methods, data, analyses | Vol. 11(1), 2017, pp. 7-28 DOI: 10.12758/mda.2016.014

The Wave 6 NEPS Adult Study Incentive Experiment

Sara Kretschmer [1,2] *& Gerrit Müller* [2]

1 *Leibniz-Institut für Bildungsverläufe e.V.*

2 *Institut für Arbeitsmarkt- und Berufsforschung (IAB) der Bundesagentur für Arbeit*

Abstract

In wave 6 of the National Educational Panel Study (NEPS) adult starting cohort, an incentive experiment was conducted that randomly switched respondent cash incentives from promised to (partly) prepaid for half of the eligible sample. This research note examines the effects that this change in incentive scheme had on response rates, on sample composition in terms of some key survey variables, and fieldwork efforts by interviewers. We find moderately sized positive effects on overall response rates. The switch in incentive scheme appears to be particularly effective in raising response rates of low educated individuals and those with low reading and mathematics competencies, subgroups that participated underproportionately in prior waves. This differential reaction to the changed incentive scheme therefore leads to a somewhat more balanced sample composition along these dimensions. In line with prior studies, effects on fieldwork efforts such as the number of contact attempts to obtain an interview could be found, but are small in magnitude.

Keywords: NEPS adult study, incentive experiment, nonresponse, bias, sample composition, fieldwork efficiency

1 Introduction

In this research note, we report on the effects of a randomized experiment that switched respondent cash incentives from promised to (partly) prepaid in wave 6 of the National Educational Panel Study (NEPS) adult starting cohort. With regard to interviewer-administered surveys at the household or individual level like the NEPS adult study, it is well known that achieving high response rates is an increasing problem, not only in the German survey environment but also internationally. Several studies document declining response rates over the past decades, both across countries and various survey topics (Atrostic, Bates, Burt & Silberstein, 2001; de Leeuw & de Heer, 2002; Pew Research Center, 2012). As is well known, besides affecting sample size and statistical power of a study, the issue is that unit nonresponse may lead to nonresponse bias when sample members' characteristics differ between respondents and nonrespondents (Schnell, 1997; Groves et al., 2006; Groves & Peytcheva, 2008; Bethlehem, Cobben & Schouten, 2011). That is, depending on the nature of the relation between sample members' individual likelihood to respond and key survey variables, unit nonresponse may induce selection bias into substantive analyses based on data of the realized sample only. Considering the initial waves of the NEPS adult study, there appears to be evidence of selective initial nonresponse and attrition related to educational attainment and basic competencies. In particular, lower educated individuals are less willing to respond both in the first wave and in consecutive panel waves (Zinn, Aßmann & Würbach, 2015). In a similar vein, Kleinert, Christoph & Ruland (2015) report that participants with lower mathematics and reading proficiency attrite from the panel more frequently.

In an effort to keep unit nonresponse and subsequent attrition low, the NEPS adult study offered (conditional) cash incentives right from its inception. The use of cash incentives for respondents has become common practice in most academic surveys in Germany in recent years (e.g. Blohm & Koch 2013; Börsch-Supan, Krieger & Schröder 2013; Blom, Gathmann & Krieger 2015). Pforr et al. (2015) currently offer the most comprehensive overview of incentive effects on response rates and nonresponse bias for Germany, based on eight major cross-sectional and panel surveys (ALLBUS, GIP, NEPS, PAIRFAM, PASS, PIAAC, SHARE and SOEP; Ibid. p.2, for more details on the cited surveys.). However, at the time of their writing, Pforr et al. (2015) only considered evidence from a comparatively small *pilot study* (infas, 2009) to the actual NEPS adult study. In that regard, this research note seeks to complement previous findings and is the first to report on the effects of monetary

Direct correspondence to
Sara Kretschmer
Leibniz-Institut für Bildungsverläufe e.V., Wilhelmsplatz 3, 96047 Bamberg
E-mail: sara.kretschmer@lifbi.de

respondent incentives for the *main study* of the NEPS adult cohort. Thereby, it is also the first to document the wave 6 incentive experiment: In waves 1-5, respondent cash incentives were always provided conditionally on the interview. As we shall explain in more detail below, in wave 6, an experiment was conducted that randomly switched respondent cash incentives from promised to (partly) prepaid for half of the eligible sample.

Against this backdrop, the aim of this research note is threefold: First, we are going to examine how the partial switch to prepaid incentives affected wave 6 response rates, overall, and differentiated by prior wave response status. Second, given the initial nonresponse and attrition biases in terms of educational attainment and competencies referred to above, we explore how this intervention affected sample composition along these particularly relevant (for NEPS) dimensions.[1] Third, given the ever increasing costs associated with fieldwork, especially in face-to-face mode, we investigate how the changed incentive scheme affected fieldwork efficiency as measured by the number of contact attempts per interview and speed of survey response.

