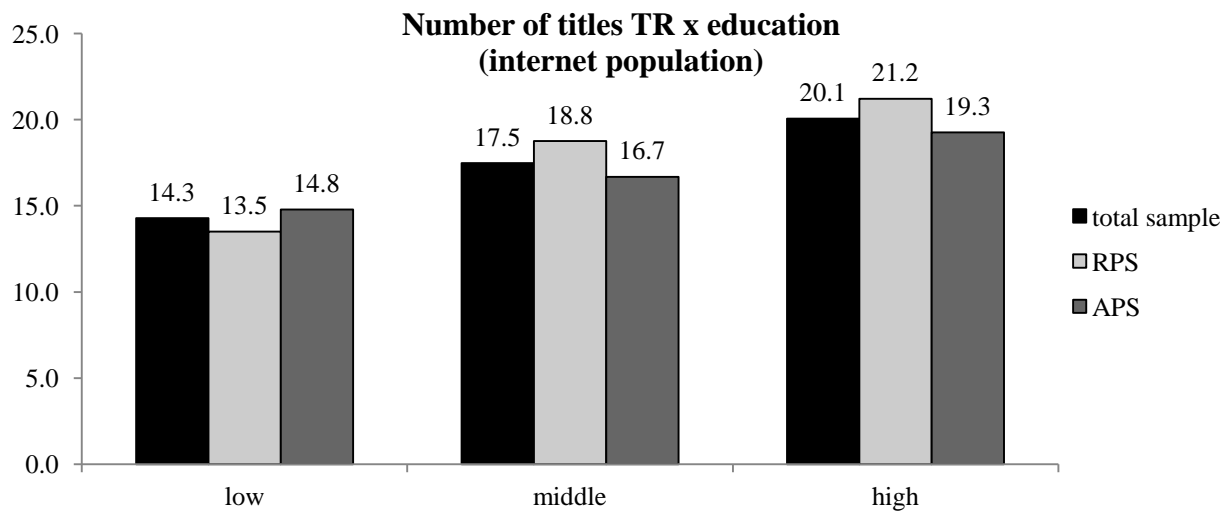


Figure 9: Number of titles TR by education

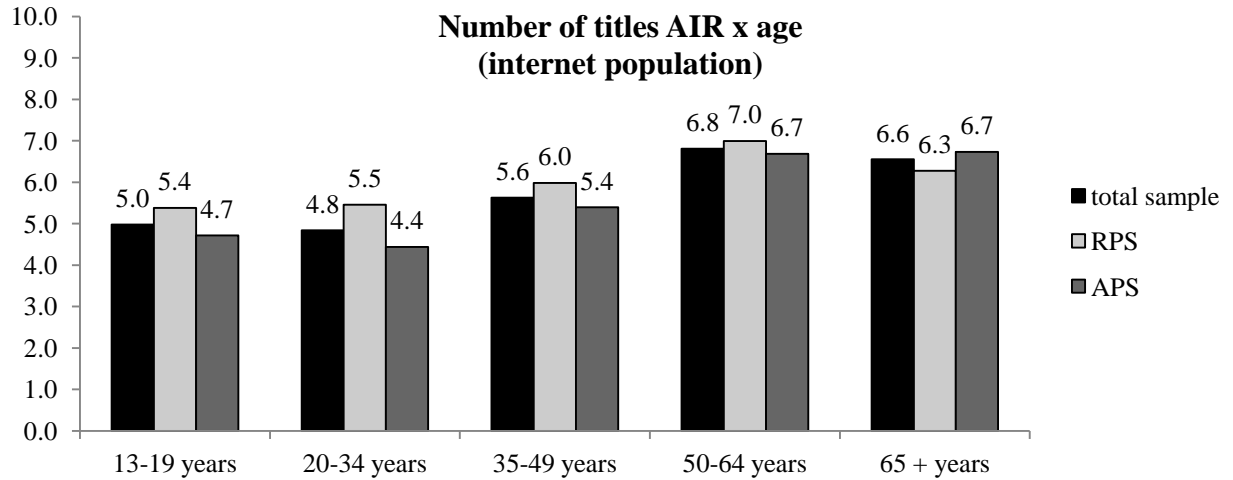


Figure 10: Number of titles AIR by age

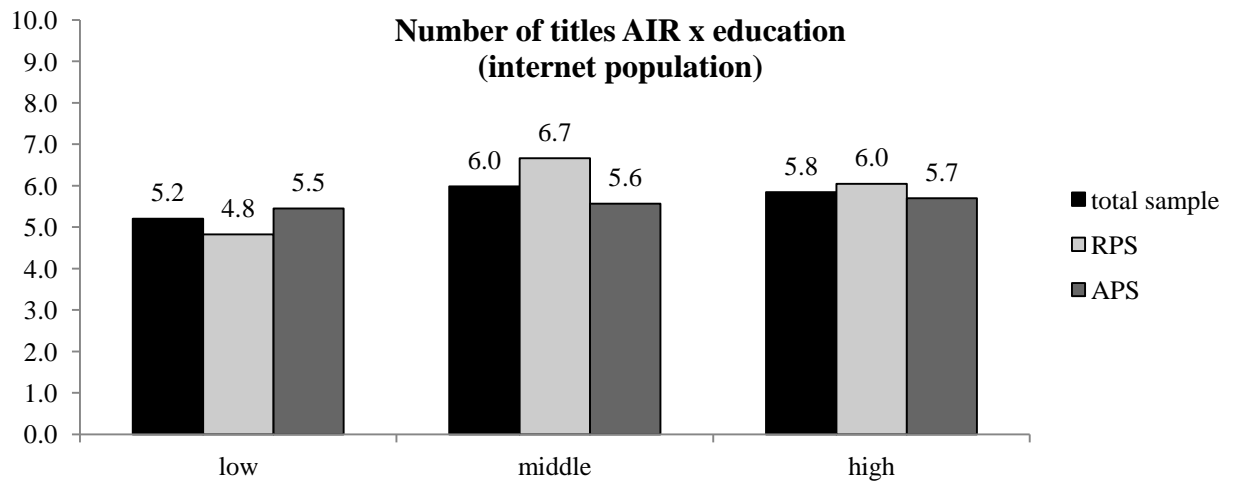


Figure 11: Number of titles AIR by education

A very well known bias in the access panel sample is experience and usage of internet; respondents in access panels are usually more experienced and more frequent users of internet. Although we use the frequency of usage of internet as weighting variable in the NPM, we have nevertheless compared the two samples for their usage of internet. We have split the samples into three groups according to the amount of time respondents spend surfing per week: low usage (up to two hours per week), middle usage (from 2 to 4 hours per week) and high usage (more than 4 hours per week). Figure 12 and 13 show the number of titles in TR and AIR for the three internet usage groups.

It is obvious that the people in the lower usage category of the internet, also read less; middle and high usage groups of internet do not show a clear relation to reading.

