State-of-the-art of incentive strategies – Implications for longitudinal travel surveys

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Samenvatting

De laatste jaren is er een afname te zien in de bereidheid van respondenten om deel te nemen aan vragenlijstonderzoek. Het verstrekken van incentives is een van de manieren om de hoeveelheid non-respons te verminderen. Een incentive is een beloning die aan de respondenten wordt gegeven om hun deelname te stimuleren. Hierbij kan een onderscheid gemaakt worden tussen verschillende typen incentives, namelijk conditionele vs. onconditionele incentives, monetaire vs. niet-monetaire incentives en loterijen.

Gezien het herhalende karakter van longitudinaal onderzoek en de daarmee gepaard gaande respondentenbelasting wordt hierbij vaak gebruik gemaakt van incentives. Echter is veel van het onderzoek dat uitgevoerd is naar de effectiviteit van incentives gebaseerd op cross-sectioneel onderzoek. Gezien de methodologische verschillen tussen longitudinaal en cross-sectioneel onderzoek is het de vraag of deze resultaten, met betrekking tot de effectiviteit van incentives, een-op-een vertaalbaar zijn naar longitudinaal onderzoek.

In deze studie gaan we in op het gebruik van incentives in longitudinaal onderzoek in het algemeen en meer specifiek op het gebruik voor het Mobiliteitspanel Nederland (MPN). Het MPN is een huishoudpanel dat tot doel heeft jaar-op-jaar veranderingen in het mobiliteitsgedrag van een vaste groep mensen en huishoudens in kaart te brengen en te verklaren. In deze studie geven we een state-of-the-art van het gebruik van incentives in longitudinaal onderzoek en de effectiviteit hiervan. Hierbij kijken we tevens naar algemene theorieën over belonen, wederkerigheid en intrinsieke en extrinsieke motivatie. Daarnaast maken we een vertaling van hoe deze verschillende incentive strategieën gebruikt kunnen worden voor longitudinaal onderzoek in het algemeen en hoe deze vertaald kunnen worden naar de specifieke situatie van het MPN. Hierbij besteden we aandacht aan de specifieke kenmerken van het MPN (longitudinaal, huishoudpanel, online onderzoek) en hoe deze van invloed zijn op de keuze van een incentive. Op basis van de literatuur geven we tevens een voorstel van hoe de incentive strategie van het MPN aangepast zou kunnen worden.

1. Background

There is a recent decline in the willingness of respondents to participate in surveys. The provision of incentives is one of the strategies available for reducing non-response. Incentives can be described as rewards the surveyor offers to respondents in order to increase the likelihood of their participation. As such, incentives serve as a motivational feature in survey design strategies. Most studies on the effectiveness of incentives are based on cross-sectional surveys. Overall, incentives are found to increase response rates effectively, but the impact of incentives varies depending on the mode of data collection, the type of incentive, and the delivery method used (Laurie & Lynn, 2009).

Due to the inherently burdensome nature of the survey design and the particular value to the researcher of encouraging repeated cooperation, incentives are especially likely to be used in panel surveys (Laurie & Lynn, 2009). Panel surveys suffer from problems not only in terms of initial recruitment, as is the case with cross-sectional surveys, but also in terms of the need to retain panel members over time in order to preserve the panel's longitudinal character and minimise the panel conditioning effects. Moreover, panel surveys tend to be more burdensome for participants than cross-sectional surveys, because panels are conducted more than once. Consequently, the investment (in terms of money, time and/or effort) required for both recruitment and retention is usually greater in panel surveys than in cross-sectional surveys (Singer & Ye, 2013).

As Laurie and Lynn (Laurie & Lynn, 2009) state, panel surveys differ in two ways from cross-sectional surveys in terms of how they use incentives. Firstly, the administration of incentives (e.g. type, value, method) to each potential respondent can vary in different waves, leading to a multitude of potential incentive regimes, each consisting of a combination of treatments across the various waves. Secondly, determining the effectiveness of incentives may be more complex in panel surveys than in cross-sectional surveys, and hence may need to be evaluated differently. Additionally, the decision to use incentives in panel surveys has long-term financial consequences for the survey, as well as with regard to the respondents' expectations (Laurie & Lynn, 2009).