As this note is deliberately exploratory in nature, we shall only briefly draw on some common theoretical perspectives related to "social exchange" (Dillman, Smyth & Christian 2014) and "leverage-salience" (Groves, Singer & Corning 2000) to identify potential mechanisms driving the (changed) participation behavior in response to the changed incentive scheme. Since the NEPS adult cohort study has used conditional cash incentives from the beginning, the key change to consider theoretically is the move towards prepaying: (part of) a promised payment for participation is being turned into a payment, or token of appreciation, provided in advance. Viewing the request for survey participation as a specific form of social interaction and exchange, the move towards unconditional giving may evoke behavioral "norms of reciprocity" (Gouldner, 1960). That is, recipients of the prepaid incentive may feel obligated to "return the favor" and respond positively to the subsequent survey request. Especially for individuals on the brink of (non) participation this mechanism may override other -negatively valued- aspects of the survey request, "tilting the scale" in favor of participation (c.f. Groves et al., 2004; p. 177). For example, one may think of those generally uninterested in the survey topic (here in the NEPS context, probably the lower educated), or one may think of those sensing a particularly high burden or time demands of participation (as potentially manifested in temporarily dropping out in a wave before). However, whether the described reciprocity mechanism is indeed that powerful, and how exactly it would affect various subgroups differentially, is difficult to settle a priori.

1 The authors of this research note were not involved in the design of the experiment. Given that the intervention was not targeted at particular subgroups but applied equally to the full eligible sample, we assume that the primary goal was to increase survey participation by and large.

Recipients of prepaid incentives may just as well not conform to norms of reciprocity, or even feel pressured into the survey, questioning the legitimacy of the survey sponsor altogether (e.g. Börsch-Supan et al., 2013). For individuals who attach a high importance to these aspects of a survey request, prepaying may actually push against participation.

The remainder of this note is structured as follows. In the next section we shall briefly refer to the empirical literature on the effects of respondent incentives in cross-sectional and panel surveys. After this, we introduce a few relevant survey design features of the NEPS adult study, describe the wave 6 incentive experiment, and define our analysis sample. In what follows, we present the effects of prepaid incentives on overall wave 6 survey participation (differentiated by respondents' wave 5 outcome) and then turn to our key empirical findings concerning sample composition in terms of educational background and competence test results. Finally, we investigate the effects of prepaid incentives on fieldwork efficiency and conclude with a brief summary of our findings.

2 Some Previous Research on Incentives and Survey Participation

There is a considerable empirical literature on the effects of respondent incentives on participation, based on cross-sectional and panel surveys of varying topics, conducted in different modes, by various survey sponsors and fieldwork agencies, across several countries. Given the brevity of this research note, we abstain from an extensive literature overview here. In that regard, Singer, van Hoewyk, Gebler, Raghunathan and McGonagle (1999) and Laurie and Lynn (2009) both provide comprehensive overviews of the international literature, the former focusing on respondent incentives in cross-sectional surveys, the latter on longitudinal surveys. As mentioned above, Pforr et al. (2015) recently summarized the evidence for Germany, concluding that most of the international findings carry over to the German survey environment.

In a nutshell, past empirical research on the effects of respondent incentives in interviewer-administered surveys typically finds that incentives increase response rates, that monetary incentives are more effective than non-monetary incentives, and that prepaid incentives affect response rates more strongly than conditional incentives (e.g. Singer et al., 1999; Singer, 2002; Yu & Cooper, 1983; Willimack, Schumann, Pennel & Lepkowski 1995; Ryu, Couper & Marans, 2005). In addition, there are studies suggesting that large incentives increase response rates more than small incentives, albeit at a decreasing rate (e.g. Mercer, Caporaso, Cantor & Townsend, 2015; Scherpenzeel & Toepoel, 2012; Rodgers, 2011).

When incentives are introduced at later waves of panel surveys it is usually found to generate much smaller increases in response rates than similar incentives would yield in cross-sectional surveys, or initial waves of panel surveys (e.g. Laurie & Lynn, 2009; Laurie, 2007; Jäckle & Lynn, 2008). One likely reason is that the panel attrition, which is typically largest in the early waves, has left a fairly cooperative sample that responds rather little to later changes in the incentive scheme. However, one subgroup that typically does react quite strongly to introducing (or increasing) incentives in panel surveys are nonrespondents at the previous wave (e.g. Zagorsky & Rhoton, 2008; Rodgers, 2011).

Relatedly, there are studies suggesting that incentives may be effective in boosting participation of certain demographic groups ordinarily underrepresented, such as people with lower income, ethnic minority status (e.g. James, 1997; Mack, Huggins, Keathley & Sundukchi, 1998) or with low education status (e.g. Berlin et al., 1992; Ryu et al., 2005). However, overall, the evidence is somewhat more mixed than the selected references suggest. For instance, in their meta-analysis Singer et al. (1999) also refer to a number of studies showing no favorable effect of respondent incentives on sample composition at all (Ibid. p. 224-225).

Finally, incentives may affect fieldwork efficiency by reducing the number of calls an interviewer has to make in order to obtain an interview. For example, James (1997) and Rodgers (2002) both find that providing cash incentives may lead to a reduction in the number of calls per completed interview, although the orders of magnitude are rather small. Similarly, in a recent study based on the German General Social Survey (ALLBUS) Blohm and Koch (2013) found a slight reduction in the average number of contact attempts per completed interview by the use of monetary incentives. Mann, Lynn and Peterson (2008) point out that incentives may positively affect early survey response and response speed, thereby increasing fieldwork efficiency through the reduction of intense (and costly) follow-up efforts that would otherwise be necessary.