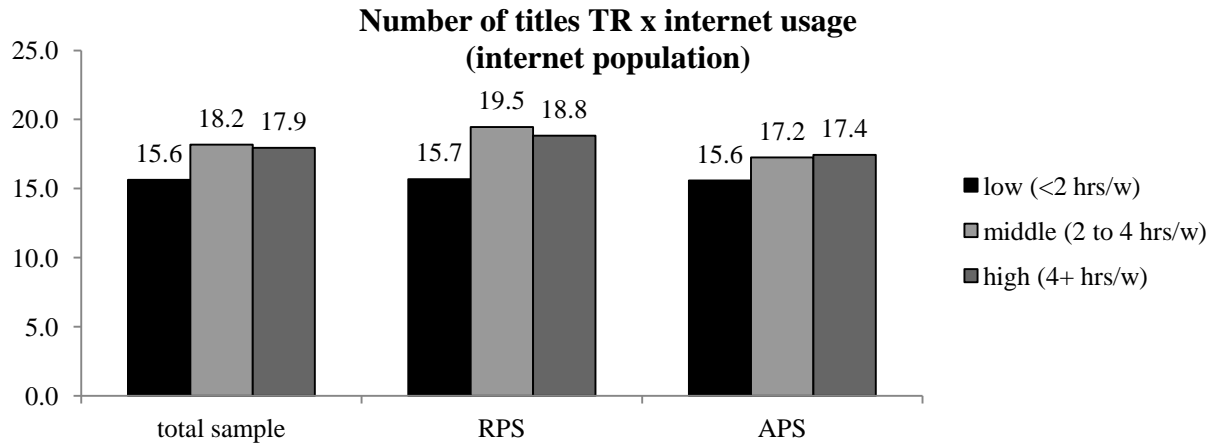


Figure 12: number of titles TR by internet usage

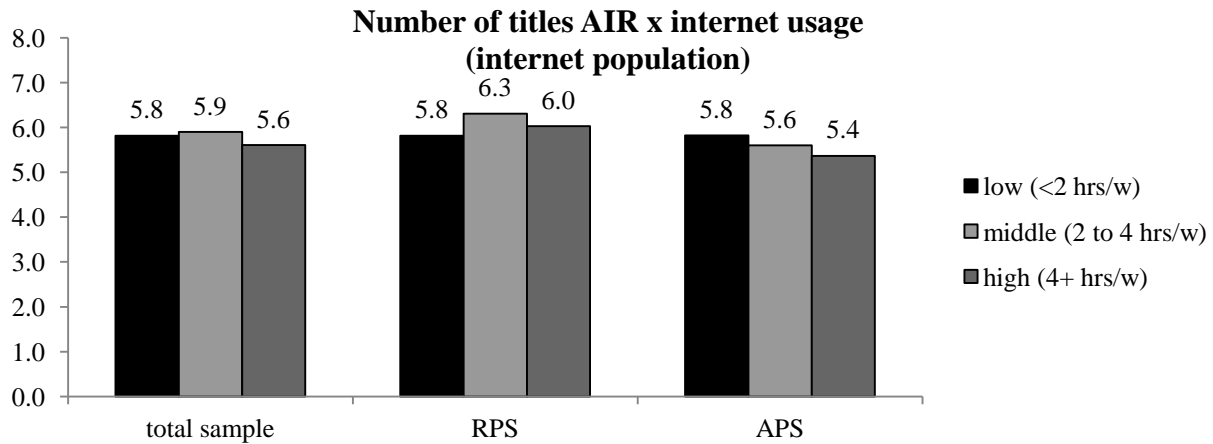


Figure 13: number of titles AIR by internet usage

We also looked at the relation between reading and usage of other media like TV and radio. Here we have also split the samples into three groups according to the amount of time respondents spend watching TV and listening to the radio per week: low usage, middle usage and high usage. Figures 14 to 17 show the number of titles in TR and AIR for the three usage groups for TV and radio.