This current study focusses on the use of incentives in panel research generally, as well as more specifically on their use in the Netherlands Mobility Panel (MPN). The MPN is a household panel that was set-up to study the short-run and long-run dynamics in the travel behaviour of Dutch individuals and households, and to determine how changes in personal and household characteristics, and in other travel-related factors, correlate with changes in travel behaviour (Hoogendoorn-Lanser, Schaap, & Olde-Kalter, 2014). The first wave of data collection started in 2013, with the sample being drawn from an existing access panel. The MPN consists of a screening questionnaire (only the first wave) and a household questionnaire that are filled out by an adult household member (gatekeeper), and an individual questionnaire and a travel diary that are filled out by each household member aged 12 and older. Annually, respondents are asked to fill in these questionnaires and the travel diary.

The research objective of this paper is twofold. The first objective is to provide a state-of-the art on the use of incentives in and beyond the field of transport research (both for cross-sectional and panel surveys). In doing so, we take into account more generic

theories on the effects of rewards, reciprocity, intrinsic/extrinsic motivation, etc (Berveling, 2013). The second objective is to contribute to the discussion on how various incentive strategies can be used for longitudinal research in practice, and more specifically for the MPN. This research contributes to an understanding of how incentive strategies are used in longitudinal surveys. Additionally, we discuss the lessons learned in the MPN with respect to the use of incentives in a household panel, the respondents' knowledge of the height and type of incentives, the role of different types of incentives, and the impact of changes in incentive strategies. In this study we do not focus on the use of other motivational features for stimulating the participation of respondents and increasing response rates (e.g. factsheets, information, invitation letters, reminders).

This paper is structured as follows. We begin with a description of the various types of incentives. We then discuss the state-of-the-art on the use of incentives in longitudinal research, as well as providing an overview of several psychological theories pertaining to the effectiveness of incentives. Results are discussed according to the three main characteristics of the MPN: (1) longitudinal survey; (2) household panel; and (3) an online panel. Subsequently, we discuss the MPN's current incentive strategy and how we recommend to adjust this strategy based on the literature findings described earlier in the paper. We end with conclusions and discussion.

2. Types of incentives

A distinction can be made between various types of incentives: monetary vs non-monetary, prepaid (unconditional) vs promised (conditional), and lotteries. A monetary incentive is for example money, a cheque or a gift voucher, while non-monetary incentives are gifts or the provision of information. An unconditional or prepaid incentive is paid without setting any conditions on participation, while a conditional or promised incentive is paid only if respondents fulfil the requirements for obtaining the incentive. By using prepaid incentives, potential respondents receive an incentive from the research or survey institute without having to "give" something back.

A lottery is another, often-used type of incentive strategy. As Göritz (Göritz, 2014) notes, lotteries are easy to implement and usually cap the associated costs, because most lotteries cost the same regardless of the number of participants. Although the chance of winning a lottery is often low, these lotteries are popular because respondents focus more attention on the height of the monetary value they can win rather than on their low chance of winning (Berveling, 2013).

3. Psychological theories

Several psychological theories can be used to explain how incentives influence survey participation. The theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), for example, argues that people decide on a course of action if the benefits of the action outweigh the costs. The leverage-salience theory (Groves, Singer, & Corning, 2000) argues that the decision of whether to participate in a survey depends on the subjective weight given to various factors in favour of and against participation, factors

made salient by the interviewers introduction to the survey either in-person, in a letter or via e-mail. Hereby, the ultimate level of incentives for survey participation not only depends on the incentives themselves, but is also related to numerous other survey features, such as the topic and the sponsor. For example, persons interested in a specific topic are more likely to participate in a study. The social exchange theory postulates that social exchange is based on the "norm of reciprocity" – namely, that Ego's "gift" to Alter creates an obligation to reciprocate with a gift to Ego (Gouldner, 1960). Unconditional incentives are thought to operate through this process of social reciprocity (Laurie & Lynn, 2009).

In addition to these psychological theories on predicting and explaining (non)participation, research also focused on respondent factors associated with (non)response. The effectiveness of incentives is expected to be influenced by the motivations of respondents to participate in a study. These motivations can often be divided into three categories: 1) altruistic (the belief that the research is important, wanting to be helpful to the researchers or society, civic duty); 2) egoistic (enjoys surveys, would benefit, interest in the results or in learning something); 3) motivations related to one or more survey characteristics (interest in the topic, respect for the organisation, length of survey) (Dillman, Smyth, & Christian, 2009; Singer & Ye, 2013). The use of incentives can therefore be expected to have varying effects for respondents whose motivations for participating in a study differ (Berveling, 2013). For example, Kropf and Blair (Kropf & Blair, 2005) conducted an experimental study on the reasons for refusal and found that egoistic motivations trump altruistic motives when potential respondents were offered an incentive. In addition, letters sent in advance to the respondents emphasising altruistic appeals (benefits from the survey for large numbers of people) over egoistic ones (benefit for the respondent) elicited higher returns. However, adding a monetary incentive significantly increased the response to both types of letters – altruistic and egoistic.