3 Design and Sample of the NEPS Adult Study

The NEPS is the largest longitudinal study for educational research in Germany. It was established in 2009 for the purpose of collecting survey data about learning environments, educational decisions and returns to education over the entire life-course (Blossfeld & von Maurice, 2011). Furthermore, one of the core issues is to assess the development of competencies, such as reading, basic mathematics or ICT proficiency, and their repeated measurement (Allmendinger et al., 2011). In order to provide data across several periods of life as soon as possible, the NEPS fielded six separate starting cohorts of different age groups. The NEPS adult study, on which we report here, comprises the oldest age groups born between 1944 and

1986, with a questionnaire focused on adult education and the development of competencies in adulthood. The NEPS adult study is conducted annually since 2009. All sample members were drawn from resident registers (Einwohnermelderegister) run by the municipal residents' registration offices, and represent individuals living in private households in Germany born between 1944 and 1986 (Zinn et al., 2015). The first wave of the NEPS adult cohort comprises participants of the 2007/08 prequel study "Working and Learning in a Changing World" (ALWA) born between 1956 and 1986.[2] All respondents to the ALWA study who agreed to be contacted for further interviewing were included in the gross sample of the NEPS adult cohort initial wave in 2009/10. This core wave 1 sample was again supplemented by two additional samples: first-time participants in the same age range as the original ALWA sample (boost sample) and older respondents born between 1944 and 1955 (augmentation sample). In NEPS wave 3, another refreshment sample was added consisting of all birth cohorts from 1944 to 1986 (for further details, be referred to the documentation by the Leibniz-Institut für Bildungsverläufe e.V., 2015).

In the initial wave, respondents are asked about their social and migration background as well as their educational, job and family history retrospectively. These retrospective data are continuously updated in subsequent waves. Moreover, respondents answer questions about their social and cultural capital, health, well-being and social and political participation (Allmendinger et al., 2011). All data are collected in a mixed-mode design with computer assisted telephone interviews (CATI) and computer assisted face-to-face interviews (CAPI). In the initial wave and in every *odd* wave, computer assisted telephone interviewing is the default mode. In *even* waves respondents are asked to additionally take part in competence assessment with paper and pencil, or computer-based. In these waves, face-to-face interviewing is the default mode. In each wave, a small number of interviews is conducted in Turkish or Russian, mainly in telephone mode. If respondents are hard to contact or initially refuse participation in either mode, the study design allows for a mode switch. Participants who do not respond in one or more waves remain in the sample and keep being contacted in subsequent waves. Only those who eventually cannot be located and contacted anymore, or those who explicitly refuse to further participate ("hard refusals") are excluded from the sample.

Up to and including wave 6, three "rounds" of competence assessment have been administered to participants in the even waves. In order to keep the overall burden low, wave 2 sample members were randomly assigned to one of three groups: reading assessment only, mathematics assessment only, both assessments. In wave 4, all sample members who had entered the study in the first NEPS wave were asked to take part in science literacy and information and communication technology (ICT) assessment. Respondents who had entered in the third wave

2 For details on the ALWA survey, which has been conducted by the Institute for Employment Research (IAB), be referred to Antoni et al. (2010).

(refreshment sample) were asked to take part in reading assessment. In wave 6, the competence assessment includes measurements on listening comprehension at word level and general cognitive functions for all sample members.

3.1 The Incentive Experiment in Wave 6

Based on evidence from the NEPS pilot study (infas, 2009; Pforr et al., 2015), respondents of the main study were offered conditional cash incentives right from the beginning. In wave 1, the NEPS adult study started out with a 10€ cash incentive, which was temporarily raised to 50€ in the second half of the wave 1 fieldwork period due to low initial response. In wave 2, the incentive was increased to 25€ cash conditional on the interview throughout. From wave 3 to wave 5, the incentive was again lowered somewhat to 20€ cash conditional on the interview. In wave 6, the mentioned randomized split-half experiment was used to test the effects of switching to prepaid incentives: one group kept receiving 20€ conditional on the interview as in previous waves (control group). The other group received 10€ unconditionally with the advance letter and another 10€ conditional on the interview (treatment group). The randomization happened at the respondent level. That is, in principle, each one of the 255 CAPI interviewers initially working the sample had cases with and without prepaid incentives. The experiment was run "half blind", that is interviewers knew the incentive status of individual sample members, but each potential respondent was uninformed about the experiment.[3]

3.2 Analysis Sample & Data

Our analysis is based on all sample members eligible for a wave 6 interview. We exclude foreign language interviews because these cases were not part of the randomized experiment. This leads to an analysis sample of 12,280 cases. As just explained, about half of them received postpaid incentives only (n= 6,146) as in previous waves, while the other half received 10€ with the advance letter plus another 10€ conditional on the interview (n= 6,134). To measure the effects of pre-

3 Given the half-blind design, one may wonder whether interviewers worked cases with prepaid incentives first, thereby implicitly driving some of the differences in outcomes. Similar to Börsch-Supan at al. (2013) for SHARE, working with the same survey agency and prepaid incentives, we did not find evidence for that. The average number of days until the first contact attempt (after a case is being released to an interviewer) is equal across the two incentive conditions.

paid incentives, we employ survey data from wave 1 to wave 5.[4] In addition we also use wave 6 call record data provided by the fieldwork institute to identify the final outcome[5] and analyze fieldwork efficiency.