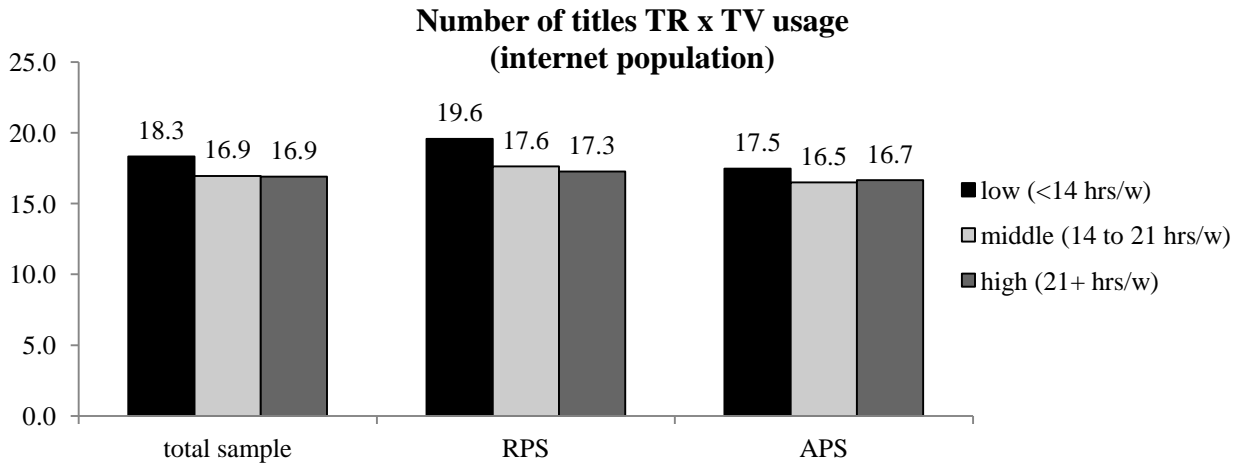


Figure 14: number of titles TR by TV usage

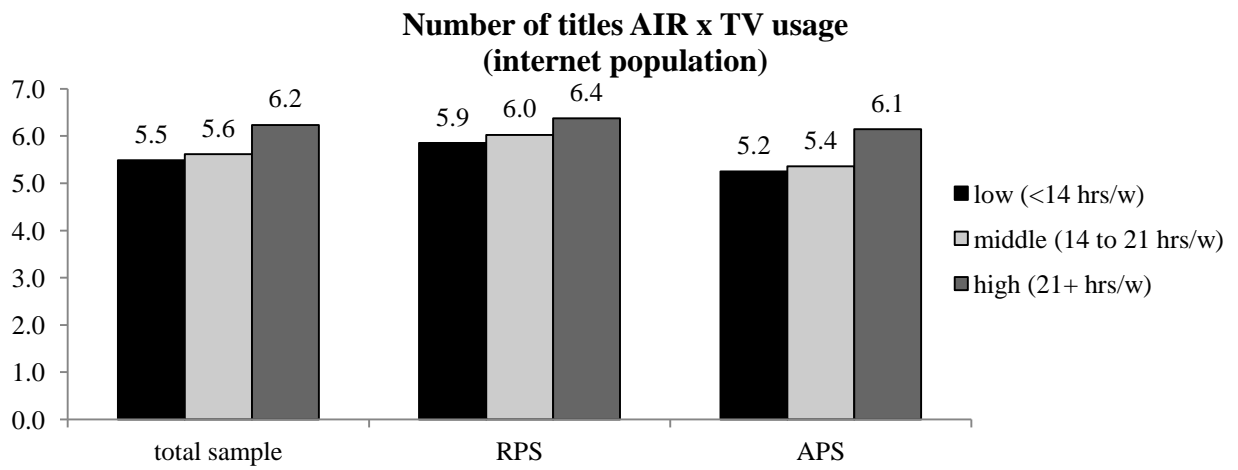


Figure 15: number of titles AIR by TV usage

We see a clear relation between the time spent on TV and the number of AIR titles. The same can be observed for radio.

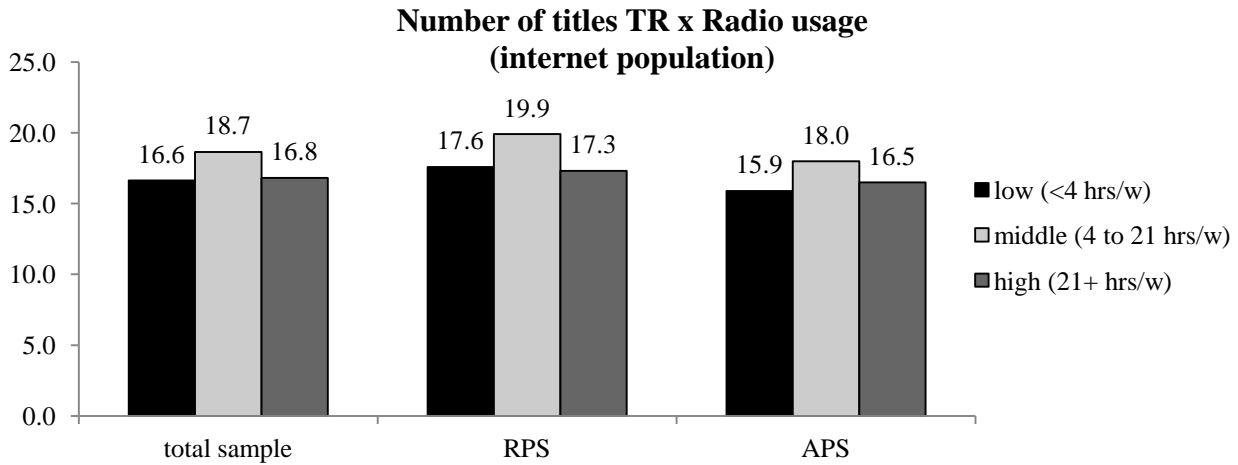


Figure 16: number of titles TR by radio usage

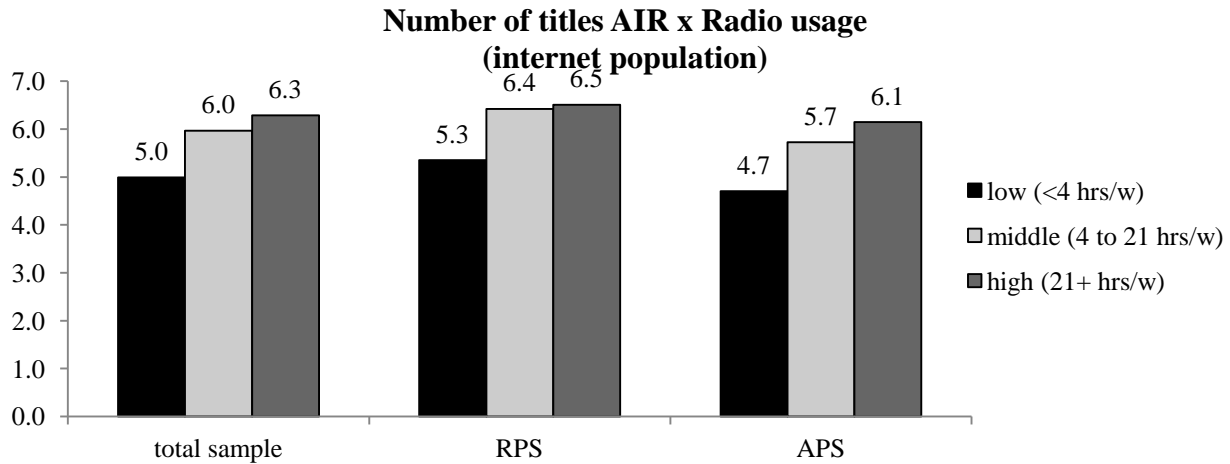


Figure 17: number of titles AIR by radio usage

Finally, we also looked at the profile of respondents in random probability sample vs. access panel sample in terms of different level of activities they engage in; this says something about their lifestyle. For this we divided the respondents in three groups, according to the number of activities they claim to be doing regularly, out of a list of 55 activities ranging from going out to concerts, visit disco's, to playing games or a musical instrument. In Figure 18 and 19 we can see that the more people do (the more active they are), the more they read.