4. The use of incentives in panel surveys

4.1 Effectiveness of the use of incentives

Most studies on the effectiveness of incentives are based on cross-sectional surveys. Overall, it was found that incentives are effective in increasing response rates in cross-sectional surveys, but the impact of incentives varies depending on the mode of data collection, the type of incentive, and the delivery method used (Laurie & Lynn, 2009). Singer & Ye showed that using unconditional incentives is more effective than using conditional incentives (Singer & Ye, 2013).

Using lotteries as an incentive was found to have mixed results. Yanez et al. argue that raffling prizes after each wave is more effective than providing cash or gifts (Yanez, Mansilla, & de Dios Ortuzar, 2010). However, Singer & Ye conclude that prepaid incentives increase response rates more than lotteries do (Singer & Ye, 2013). In addition, Dillman concluded that lotteries have a relatively small, if any, effect on participation in offline surveys (Dillman, 2000).

In the context of longitudinal surveys, research on the long-term impact of incentives on respondent participation is scarce. Consequently, given the available empirical evidence, incentive-related decisions in longitudinal surveys cannot be wholly grounded in facts (Schaurer & Bosnjak, 2016). Moreover, it is questionable whether the types of incentives that proved to be effective in cross-sectional surveys are also effective in longitudinal surveys. For example, most findings related to monetary incentives come from cross-sectional studies (Callegaro et al., 2014).

In line with the evidence of cross-sectional studies, the evidence for the use of incentives in longitudinal surveys suggests that incentives can be effective in reducing attrition across multiple waves of a survey (Laurie & Lynn, 2009). Unconditional incentives have also proven to be more effective in longitudinal studies, and monetary incentives in turn are more effective than gifts in kind (Laurie & Lynn, 2009).

Many longitudinal surveys change their incentive strategy over time in an attempt to maximise longitudinal response rates (Laurie & Lynn, 2009). Laurie and Lynn state that there is still little or no evidence of the effectiveness of multiple combinations over time (Laurie & Lynn, 2009). Further, another area in which knowledge is lacking pertains to the impact of introducing an incentive for the first time in a longitudinal survey that previously had not used them.

Laurie & Lynn (Laurie & Lynn, 2009) note that it is virtually inevitable that long-running panel surveys using financial incentives from the study's first wave to increase the height of the monetary incentive over time, in order to keep the incentive meaningful for respondents. This increased incentive also demonstrates to long-serving sample members that their contributions remain important to the survey organisation. Laurie (Laurie, 2007) showed some evidence for the symbolic value of increasing the height of the incentives, in terms of demonstrating to respondents that they were appreciated and valued. Laurie & Lynn (Laurie & Lynn, 2009) also argued that a small, regular increase in the value of an incentive would be more effective than an occasional larger one.

In addition to increasing the value of incentives over time, other incentive strategies have also been cited as being effective. For example, Laurie & Lynn (Laurie & Lynn, 2009) noted that one effective strategy can be using some type of "golden handshake" to welcome and encourage the children of participating households who reach age 12 and join the survey. With a longitudinal design, it is possible to tailor incentive strategies by using the detailed information already known about respondents' previous response history and characteristics. This creates opportunities to vary incentive strategies for different subgroups. However, generally, using differential incentives, in which some respondents receive more than others, is avoided by most longitudinal surveys, or at least restricted to situations in which the various sample members have different response tasks (Laurie & Lynn, 2009). Little is known about the long-term effects of tailoring strategies, however, and especially when non-cooperative respondents receive a higher incentive. If a respondent receives a higher amount in one particular year, it is reasonable for them to expect to receive this amount the following year, and if they do not, they may drop out of the survey. Another potential problem concerning these differential incentives applies to surveys, such as household panel surveys, in which

multiple members participate, because offering varying amounts of money to different household members would be difficult (Laurie & Lynn, 2009).