4 Results

First, we shall briefly present our findings on the effect of prepaid incentives on overall response, contact, and refusal rates. We then differentiate further and evaluate the effects separately for wave 5 respondents and nonrespondents, distinguishing among several reasons for previous wave nonresponse. In what follows, we focus on whether the changed incentive scheme differentially affected the participation of various subgroups in terms of education status and competencies. We find this a good starting point for identifying relevant (for NEPS) selection effects, rather than looking at some arbitrary set of sociodemographic variables that may in the end only be weakly related to the substantive variables of interest.[6] Finally, we investigate the effects of prepaid incentives on some indicators of fieldwork efficiency.

4.1 The Overall Effect of Prepaid Incentives in Wave 6

Overall response rates have been fairly constant, levelling off between 77% and 79% (RR1 following the standard definitions of The American Association for Public Opinion Research (2015) in the waves prior to the experiment. Concerning wave 6, we find that for sample members with (partly) prepaid incentives response rates are somewhat higher (80%) as compared to those with postpaid incentives only (78%). The difference of about 2 percentage points is not very large, yet statistically significant[7] (p-value 0.006). About 15% amongst sample members with postpaid incentives refuse participation, while only 13% with prepaid incentives refuse. This reduction in refusals essentially accounts for the overall 2 percentage point differ-

4 This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort Adults, doi:10.5157/NEPS:SC6:5.1.0. From 2008 to 2013, NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

5 The final outcomes recorded in the call record data may marginally differ from outcomes reported in the final method report published by the survey institute.

6 However, for completeness and comparison with other studies, we have included a table in the appendix showing response rates (treatment vs. control group) for a whole set of variables typically considered (Appendix, Table A1).

7 Proportions compared with two sample t-tests taking into account clustering at the PSU level (municipalities).

Table 1 Wave 6 Response Rates by Wave 5 Outcome (N= 12,280)

	postpaid			(partly) prepaid			col	
	(n= 6,146)	Interview		(n= 6,134)	Interview		(2) - (1)	p-value
W5 respondents	*5,295*	85.1%	*4,508*	*5,217*	87.4%	*4,561*	2.3%	0.001
W5 nonrespondents	*851*	34.1%	*290*	*917*	38.6%	*354*	4.5%	0.033
Refusals		31.3%	*137*		34.1%	*151*	2.8%	0.363
Noncontacts		44.8%	*26*		51.9%	*41*	7.1%	0.409
Appointments		28.2%	*51*		40.5%	*85*	12.3%	0.006
Other nonrespondents		43.7%	*76*		41.6%	*77*	-2.1%	0.678

ence. Concerning overall contact rates of the wave 6 gross sample, we do not find any effect of prepaid incentives.

4.2 The Effect of Prepaid Incentives by Wave 5 Outcomes

Looking at the effects on response rates in more detail, we find that both response propensities and incentive effects on participation are very different depending on the previous wave outcome. For those who did not participate in the previous wave, we observe an average wave 6 response rate of about 36% as compared to 86% for wave 5 respondents. Looking at the differences between treatment and control cases within these two groups, we see an increase of 2.3 percentage points for wave 5 respondents, and of about twice that size (4.5 percentage points) for those not responding in wave 5 (Table 1).

Differentiating by the reasons for nonresponse within the group of wave 5 drop-outs, we see that the changed incentive scheme is not particularly effective in bringing back prior "refusers" into the sample. The 2.8 percentage point increase is statistically insignificant and also somewhat below the group average of 4.5 percentage points. Rather, those with an appointment as final status in the prior wave react overproportionately strong to the change in incentives. The increase in response rate of 12.3 percentage points is comparatively large and statistically significant. There is also some indication that those who could not be successfully contacted in the prior wave react positively to the prepaid incentive (an increase of 7.1 percentage points). However, we have to interpret these findings with some caution, as the number of cases in these categories is rather small.

Table 2 Wave 6 Response Rates by Educational Background (N= 12,266)

	postpaid			(partly) prepaid			col	p-
	(n= 6,137)	Interview		(n= 6,129)	Interview		(2) - (1)	value
Lower/middle secondary schooling	*310*	64.8%	*201*	*301*	72.8%	*219*	7.9%	0.049
Lower/middle secondary schooling + vocational training	*3,007*	77.7%	*2,337*	*2,984*	79.7%	*2,378*	2.0%	0.060
University-entrance diploma	*1,036*	77.3%	*801*	*1,061*	78.4%	*832*	1.1%	0.541
University/ of applied science	*1,724*	81.6%	*1,406*	*1,727*	84.1%	*1,453*	2.6%	0.034
No degree	*60*	78.3%	*47*	*56*	57.1%	*32*	-21.2%	0.020

4.3 The Effect of Prepaid Incentives on Lower Educated Sample Members

We also examined the effects of prepaid incentives on one of the major NEPS focus variables, the educational attainment of participants. The response rate of individuals with lower or middle secondary schooling degree, and without a vocational training certificate, is about 8 percentage points higher in the experimental treatment condition (Table 2). The increases in the remaining categories are between 1.1 and 2.6 percentage points and therefore close to the overall effect of prepaid incentives of about 2 percentage points[8].