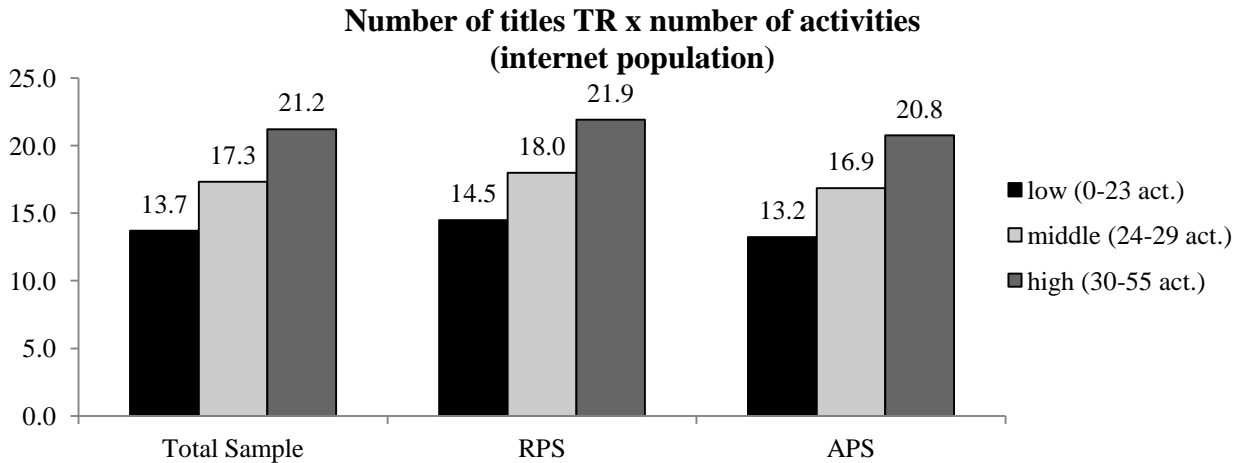


Figure 18: number of titles TR by number of activities

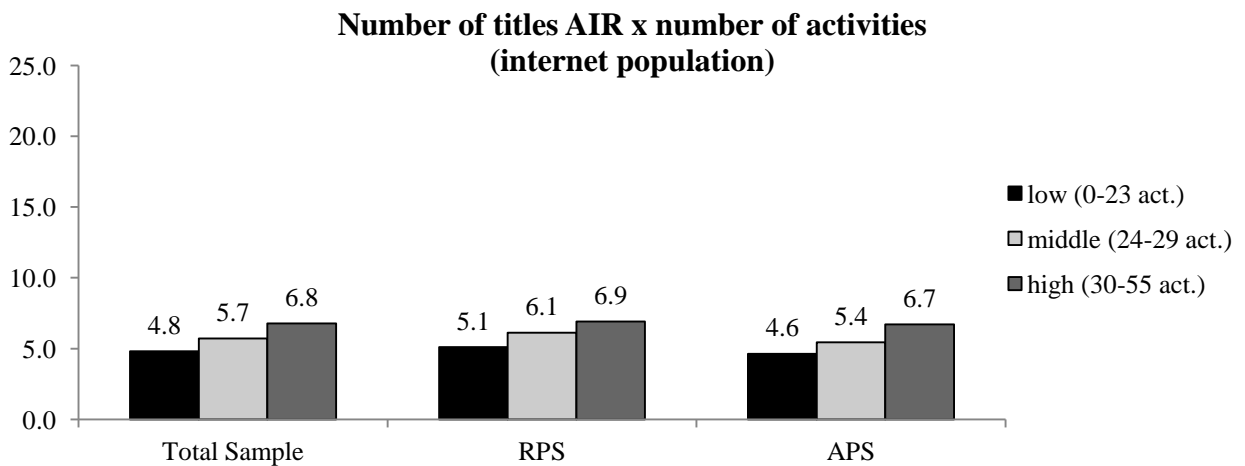


Figure 19: number of titles AIR by number of activities

How to explain differences in readership levels?

In fact, we were not surprised to find differences in results between the two sampling frames. We know that people who are a member of access panels have a different profile than people in a random probability sample. They are generally younger, have somewhat higher education, are more internet savvy etc.. This is bound to lead to differences in readership levels, which we anticipate and try to minimise by stratifying the sample from the access panel based on known characteristics of the panellists (like gender, age and internet usage).

The question was whether we can find other factors which can explain the differences in readership levels and can be used to optimize the sample composition in the future.

We performed a regression analysis (OLS) to distinguish the importance of the different variables in relation to the dependent variable: number of titles read in past 12 months (total readership=TR).

The following groups of variables were included in the analysis:

- Socio-demographic variables
- Lifestyle variables (55 activities from the Target Group Survey)
- Internet variables (internet access at home, frequency of usage at home or elsewhere, number of activities on internet)
- Other media usage (TV and radio usage)
- Experience with NPM survey (number of times participated in the NPM survey)

For the list of included variables in the analysis see Appendix 1.

Explanation of titles read

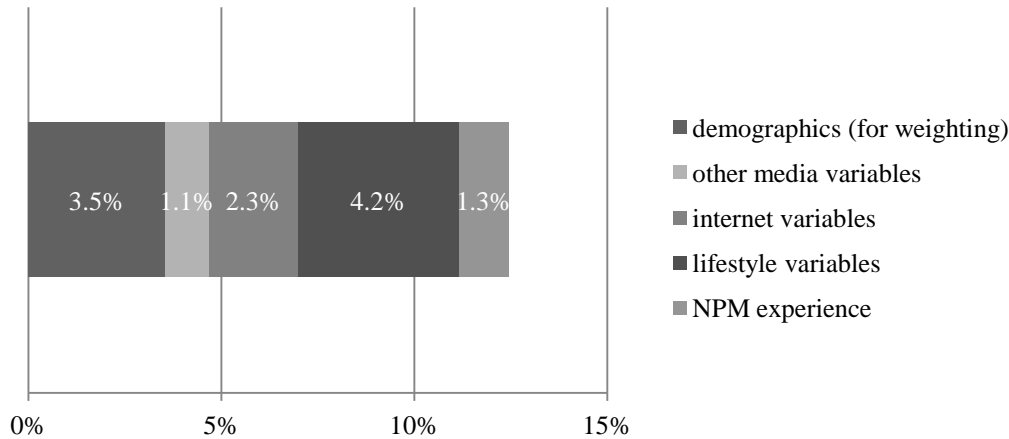


Figure 20: Adjusted R-square of model including NPM experience. Access Panel Sample, 2010-II.

The initial model where we included demographic, lifestyle and media variables of the respondents, combined with the number of times they previously completed NPM, explains less than 13% of variation in the number of titles read in the past 12 months ($F(27,3496)=19,545, p<.001$). In previous studies we had the same experience. This means that it is difficult to explain differences in readership even though we included a large number of variables.

In the initial model we find that the larger part of the explanation of the differences in readership comes from socio-demographic variables and other lifestyle variables. Usage of other media, such as TV and radio, only play a minor role. From the other characteristics we included, experience with NPM survey also shows up and explains a small part of total variance (1,3%, Pearson correlation between NPM experience and TR is $-.154$ ($p\text{-value}<.001$)).

Several of the variables we have used in the analysis are included in the weighting matrix of NPM. So next to the stratification of the sample from the access panel, which is done in advance, we further expect to correct the remaining skew of the access panel by means of the extensive NPM weighting scheme.

The weighting variables of the total NPM samples are:

- Household size (4 categories)
- Household size x position in household (6 categories)
- Education (7 categories)
- Gender x age (10 categories)
- Region (5 categories)
- Urbanisation level (5 categories)
- Sub-regions (50 categories)
- Detailed age groups (15 categories)
- Age of youngest person in hh (8 categories)

- Access to internet at home (2 categories)
- Internet usage frequency at home x age (9 categories)
- Internet usage frequency at home x gender (6 categories)

The weighting on frequency of usage of the internet is especially important when using access panel respondents, as we are aware that access panel members are more likely to be frequent users of the internet.