Although most longitudinal surveys do not use differential incentives, many surveys do use some mechanisms for varying the incentives that the respondents receive. However, little is known about how successful these strategies are in delivering a long-term commitment to the study (Laurie & Lynn, 2009).

Although incentive strategies are often adjusted in longitudinal studies, the theoretical rationale behind these adjustments is often lacking. In many cases, such adjustments are made based on own experiences in the field, comments from interviewers and/or advice from survey practitioners, rather than on experimental evidence. In the absence of experimental evidence, it is difficult to disentangle the effects of incentives from other survey procedures designed to minimise losses to the sample, some of which may have significant impacts on response rates (Laurie & Lynn, 2009).

Non-response and attrition

The use of incentives in itself can also be a potential source of bias. In contrast to cross-sectional studies, the effects on long-term retention are perhaps more important than effects on wave-specific response rates. Evidence also suggests that the effect of a repeated incentive can grow more pronounced the more waves that are involved. Additionally, it is of interest if incentives encourage groups that are typically underrepresented in surveys to respond (such as those on low incomes, ethnic minority groups, and those with low levels of education), or whether the additional respondents are similar to the ones who would respond regardless, in which case incentives have no beneficial effects for reducing non-response bias (Laurie & Lynn, 2009). Statistics Netherlands performed an experiment in which they compared the effectiveness of (1) an unconditional incentive of €5.00 sent with an advance letter, (2) a lottery of an iPad, and (3) no incentive. It was found that the effectiveness of the incentive strategies differed per group of respondents (e.g. age, ethnicity, income, urbanity) (Statistics Netherlands, 2016).

Singer & Ye tested several hypotheses about the effect of incentives on quality of response, sample composition and response distribution. It was found that only a few studies addressed these issues, and most of them did not find any significant effects of incentives on these aspects (Singer & Ye, 2013). Future research is needed in order to be able to draw conclusions on this topic.

4.2 Timing

In addition to the types of incentives used, the timing of when these incentives are used is also crucial. As noted by Berveling (Berveling, 2013), who conducted a study on the use of rewards in several policy domains, there should be a clear connection between participation in a survey and the incentive provided, but if too much time elapses between those two actions, one can expect that the incentive will become less effective, as the respondents no longer see a clear connection between the incentive and their participation in a survey.

4.3 Height

The height of the monetary incentives is also important. Monetary incentives should not be too low, because they will then fail to stimulate respondents to participate in the study. Monetary incentives can also have a counterproductive effect, "crowding out" the altruistic motivations. When respondents intrinsically motivated to participate in research are offered an incentive, this can adversely affect their intrinsic motivation. When the monetary incentive is too high, respondents will only participate in a study because of this incentive. Generally, it can be argued to "pay the right amount". Berveling et al. (Berveling, 2013) devised a schematic overview of how sensitivity to monetary incentives and the presence of social and moral motivation influence each other (Figure 1).

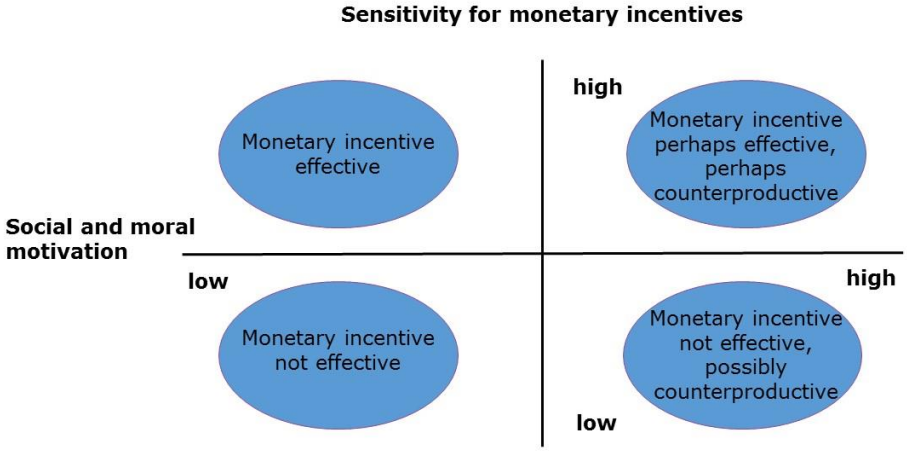

Figure 1. Effectiveness of monetary incentives in relation to motivation (Berveling, 2013)

The optimal height of monetary incentives remains unclear, however. According to some studies, increasing the height of incentives does increase response rates, yet does so at a declining rate (Singer & Ye, 2013). Further, the impact from the height of monetary incentives differs per target group (e.g. lower monetary incentives are needed for low-income groups than for high-income groups) (Singer & Ye, 2013).