The overproportionate increase in response of the low educated counteracts, at least somewhat, existing biases. Put differently, "representativity" (in the sense of Bethlehem et al., p. 181) with respect to educational attainment is increased, as the response propensities over the four educational degree categories are more equal in

8 There is a small number of sample members without any schooling or vocational degree ("no degree"). For this group we make the somewhat odd finding of a 21 percentage point decrease in response rates with prepaid incentives. Individuals in this group are on average somewhat older as compared to the rest of the sample and with a migration background more often. In light of the small number of observations we find it difficult to further interpret this finding.

the prepaid than in the postpaid incentive condition.[9] Although the magnitude of this balancing effect is not overly large, it contributes to an enhanced sample composition along the dimension of educational attainment.

4.4 The Effects of Prepaid Incentives on Sample Members with Lower Reading Test Scores

Another core issue of the NEPS adult study is the measurement of participants' competencies, in particular those related to educational success and labor market outcomes like reading or mathematics proficiency (Allmendinger et al., 2011). For our empirical analysis of the NEPS wave 6 incentive experiment we focus on test scores for reading proficiency. This is because reading tests have been administered to the majority of respondents in previous waves, whereas mathematics tests have so far been carried out only for two subsamples of the NEPS adult cohort.[10] In wave 8, reading assessment will be repeated for the first time.

For our analysis of the incentive experiment we distinguish between sample members with no, lower, middle and higher reading test results. For this purpose, we use the available reading competence scores (Pohl & Carstensen, 2012) from prior waves for all cases that participated in the assessment and sort them into three categories, each containing a third of the sample. Those who participated in the respective prior wave but who refused or aborted the competence assessment (or who have been switched to telephone mode) are classified as "no test". Looking at Table 3, we observe that the latter group reacts particularly strong to the changed incentive scheme (5.7 percentage point increase).

One mechanism could be that these respondents sensed an especially high burden of competence assessment participation in previous waves, which are -in part- compensated for by the prepaid incentive when it comes to participation in the current wave. Similarly to the results for educational attainment, we also find here that sample members with the lowest test scores show the largest increase in response rates in reaction to the changed incentive (3.3 percentage points). The effect is on the brink of significance at the 5% level and again not very large. Still, the direction is towards a more balanced sample in terms of reading competence

9 Note, that the concept of "representative" response is always defined with respect to a selected (set of) variable(s). In practice, one calculates the variance of (estimated) individual response probabilities across the various categories of the chosen variable(s). Intuitively: if there turns out to be little variation in the estimated probabilities across categories, this is taken as evidence against a strong relation between (non)response and the characteristic under consideration. Note, too, that our example of considering variation of average response propensities across educational attainment categories is closely related to what Bethlehem et al. (2011) call an unconditional partial R-indicator.

10 There are only 5,645 cases with mathematics scores, which is less than half the number of cases in our analysis sample.

Table 3 Wave 6 Response Rates by Reading Proficiency (N= 9,295)

	postpaid			(partly) prepaid			col	
	(n= 4,650)	Interview		(n= 4,645)	Interview		(2) - (1)	p-value
No test	*891*	68.1%	*607*	*841*	73.8%	*621*	5.7%	0.007
Lower tercile	*1,252*	77.2%	*966*	*1,264*	80.5%	*1,017*	3.3%	0.061
Middle tercile	*1,272*	83.7%	*1,065*	*1,254*	84.6%	*1,061*	0.9%	0.542
Higher tercile	*1,235*	87.0%	*1,074*	*1,286*	86.5%	*1,112*	-0.5%	0.709

scores, thereby again counteracting somewhat the existing biases along this dimension. For the restricted sample with mathematics test scores, we found qualitatively similar -yet even weaker- results as compared to reading test scores (Appendix, Table A2).

4.5 The Effects of Prepaid Incentives on Fieldwork Efficiency

In this section we explore the effects of the switch in incentive scheme on the number of contact attempts per interview as well as on the speed of survey response measured in days since the beginning of the fieldwork. Since nonresponse in the previous wave indicates that sample members may be hard to contact and/or less willing to cooperate, we analyze the effects separately by wave 5 response status.

In our call record files for wave 6, we observe a total of 30,369 contact attempts with sample members being assigned to postpaid incentives, and 30,137 contact attempts with cases being assigned to prepaid incentives. The overall workload, as measured by the total number of attempts, hence does not differ much. However, comparing the average number of contact attempts necessary to obtain an interview, we find that prepaid incentives may in fact reduce the number of unproductive contact attempts.[11] This holds at least for sample members that did not respond in wave 5 (see Table 4). For this group, we find a reduction from, on average, 4.5 contact attempts to 3.9 contact attempts. In relative terms, this amounts to a reduction of almost 13% after all. Amongst sample members that did respond in wave 5 there was no significant difference.