As was shown, differences in readership remained after weighting, even when focussing on the internet population within the random sample. Usage of other media (like TV and radio) cannot serve as weighting variable. The same goes for lifestyle variables that are a major factor in explaining readership (4,2% of total variance), but cannot be easily used for stratification or weighting. This leaves experience with NPM survey as a possible approach for optimization of the access panel. Do we need to change the rules for re-inviting panelists for participation in NPM, or do we need to examine other panel characteristics? The question is which approach is has the most chance of success and is practical at the same time.

Experience with NPM survey

NPM is a relatively long questionnaire that takes an average panellist about 35 minutes to complete. The incentive paid is not dependent on the actual time spent, but is fixed and communicated beforehand. A panellist might be tempted to follow a strategy to shorten the completion time if he is aware of the structure of the questionnaire because of a previous participation. If he recognises the filter question (a list of more than 160 titles – read in past 12 months), he might know that the answer “yes” will lead to additional questions about the title. Re-contacting respondents for another participation in NPM is therefore restricted: only after one year will we re-invite the same person to participate in the survey again.

As we want to draw a representative sample from the access panel, there is a certain necessity to re-invite respondents who have completed the NPM questionnaire in the past. Certain profiles are less well represented in the access panel than others. These panel members in specific cells will therefore be invited more often than others. These are often groups that are less active on the internet. Combined with specific profiles (less active people in younger age groups), they are very hard to find in real life, and similarly scarce in the access panel.

The hypothesis we formulated is the following: Participating more than once in the NPM survey leads to a learning effect; in the second or third interview respondents are likely to tick less boxes in the total readership question, thereby lowering the number of titles read and thus anticipating a quicker completion of the questionnaire.

This leads to our question: how does the number of titles read in the past 12 months correlate with the number of times a respondent participated previously in NPM?

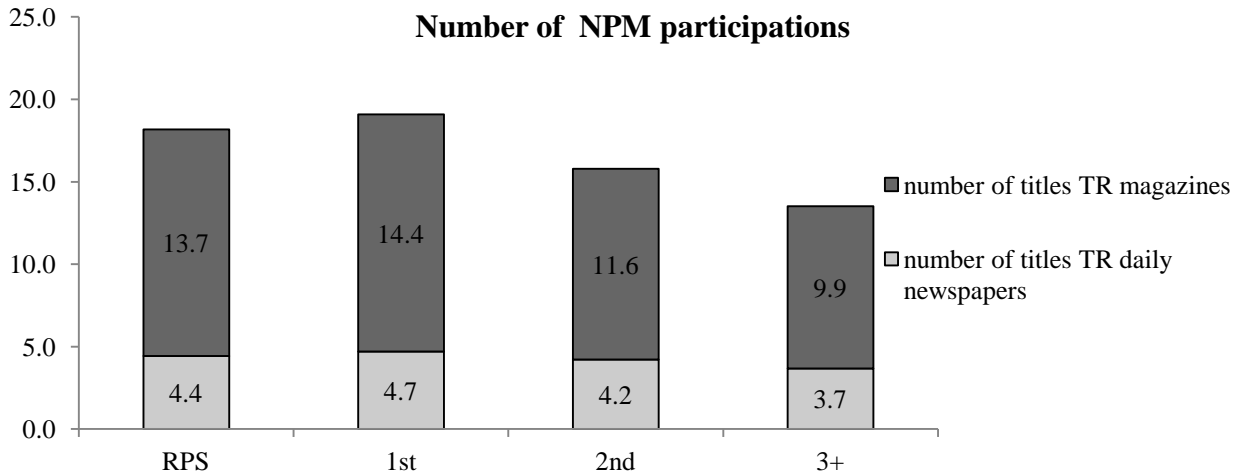


Figure 21: Average number of titles read by number of previous NPM participations by the same person. Access Panel Sample, 2010-II.

Indeed, a significantly lower number of magazines is entered by respondents who complete the questionnaire for a 2nd or a 3rd time. As using these respondents more than once cannot be totally discarded, we analysed whether this effect would decrease when a longer interval between interviews would be taken into account.

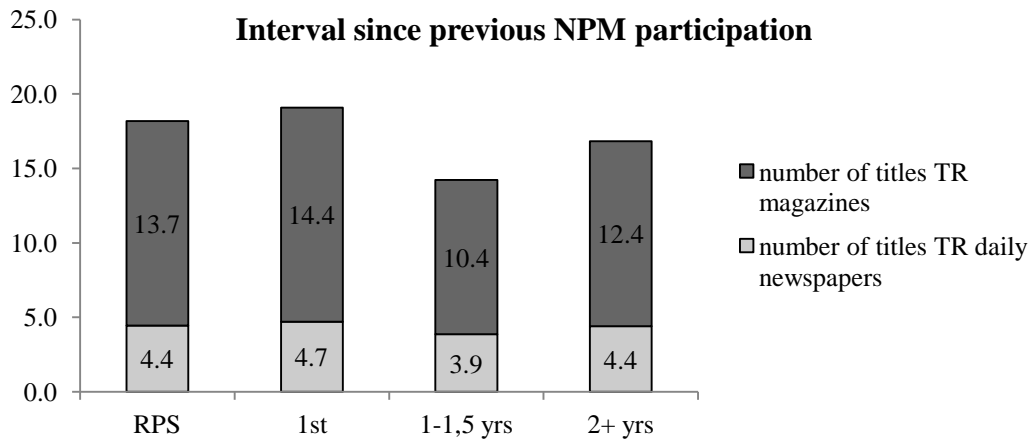


Figure 22: Average number of titles read by waiting interval since last NPM participation. Access Panel Sample, 2010-II.

Figures 21 and 22 seem to show a learning effect if a respondent is invited again within 1 – 1,5 years after the first NPM survey, while waiting with the invitation for a longer period of time, neutralizes this effect. Pearson correlation # titles x # intervals = 0,051 (p-value<.001).

This finding might lead us to a possible direction of solving the problem: wait longer before re-inviting the same person to participate in the same survey.

However, this finding also needs to be somewhat corrected. The skew in the results is in fact partly caused by the different profile of the re-interviewed group after 1 – 1,5 years: these are mostly lower educated people. This group on average reads less, so the lower results are to be expected.

Checking this assumption in the data shows that the drop in the number of titles read is much less when we look at lower educated people specifically, even when they are re-invited within 1,5 years after their previous participation.