An additional possibility is to provide respondents with a choice of type of incentive (e.g. cash, a gift, or donating to a charity), which allows the respondents to tailor the incentive to fit their own personal preferences in terms of altruism or individual benefit. However, as shown by Laurie & Lynn, the effects that such tailoring has on response rates and biases are unknown (Laurie & Lynn, 2009).

5. Household panel

In this paper we define a household panel as a panel study in which data from more than one household member is collected. In a household panel, a decision can be taken to differentiate between individual incentives and household incentives. As Laurie and Lynn

have shown (Laurie & Lynn, 2009), only very few studies use a household incentive. For example, the Household Income and Labour Dynamics in Australia (HILDA) survey (Laurie & Lynn, 2009), and the German Mobility Panel (Weiß, Chlond, von Behren, Hilgert, & Vortisch, 2016), use a household incentive. The HILDA survey's incentive strategy has changed over the years, from only a household survey to both an individual and household incentive. The reason for this was that it was unclear if the one person in the household who received the household incentive shared this incentive with the other household members. Moreover, the height of the incentive was raised, as it was deemed somewhat unfair that large households received the same amount of incentives as smaller households (Laurie & Lynn, 2009). Generally, however, the rationale of choosing between an individual and household incentive is often lacking, as are corresponding studies pertaining to the effectiveness of such incentives.

6. The use of incentives in online research

In recent years the use of the Internet for both cross-sectional surveys and panels has increased greatly. Nevertheless, research on the effectiveness of using incentives in online research is quite limited (Singer & Ye, 2013). Due to differences between offline and online research (device, logistics, respondents and their participation process, etc), it is questionable whether findings from offline studies can be generalised to the online realm (Göritz, 2006). An online panel constitutes a pool of people who have signed up to occasionally participate in web surveys (Göritz & Wolff, 2007), meaning that these respondents have already made up their minds about participating in surveys, and hence the participatory invitation does not arrive unexpectedly (Göritz, 2006). The attraction of these online panels for researchers is threefold: 1) fast data collection; 2) promised lower costs per interview than with other methods; and 3) sampling efficiency due to extensive profiling (Callegaro et al., 2014).

In the review of Göritz (Göritz, 2006), most of the work done on the use of incentives in online research was summarized; she found that incentives significantly increased the proportion of respondents starting the survey and the proportion completing it. Singer & Ye (Singer & Ye, 2013) concluded in their review that incentives in online surveys appear to increase the likelihood of responding, as compared to a no-incentive group. Although prepaid incentives were found to be more effective in terms of response, compared to conditional incentives, these are more difficult to implement in web surveys (Singer & Ye, 2013).

As previously mentioned, monetary incentives proved to be effective in offline research. In online research, it is difficult to pay online panellists in cash; consequently, such monetary incentives are usually paid using online intermediaries, such as PayPal, or in a propriety currency, such as loyalty points (Göritz, 2014). In a five-wave experiment, Göritz (Göritz, 2008) investigated the differences in initial responses and drop-out rates between the provision of loyalty points and a cash lottery. Initially, no differences were found in the starting rate, but over time the loyalty points outperformed the lottery.
Lotteries - conditional on completion - were found to be the most popular incentives, especially among access panels, and comparisons with other types of incentives are rare (Göritz, 2006). As shown by Göritz (Göritz, 2014), mixed effects were found in literature

concerning the impact that using a lottery had on starting rates and completion rates. However, most studies on the effectiveness of lotteries were based on a cross-sectional design (Göritz & Wolff, 2007). One study that focused on the effectiveness of lotteries in panel research was conducted by Göritz & Wolff (Göritz & Wolff, 2007), who performed an experiment in which they examined the influence of a lottery of gift certificates on response and retention in a four-wave study in an online panel. For each wave a lottery was held among the respondents belonging to the experimental group, with the result being that the lottery increased the number of respondents starting the study in Wave 1, but had no further effects in the subsequent waves. Göritz & Wolff argue that the lottery's failure to impact subsequent waves was due to the fact that the participants had gained experience with the lottery over time and came to understand that their chances of actually winning a prize were low. Additionally, no direct effects were found between the lottery and drop-out rates during the waves. However, because the results are mixed and only a few studies on the use of lotteries in online panel research have been conducted, we are unable to draw any firm conclusions about the effectiveness of such lotteries.