11 From a cost perspective, note, that 90% of all contact attempts per completed interview were personal contact attempts by F2F interviewers since the default mode in wave 6 was CAPI. Out of the 9.713 wave 6 interviews only about 6% (582) were conducted by telephone.

Table 4 Number of Contact Attempts before Interview by Wave 5 Outcomes (N= 9,712)

	postpaid			(partly) prepaid				
	n	Contact attempts	Contact attempts (average)	n	Contact attempts	Contact attempts (average)	col (2) - (1)	p-value
All	*4,797*	14,560	3.04	*4,915*	14,867	3.02	-0.01	0.856
W5 respondents	*4,507*	13,256	2.94	*4,561*	13,478	2.96	0.01	0.821
W5 nonrespondents	*290*	1,304	4.50	*354*	1,389	3.92	-0.57	0.074

Table 5 Number of Days before Interview by Wave 5 Outcomes (N= 9,712), Median

	postpaid		(partly) prepaid			
	n	median	n	median	col (2) - (1)	
W5 respondents	*4,507*	109	*4,561*	105	-4***	(1.466)
W5 nonrespondents	*290*	135	*354*	125	-10**	(4.638)

Standard errors in parentheses; based on median regression analysis
*** p<0.01, ** p<0.05, * p<0.1

For speed of survey response we look at the average (median) number of days between the beginning of the fieldwork and the realized interview. We find a reduction from 109 to 105 days until the interview for wave 5 respondents (see Table 5).

For sample members that did not respond in wave 5, prepaid incentives reduce the number of days until the interview even more, from 135 to 125 days. That shows that sample members respond somewhat faster when receiving prepaid incentives.

5 Conclusion

Summing up, the experimental switch of respondent cash incentives from promised to (partly) prepaid in the wave 6 NEPS adult study certainly brought about positive effects on response rates, sample composition in terms of some key survey variables, and fieldwork efforts. All our findings are in line with the existing literature on incentive effects briefly discussed in the beginning. Nevertheless, the magnitudes were always of rather modest size. Given that the change to the existing incentive scheme can also be considered fairly moderate, this aligns well. In the

end, the shift from postpaid to prepaid respondent incentives was implemented only halfway, as only 10€ of the 20€ available per case were now offered unconditionally. In light of our findings for this "partial" move towards prepaid incentives, one might consider switching to prepaid incentives (for panel cases) entirely in future; although no clear predictions about the various effects of such a move are borne out by our analyses. That said, we agree with the conclusion of Blohm and Koch (2013) that changing respondent incentives is -after all- only *one* way of altering survey operations. Deciding what is the most (cost) effective way of raising response rates and affecting sample composition favorably would, among others, necessitate detailed insights into the true cost structure of fieldwork agencies in combination with further experiments. Despite the limitations in terms of generalizability often associated with such single experiments, we believe that findings for large scale surveys should be documented and made available to other researchers and survey practitioners. In that respect, this note adds one piece of evidence to the literature, especially for the German case as recently summarized by Pforr et al. (2015).

References

Allmendinger, J., Kleinert, C., Antoni, M., Christoph, B., Drasch, K., Janik, F., Leuze, K., Matthes, B., Pollak, R. & Ruland, M. (2011). Adult education and lifelong learning. In H.-P. Blossfeld, H.-G. Roßbach & J. von Maurice (Eds.), *Education as a lifelong process. The German National Educational Panel Study* (Zeitschrift für Erziehungswissenschaft, Sonderheft 14, pp. 283-299). Wiesbaden: VS Verlag.

American Association for Public Opinion Research (2015). *Standard Definitions Final Dispositions of Case Codes and Outcome Rates for Surveys*. 8th ed. Retrieved from https://www.aapor.org/AAPOR_Main/media/publications/StandardDefinitions2015_8theditionwithchanges_April2015_logo.pdf

Antoni, M., Drasch, K., Kleinert, C., Matthes, B., Ruland, M., & Trahms, A. (2010). *Arbeiten und Lernen im Wandel. Teil 1: Überblick über die Studie* (FDZ-Methodenreport 05/2010). Nürnberg: Bundesagentur für Arbeit.

Atrostic, B. K., Bates, N., Burt, G., & Silberstein, A. (2001). Nonresponse in U.S. Government household surveys: Consistent measures, recent trends, and new insights. *Journal of Official Statistics*, *17*(2), 209-226.

Berlin M., Mohadjer L., Waksberg J., Kolstad. A., Kirsch I., Rock D., & Yamamoto K. (1992). An experiment in monetary incentives. In *Proceedings of the Survey Research Methods Section 1992* (pp. 393-398). Alexandria, VA: American Statistical Association.

Bethlehem, J., Cobben, F., & Schouten, B. (2011). *Handbook of nonresponse in household surveys*. New York: John Wiley & Sons.

Blohm, M., & Koch, A. (2013). Respondent incentives in a national face-to-face survey. Effects on outcome rates, sample composition and fieldwork efforts. *Methoden, Daten, Analysen, 7*(1), 89-122.