Number of titles TR x interval since previous NPM participation (lower education)

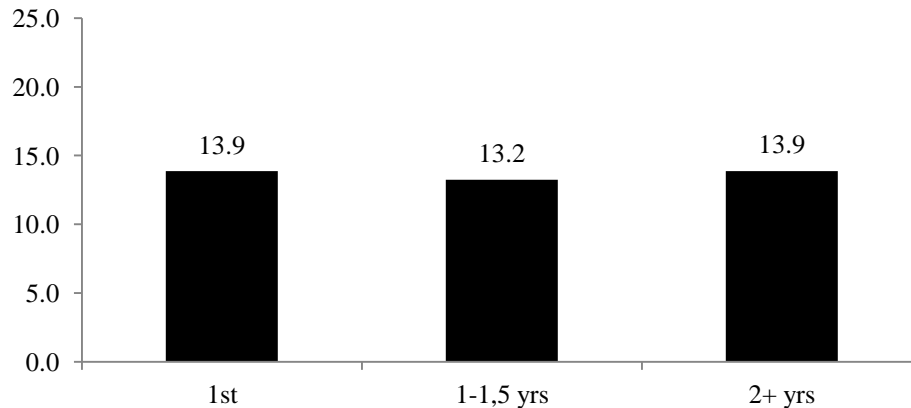


Figure 23: Number of titles read by respondents with lower education by interval since previous NPM participation. Access Panel Sample, 2010-II.

Even though we found that the experience a panelist has with the NPM questionnaire correlates negatively with the number of titles read, this does not lead us to a clear decision on the approach to be taken. Not inviting people for another participation in NPM, or extending the interval between two invitations, may not lead to the anticipated effect because the majority of re-contacted panelists belong to lower educated segments within the panel. The lower readership levels they produce are anticipated and logical.

Panel membership variables

The analyses left us with a problem: re-inviting respondents is obviously inherent to the use of access panel members for NPM, even if we have 125.000 members available and refresh on average 35% of the panel annually. Some member characteristics are over-represented in a panel, but others are only available to a certain extent, so we are obliged to ask scarce panellists to complete more interviews than others. In the previous analyses we found that these groups do not really cause the lower TR figures.

The learning effect we did not find in the groups with lower readership, might however still exist. Even though there is no indication that the learning effect is caused directly by NPM participation, it might be visible if we look at the duration of peoples panel membership.

On average an Intomart GfK access panel member participates in 2 questionnaires per month, ranging from advertising tracking to strategic studies for the Dutch government. Younger people (20-49) as well as lower educated people are interviewed on average 2.1 times per month. Obviously, there are exceptions in more granular profiles, where individual respondents might get up to 6 invitations per month.

We formulated an additional hypothesis: “Duration of panel membership and panel pressure (the number of interviews in the past 6 months) generate lower levels of total readership in NPM because of learning effects”.

We again analysed the number of titles in TR using the previously used variables, but now also adding panel membership variables, such as the number of years in the panel and the number of completed questionnaires.

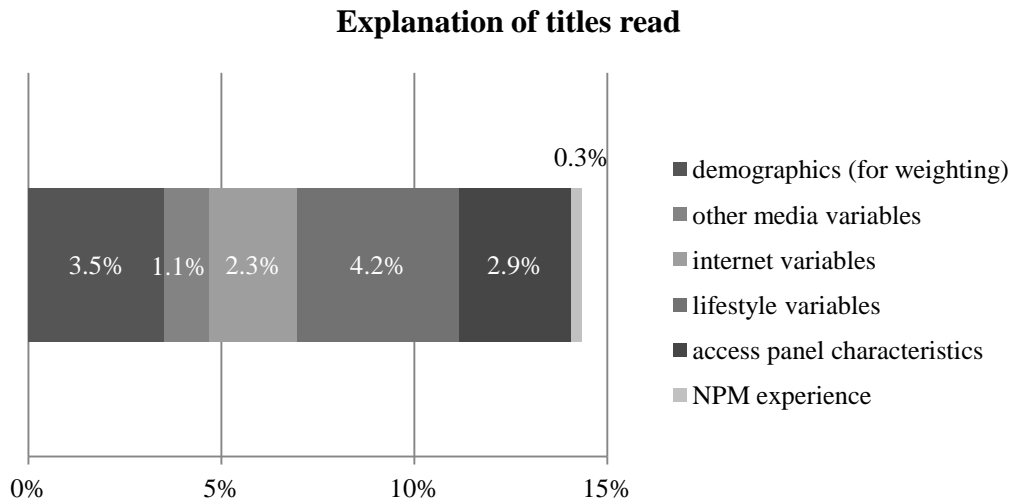


Figure 24: Adjusted R-squared of model including Access panel characteristics and NPM experience. Access Panel Sample, 2010-II.

The regression model is significant ($F(31,3450)=19.810$, $p<.001$) and adjusted R-squared is 14,3% in total. Panel variables do come up as an important factor, adding 2,9% of explained variance to the model.

If we analyse further, the factor Panel pressure comes up, i.e. the number of participations in the past 6 months. This variable can partly be discarded because it suffers from the same effect as experience with NPM survey: the need to re-contact a certain respondent correlates with a lower reading behaviour.

The other panel membership related factor is duration of panel membership. On average the number of titles read in the past 12 months declines from almost 20 among new panelists to 15 among panelists who have been a member for 6 years or longer.

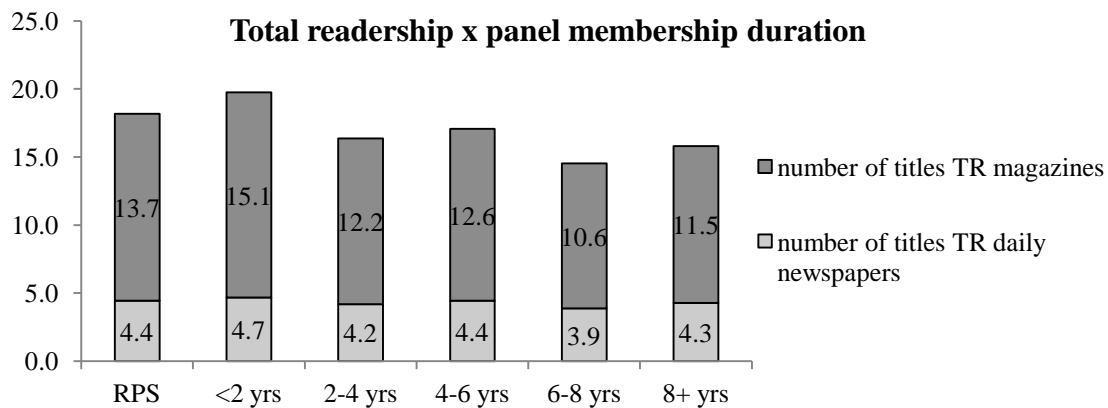


Figure 25: Number of titles in TR by panel membership duration. Access Panel Sample, 2010-II.

Again, we need to examine the profiles of these respondents, since certain groups tend to stay on longer in an access panel, while others leave after a shorter period of time and constantly need to be newly recruited. Pearson correlation # titles x # years in panel = -0.116 ($p\text{-value}<.001$).