7. Translation of results from the literature review to the incentive strategy of the Netherlands Mobility Panel

As previously stated, the MPN is a household panel that was set-up in order to study the short-run and long-run dynamics in the travel behaviour of Dutch individuals and households, and to determine how changes in personal and household characteristics, and in other travel-related factors, correlate with changes in travel behaviour (Hoogendoorn-Lanser et al., 2014). The first wave of data-collection started in 2013. The MPN consists of a screening questionnaire (only first wave) and a household questionnaire that are filled out by an adult household member (gatekeeper), and an individual questionnaire and a travel diary that are filled out by each household member aged 12 and older. Annually, respondents are asked to fill in these questionnaires and the travel diary.

One of the MPN's goals is to study the interaction between household members. Consequently, it was decided that all household members should fill in the travel diary on exactly the same days, as this would provide the authors with insights into the intra-household interactions regarding mobility (Hoogendoorn-Lanser et al., 2014). All households are contacted through the so-called gatekeeper, an adult contact person who was approached to fill in both the screening and household questionnaire. This gatekeeper also receives general notifications and reminders (in addition to the personal invitations and reminders that individual household members receive). This enables the gatekeeper to encourage the other household members to participate in the study. In-depth interviews held at the end of Wave 1 (Hoogendoorn-Lanser et al., 2014) and Wave 4 revealed that the gatekeeper was indeed found to play a crucial role in improving responses within the household.
The MPN sample was drawn from an existing access panel. The contracted fieldwork agency has a standard incentive strategy consisting of a point revenue system. As a result, we were not able to design an incentive strategy from scratch, although it was possible to make some adjustments regarding the timing and height of the incentives.

We therefore decided to use a household incentive, as this would allow household members to encourage each other to participate in the study. Additionally, two raffles are held to encourage even greater participation.

The incentive strategy currently consists of three different aspects (all conditional):

- A household receives €10.00 in revenue points if the entire household has completely participated;
- A raffle of 400 webshop vouchers worth €10.00 each is held among the completely participating respondents;
- A raffle of 40 family excursions is held among the completely participating households.

Respondents can convert the revenue points into a voucher for specific webshops, air miles or as a donation to a charity organisation. By giving respondents the opportunity to choose between the various vouchers and purposes, they are able to choose the incentive that best fits their motivation (e.g. altruistic, egoistic). As Göritz (Göritz, 2008) has shown, the provision of loyalty points is an effective incentive strategy.

The MPN's incentive strategy is part of a larger package of measures aimed at stimulating respondents' participation and increasing response rates. For example, various instruction materials are available to the respondents (e.g. a manual, an instructive video on the diary website, a memory jogger). Moreover, there is a free telephone helpline and online assistance, as well as a reminder strategy. Respondents also receive factsheets, giftcards, and animated films (available at https://english.kimnet.nl/the-netherlands-mobility-panel), showing some of the results and insights derived from the MPN. The in-depth interviews revealed that the MPN respondents appreciated seeing these results and insights. Further, it was found that such measures were evaluated differently depending on age, gender, etc. The authors therefore decided to use this broad range of measures. As previously stated, those measures are not included in the scope of this paper.

In Wave 3, the incentive strategy was adjusted: the prizes that households could win in the raffle if completely participating were changed. In Waves 1 and 2, instead of the family excursions, an e-scooter and an e-bike were raffled off. The decision to change this raffle was based on the fact that respondents perceived the chance of winning one of these 'big' prices as too low. An additional advantage of the family excursions was that not just one but all household members profited from it. When winning the lottery, households could choose from a list of family excursions and received the tickets of their choice. The family excursions offered were chosen in such a way as to ensure there were good options for all households, but households with children were especially encouraged to participate. However, this adjustment of the incentive strategy was not based on a theoretical rationale, but rather on statements made by respondents when communicating with the fieldwork agency helpdesk.
Although we do have the information about who won the raffles, we are unable to quantify the effects of the current incentive strategy, owing to the fact that the incentive strategy is complex (including monetary and in-kind incentives) and that participation in the MPN may be influenced by factors outside of our span of control. What we can state however is that the current incentive strategy still faces some drawbacks. Several