Blom, A. G., Gathmann, C., & Krieger, U. (2015). Setting up an online panel representative of the general population: the German Internet Panel. *Field Methods*, *27*(4), 391-408.

Blossfeld, H.-P., & von Maurice, J. (2011). Education as a lifelong process. In H.-P. Blossfeld, H.-G. Roßbach & J. von Maurice (Eds.), *Education as a lifelong process. The German National Educational Panel Study* (Zeitschrift für Erziehungswissenschaft, Sonderheft 14, pp. 19-34). Wiesbaden: VS Verlag.

Börsch-Supan, A., Krieger, U., & Schröder, M. (2013). *Respondent incentives, interviewer training and survey participation* (SHARE Working Paper Series 12-2013). Retrieved from http://www.shareproject.org/uploads/tx_sharepublications/WP_Series_12_2013_B%C3%B6rsch-Supan_Krieger_Schr%C3%B6der_02.pdf

De Leeuw, E., & de Heer, W. (2002). Trends in household survey nonresponse: A longitudinal and international comparison. In R. M. Groves, D. A. Dillman, J. L. Eltinge & R. J. A. Little (Eds.), *Survey nonresponse* (pp. 41-54). New York: John Wiley & Sons.

Dillman, D.A., Smyth, J.D., & Christian, L.M. (2014). *Internet, phone, mail and mixed-mode surveys: The tailored design method. 4th edition*. Hoboken, NJ: John Wiley & Sons.

Gouldner, A. (1960). The norm of reciprocity: A preliminary statement. *American Sociological Review*, *25*(2), 161-178.

Groves, R. M., Couper, M. P., Presser, S., Singer, E., Tourangeau, R., Acosta, G. P., & Nelson, L. (2006). Experiments in producing nonresponse bias. *Public Opinion Quarterly*, *70*(5), 720-736.

Groves, R.M., Dillman, D. A., Eltinge, E. J. & Little, R. J. A. (2002). *Survey nonresponse*. New York: John Wiley & Sons.

Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E. & Tourangeau, R. (2004). *Survey methodology*. Hoboken, NJ: John Wiley & Sons.

Groves, R. M., & Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias: A meta-analysis. *Public Opinion Quarterly*, *72*(2), 167-189.

Groves R. M., Singer, E. & Corning, A. (2000). Leverage-Salience Theory of Survey Participation: Description and an Illustration. *Public Opinion Quarterly*, 64(3), 299-308.

infas Institut für angewandte Sozialwissenschaft (2009). *Nationales Bildungspanel (NEPS) Etappe 8: Adult Education and Lifelong Learning. Erste Welle der Erwachsenenetappe* (Methodenbericht Machbarkeitsstudie Dezember 2009). Bonn: Institut für angewandte Sozialwissenschaft.

James, T. L. (1997). Results of the wave 1 incentive experiment in the 1996 Survey of Income and Program Participation. In *Proceedings of the Survey Research Methods Section 1997* (pp. 834-839). Alexandria, VA: American Statistical Association.

Jäckle, A., & Lynn, P. (2008). Respondent incentives in a multi-mode panel survey: Cumulative effects on nonresponse and bias. *Survey Methodology*, *34*(1), 105-117.

Kleinert, C., Christoph, B. & Ruland, M. (2015). Auswirkungen der Administration von Kompetenztests im Rahmen einer Panelerhebung für Erwachsene. Ergebnisse eines Experiments in Startkohorte 6 des Nationalen Bildungspanels (NEPS). In J. Schupp & C. Wolf (Eds.) *Nonresponse Bias. Qualitätssicherung sozialwissenschaftlicher Umfragen*. (pp. 359-382). Wiesbaden: Springer VS.

Laurie, H. (2007). *The effect of increasing financial incentives in a panel survey: An experiment on the British Household Panel Survey, Wave 14* (ISER Working Paper 2007-5). Colchester: University of Essex.

Laurie, H., & Lynn, P. (2009). The use of respondent incentives on longitudinal surveys. In P. Lynn (Ed.), *Methodology of longitudinal surveys* (pp. 205-233). Chichester: John Wiley & Sons.

Leibniz-Institut für Bildungsverläufe e.V. (2015). *Startkohorte 6: Erwachsene (SC6). Studienübersicht. Wellen 1 bis 5* (Documentation). Bamberg: Leibniz-Institut für Bildungsverläufe e.V.

Mack, S., Huggins, V., Keathley, D., & Sundukchi, M. (1998). Do monetary incentives improve response rates in the Survey of Income and Program Participation? In *Proceedings of the Survey Research Methods Section 1998* (pp. 529-534). Alexandria, VA: American Statistical Association.

Mann, S. L., Lynn, D. J., & Peterson A. V. (2008). The "downstream" effect of token prepaid cash incentives to parents on their Young Adult Children`s Survey participation. *Public Opinion Quarterly, 72*(3), 487-501.

Mercer, A., Caporaso, A., Cantor, D., & Townsend, R. (2015). How much gets you how much? Monetary incentives and response rates in household surveys. *Public Opinion Quarterly, 79*(1), 105-129.