Education x panel membership duration

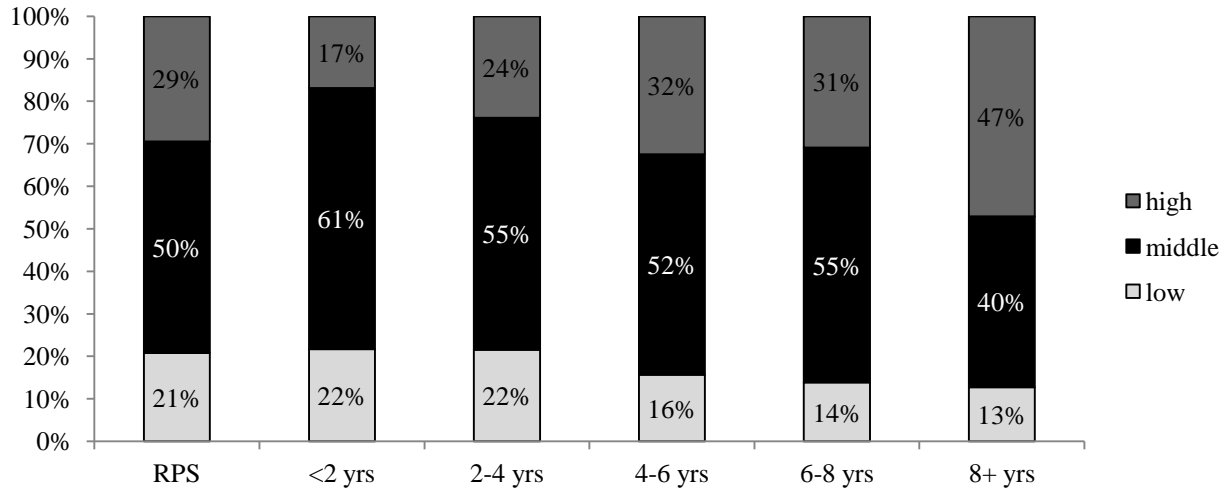


Figure 26: Profile of panel duration cohorts within Access Panel:education. Access Panel Sample, 2010-II.

The profiles of people who stay longer on the panel do explain some of the variance. The longer people are on the panel, the higher their average level of education. The direct effect on the number of titles read in the past 12 months should be positive. However, the Pearson correlation # titles x # years in panel, corrected for education = -0.141 (p-value<.001), shows in fact a stronger negative effect than without the correction.

Age x panel membership duration

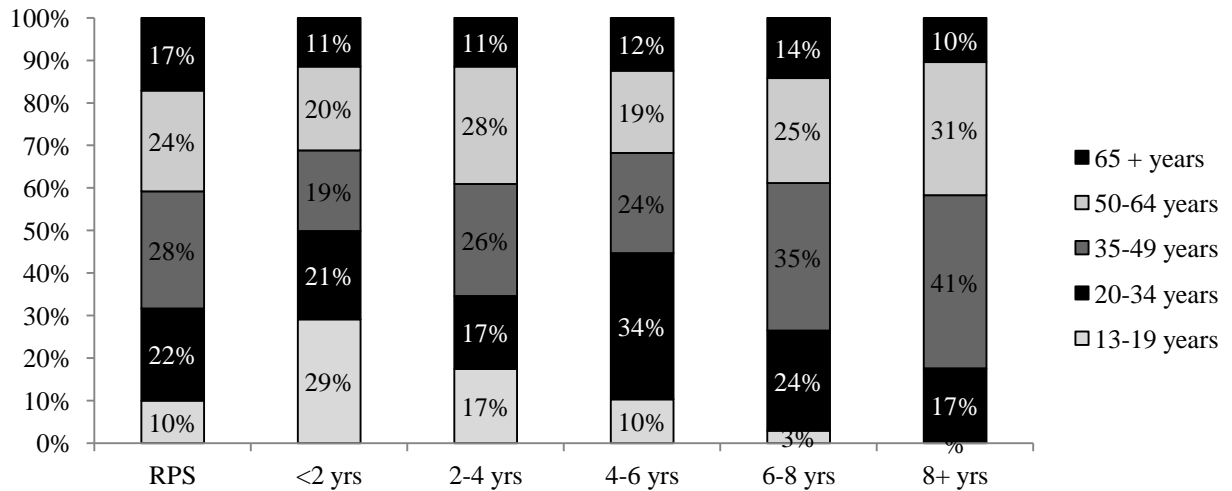


Figure 27: Profile of panel duration cohorts within Access Panel: age of respondent. Access Panel Sample, 2010-II.

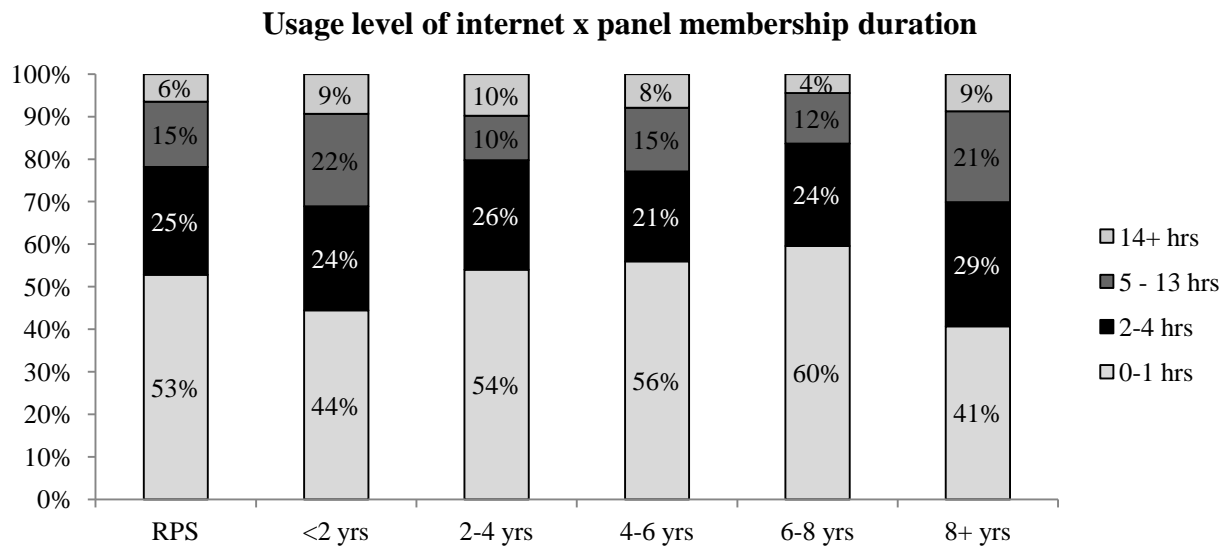


Figure 28: Profile of panel duration cohorts within Access Panel: usage of internet. Access Panel Sample, 2010-II.

The respondents who stay longer in the access panel, tend to be between 35 and 64 years of age. Younger respondents move to older age categories automatically so panel duration of 8 years or longer is theoretically almost impossible. Within the dominant age groups, one would expect higher readership than average. Combined with panel membership duration, however, we find lower readership, which is counter-intuitive.