households contacted the fieldwork agency helpdesk to express the view that larger households perceive the incentive to be somewhat unfair. Currently, all households receive the same incentive, irrespective of household size. Moreover, a guaranteed incentive is only provided when the entire household has participated, which could have caused higher levels of unit non-response, because for example the gatekeeper knows beforehand that one of the household members is unwilling to participate in the following wave, and hence this may have caused the entire household to drop out. Further, as seen in Table 1, there is a decline in participation rates over the various waves. Only 43% of the households that started in Wave 1 were still completely participating in Wave 4, and the same was true for the participants starting in one of the later waves.

Table 1. Number of complete households and persons participating in the various waves of the MPN

		Wave 1	Wave 2	Wave 3	Wave 4
Start wave					
Wave 1	Complete households	1,978	1,252 (63%)	1,018 (51%)	859 (43%)
	Complete persons	3,996	2,538 (64%)	2,114 (53%)	1,683 (42%)
Wave 2	Complete households		843	388 (46%)	328 (39%)
	Complete persons		3,013	1,482 (49%)	1,163 (39%)
Wave 3	Complete households			169	69 (41%)
	Complete persons			323	158 (49%)
Wave 4	Complete households				503
	Complete persons				1,355
Total	Complete households	1,978	2,095	1,575*	1,759
	Complete persons	3,996	5,551	3,919*	4,359

*) No new households were recruited in Wave 3.

In 2018, we will have the opportunity to design a new incentive strategy, as the contract with the current fieldwork agency is ending. Although we will continue with the current respondents, this does create the opportunity to reconsider the current incentive strategy and design a new incentive strategy. In the following section we discuss the lessons learned in the MPN with respect to using incentives in a household panel, the respondents' knowledge of height and type of incentives, and how we aim to adjust the incentive strategy.

7.1 Type of incentives

The previous sections described several effective incentive strategies. However, not all of these can be translated to the MPN. For example, because the MPN is a national travel survey, cash cannot be used as an incentive (tax regulations apply). Additionally, it is not deemed ethical for a governmental research institute to differentiate the height of the incentives between groups; for example, by giving low-income groups a higher incentive in order to convince them to participate in the study. Moreover, because we want to continue using the respondents currently engaged with fieldwork agency, we are prohibited from abandoning the point revenue system.

In the in-depth interviews we asked the respondents about the current incentive strategy. Contrary to our expectations, most of the respondents were unaware of the height of the conditional incentive. Moreover, while some of them were aware of the raffle, they were often unaware that the prizes had changed between Waves 2 and 3

(most still thought that the e-bike and e-scooter were raffled). Most respondents stated that they knew that the fieldwork agency offered them a suitable incentive. The respondents' ignorance about the incentive structure could have been caused by the fact that information about incentives was not displayed on a main screen, but rather was only shown if one pressed the help button. However, the respondents were informed of the raffle prizes when initially asked to participate in the MPN, as well as by a subsequent email when the prizes were changed. Additionally, some respondents complained that the incentive was paid to the gatekeeper, and that other participating household members did not have their own revenue points accounts. This may have influenced the response rates of the hard-to-reach groups, such as teenagers. However, the points earned by the revenue system were usually used to save for webshop vouchers, which are often used to buy items for the household or the children.

Based on the state-of-the-art, an unconditional incentive was found to be most effective. However, since we use an existing access panel, literature has shown that the provision of an unconditional incentive is difficult to implement in online research (Singer & Ye, 2013). Moreover, because the respondents are already familiar with the workings of the fieldwork agency's incentive strategy, as well as the budgetary restraints, we decided not to use these unconditional incentives. Lotteries are common practice in online research, and were also found to be more effective in online research than in offline research (Singer & Ye, 2013). We therefore aim to use both a conditional incentive and a lottery as an incentive strategy in the next waves of the MPN.

In addition, we aim to increase the conditional incentive, by making it household-size dependent and by providing individuals with a guaranteed reward for their contributions. As previously stated, large households currently receive the same amount of money as an one-person household, and individuals who are willing to participate did not receive the household incentive when other household members failed to fill out the questionnaires and diary. Both of these matters were perceived to be somewhat unfair. We therefore aim to increase the conditional incentive by paying every household member an individual incentive after completing a questionnaire or travel diary. Households will still receive an incentive when all household members completely participate.