Also, respondents who stay longer in an access panel tend to be more frequent users of the internet. The effect on the number of titles read in the past 12 months is expected to be positive: higher internet frequency has a positive correlation with the number of titles read. Pearson correlation # titles x # years in panel, corrected for hours internet at home = .025 (p-value=.005).

In fact, we find that people aged 34-49 with higher education are overrepresented in the cohort of 6 years + in the panel.

The group is expected to show higher readership figures than average. The fact that we do not actually find this, leads to the conclusion that higher educated people who remain longer on the panel have a tendency to under-claim readership. We think this is the result of a learning effect of completing online questionnaires in general.

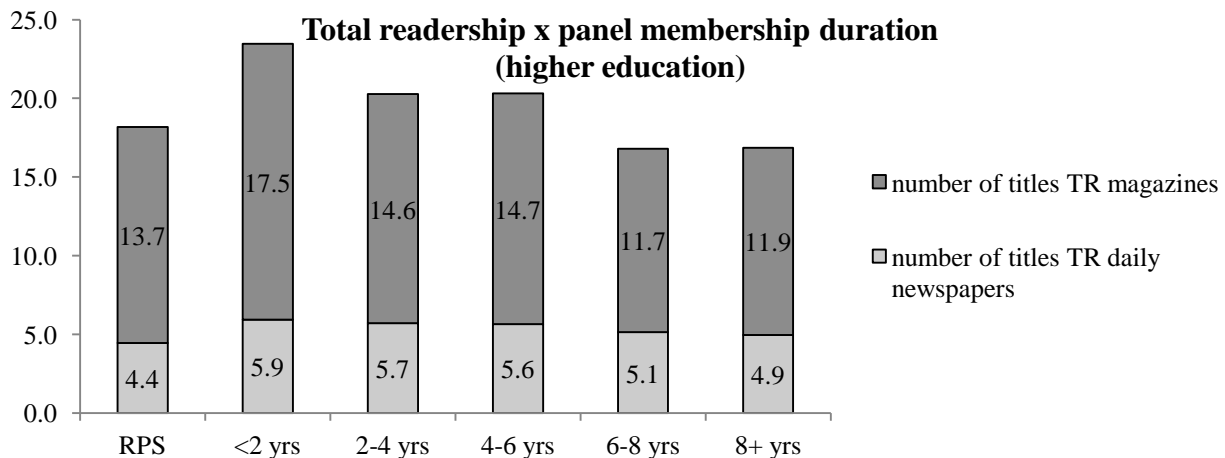


Figure 29: Number of titles read by higher education, by panel duration. Access Panel Sample, 2010-II.

Conclusions

Yes, using access panel as a sampling base for readership survey is not without problems. We find that the access panel members differ from the internet users in the random probability sample in more aspects than can be corrected by means of sampling corrections or weighting.

Differences in respondents' socio-demographic and lifestyle profiles are important factors, but do not explain the full variance: there are other aspects as well. Partly the fact of being an access panel member in the first place has an influence on the readership results. These people are e.g. more active than other people in the same age groups.

However, against our expectation, we found a somewhat lower number of titles read in the access panel sample, compared to the internet users within the random probability sample. We therefore examined the possibility of learning effects with panelists who are invited to participate in NPM for a second time.

We analysed the influence of participating in the NPM survey more than once after a certain period of time. Even though the time interval comes up in the analysis, this correlation is mostly explained by the profile of the respondents: the fact is that people who are less available on the panel, read less! This is explained by the fact that they belong to a lower educated group, who tend to participate less in online access panels, as well as read less newspapers and magazines.

A second reason for learning effects is the panel membership duration in general: a panelist recognizes a filter question and might choose to under-claim as a strategy to minimize the amount of time needed for completing the questionnaire. How long a person is actually in the access panel, the panel membership duration, does have a significant effect. These people have a slightly different profile; so over time we find an over-representation of higher educated people in the age of 35-64 who have been on the panel for a longer period of time and tend to under-claim their readership in the 12 month filter question with a view to limiting the completion time of the interview.

With these findings we will look into the instruments we can apply to adjust the sampling or the weighting scheme, in order to neutralize these effects. We intend to examine options like stratifying the sample by panel membership duration and the possibility of specific weighting for panel duration afterwards.

Good panel management is thus a very important factor when using access panels as a sampling base for readership surveys.

Appendix 1: variables used in multivariate analysis

Dependent variable

Total number of titles read in the past 12 months (total readership)

Demographics

Region

Education respondent

Age youngest child in household

Urbanisation level (urban / regional areas)

Gender respondent

Age respondent

Position in household

Household size

Media variables

Usage frequency radio

Usage frequency TV

Usage frequency outdoor

Internet variables

Number of hours per week surfing at home

Number of hours per week surfing elsewhere

Internet access at home

Number of activities on internet

Life style variables

Interest in science and technology

Interest in money, politics and economy

Interests in art and culture

Interests in life style

Number of activities performed regularly (out of 55 activities)

Access panel characteristics

Number of years in access panel

Number of times participated in surveys in the last 6 months

NPM experience

Time expired after previous participation in NPM

Number of times participated in NPM

References

- Baim, Julian, Martin Frankel, Mical Galin, Joseph Agresti and Kerry Zarnitz. “Measuring Issue Specific Audiences”. Paper presented at the Worldwide Readership Research Symposium, Vienna, Austria: 2007.
- Faasse, John and Leendert van Meerem. “What the World Needs Now”. Paper presented at the Worldwide Readership Research Symposium, Cambridge, MA: 2003
- Frankel, Martin, Julia Baim, Michal Galin, and Joseph Agresti. “Issue Specific Estimation – Mathematical and Statistical Issues, Procedures and Models”. Paper presented at the Worldwide Readership Research Symposium, Vienna, Austria: 2007.
- Klein, Caryn, Lori Jacobs, Alan Rovitzky, Micah Galin, Julian Baim and Marty Frankel. “Issue Specific Audience: Perspectives on Application”. Paper presented at the Worldwide Readership Research Symposium, Vienna, Austria: 2007.
- Petric, Irena and Marion Appel. “The Readership Currency: Dutch Design”. Paper presented at the Worldwide Readership Research Symposium, Vienna, Austria: 2007.
- Van Meerem, Leendert. “Specific Issue Readership Measurement, Part II”. Paper presented at the Worldwide Readership Research Symposium, Prague, Czech Republic: 2005
- Petric, Irena and Marion Appel. “New learnings from Specific Issue Readership: accumulation of readership and calculation of Average Issue Readership”. Paper presented at the Worldwide Readership Research Symposium, Valencia, Spain: 2009.
- Petric, Irena, Marion Appel and Edith de Leeuw. “On-line interviewing through access panel: quantity and quality assurance”. Paper presented at the Worldwide Readership Research Symposium, Valencia, Spain: 2009.