7.2 Timing

At present, only the gatekeeper receives the conditional incentive when the complete household participates. Further, the raffles are held after this check of complete participation has occurred. However, this check takes the fieldwork agency quite some time to complete, and consequently the period of time between completing the questionnaires and travel diaries and receiving the incentive is relatively long. Moreover, respondents could not be asked immediately what option they wanted their revenue points translated to, because at the time when the gatekeeper is finalising the questionnaires and the diary, it is not yet known if his or her family members did so as well. If the complete household has participated, the revenue points are automatically translated to the option selected in the questionnaire prior to starting the MPN. The literature has shown that there should be a direct connection between participation and the incentive provided (Berveling, 2013). This direct link is currently missing in the

incentive strategy. We therefore aim to give every respondent an incentive immediately upon completing a questionnaire or travel diary.

When a child reaches the age of 12, they automatically become part of the MPN research population and are expected to participate in the study. As Laurie & Lynn (Laurie & Lynn, 2009) noted, using some type of "golden handshake" to welcome these children is an effective incentive strategy. We therefore aim to give every child reaching the age of 12 an extra incentive in the first year that they participate in the study.

7.3 Height

As Laurie & Lynn (Laurie & Lynn, 2009) noted, it is inevitable for long running panels using financial incentives from the start to increase the incentives over time. The reason for this is that not only do costs of living increase over time, but also increasing the height of the incentives demonstrates to long-serving respondents that they remain important to the survey organisation. The introduction of an individual conditional incentive means an increased incentive for households and individuals. Moreover, we aim to give households that have already participated in Waves 1 to 5 an extra bonus if they also participate in Wave 6. This is a particularly sensitive moment in the process, as both the role of the fieldwork agency, and the appearance of the questionnaires and diary, are changing.

7.4 Use of an existing access panel

Using a sample from an existing access panel implies that one must take into account the existing incentive strategy of the fieldwork agency. Moreover, another aspect comes into play: respondents are not exclusively assigned to the MPN, but still participate in other surveys conducted by the fieldwork agency. Although both the fieldwork agency and the authors have taken precautions to minimise the influence of other surveys on MPN response, it can never be completely disregarded. For example, restrictions are placed on the minimum timeframe between two subsequent surveys and on survey topics. On the one hand, the possible influence of other surveys on the MPN response renders it difficult to quantify the impact of (changes in) the MPN incentive strategy. On the other, carefully conducting additional surveys will keep the MPN alive. By 2017, additional surveys that are conducted in the MPN are mainly initiated by the authors themselves, making them more in control.

8. Conclusion

In summary, we aim to change the incentive strategy in 2018 in the following ways:

- The household receives an incentive when completely participating;
- Every respondent receives an incentive when completing a questionnaire or travel diary;
- A raffle is held among completely participating respondents;
- A raffle is held among completely participating households;
- All households receive an additional bonus when they participate in Wave 6 (in 2018).

- Every child reaching the age of 12 receives an extra bonus when completely participating.

9. Discussion

In this study we focused on the use of incentives in panel research generally, as well as more specifically on their use in the MPN. Special attention was paid to household panels and online panels. Lessons learned from the state-of-the-art are translated to a plan for adjusting the MPN's incentive strategy.

Although incentives have proven to have an effect on response rates, incentives also have the potential to both increase and reduce non-response bias (Singer & Ye, 2013). Singer and Ye (Singer & Ye, 2013) therefore argue that much better information about the mechanisms through which nonresponse bias occurs, and the likely impact of incentives on those mechanisms, is needed if incentives are to be used for effectively targeting nonresponse bias. Future research is required to delve deeper into these mechanisms. Additional research is also needed on the use of incentives in panel research, and how adjusting the incentive strategy impacts response rates, as well as research quality.

In addition, Laurie and Lynn (Laurie & Lynn, 2009) noted that incentives in panel research are usually part of a larger package of measures designed to inform and motivate respondents (e.g. factsheets, information, invitation letters, reminders). These additional motivational features were not included in the scope of this study. Literature also reveals that there is a multitude of various strategies and combinations of strategies in use, and any clear ranking as to which is most impactful in terms of reduced non-response or other quality aspects does not yet exist (Lund & Gulløy, 2016). Future research should focus on how these various aspects impact response rates.

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