Pew Research Center. (2012). *Assessing the representativeness of public opinion surveys*. Washington, DC: Pew Research Center. Retrieved from http://www.people-press.org/files/legacypdf/Assessing%20the%20Representativeness%20of%20Public%20Opinion%20Surveys.pdf

Pforr, K., Blohm, M., Blom, A. G., Erdel, B., Felderer, B., Fräßdorf, M., … Rammstedt, B. (2015). Are incentive effects on response rates and nonresponse bias in large-scale, face-to-face surveys generalizable to Germany? Evidence from ten experiments. *Public Opinion Quarterly*, 79(3), 740-768.

Pohl, S., & Carstensen, C. H. (2012). *NEPS technical report – Scaling the data of the competence tests* (NEPS Working Paper No. 14). Bamberg: Leibniz-Institut für Bildungsverläufe e.V.

Rodgers, W.L. (2002). Size of incentive effects in a longitudinal study. In *Proceedings of the Survey Research Methods Section 2002* (pp. 2930-2935). Alexandria, VA: American Statistical Association.

Rodgers, W.L. (2011). Effects of increasing the incentive size in a longitudinal study. *Journal of Official Statistics, 27*(2), 279-299.

Ryu, E., Couper, M. P., & Marans, R. W. (2005). Survey incentives: Cash vs. in-kind; face-to-face vs. mail; response rate vs. nonresponse error. *International Journal of Public Opinion Research*, *18*(1), 89–106.

Scherpenzeel, A., & Toepoel, V. (2012). Recruiting a probability sample for an online panel: Effects of contact mode, incentives, and information. *Public Opinion Quarterly, 76*(3), 470-490.

Schnell, R. (1997). *Nonresponse in Bevölkerungsumfragen. Ausmaß, Entwicklung und Ursachen*. Opladen: Leske und Budrich.

Schupp, J. & Wolf, C. (2015). *Nonresponse Bias. Qualitätssicherung sozialwissenschaftlicher Umfragen*. Wiesbaden: Springer VS.

Singer, E. (2002). The use of incentives to reduce nonresponse in household surveys. In R. M. Groves, D. A. Dillman, J. L. Eltinge & R. J. A. Little (Eds.), *Survey nonresponse* (pp. 163-178). New York: John Wiley & Sons.

Singer, E., van Hoewyk, J., Gebler, N., Raghunathan, T., & McGonagle, K. (1999). The effect of incentives on response rates in interviewer-mediated surveys. *Journal of Official Statistics, 15*(2), 217-230.

Willimack, D. K., Schumann, H., Pennell, B.-E., & Lepkowski, J. M. (1995). Effects of a prepaid nonmonetary incentive on response rates and response quality in a face-to-face survey. *Public Opinion Quarterly, 59*(1), 78-92.

Yu, J., & Cooper, H. (1983). A quantitative review of research design effects on response rates to questionnaires. *Journal of Marketing Research, 20*(1), 36-44.

Zagorsky, J. L., & Rhoton, P. (2008). The effects of promised monetary incentives on attrition in a long-term panel survey. *Public Opinion Quarterly, 72*(3), 502-513.

Zinn, S., Aßmann, C., & Würbach, A. (2015). *Sampling and weighting the sample of the adult cohort of the National Educational Panel Study (Wave 2 to 5). Technical Report on SUF SC6, Version 5.0.0* (Technical Report). Bamberg: Leibniz-Institute for Educational Trajectories.

Appendix

Table A1

	All		postpaid				(partly) prepaid				Interview: col (2) - (1)	
	%	n	%	n	Interview %	n	%	n	Interview %	n	%	p-value
Sex												
Male	49.8	6,110	49.2	3,026	77.5	2,345	50.3	3,084	79.1	2,439	1.6	0.128
Female	50.2	6,170	50.8	3,120	78.6	2,453	49.7	3,050	81.2	2,476	2.6	0.019
valid	*100.00*	*12,280*	100.00	*6,146*			100.00	*6,134*				
Age												
>30	3.4	417	3.6	219	66.2	145	3.2	198	69.7	138	3.5	0.440
30-39 years	15.9	1,951	15.8	971	72.6	705	16.0	980	72.0	706	-0.6	0.774
40-49 years	24.8	3,042	24.9	1,532	77.3	1,185	24.6	1,510	79.9	1,207	2.6	0.071
50-59 years	33.1	4,068	33.3	2,045	80.7	1,651	33.0	2,023	82.6	1,670	1.8	0.133
60+ years	22.8	2,800	22.4	1,378	80.6	1,111	23.2	1,422	83.9	1,193	3.3	0.024
valid	*100.00*	*12,278*	100.00	*6,145*			100.00	*6,133*				
Migration background												
No	84.7	10,401	84.8	5,209	79.2	4,124	84.6	5,192	81.2	4,214	2.0	0.012
Yes	15.3	1,879	15.2	937	71.9	674	15.4	942	74.4	701	2.5	0.232
valid	*100.00*	*12,280*	100.00	*6,146*			100.00	*6,134*				

Table A1 continued

	All		postpaid				(partly) prepaid				Interview: col (2) - (1)	
	%	n	%	n	Interview %	n	%	n	Interview %	n	%	p-value
Employment status												
(Self-)employed	76.8	9,143	77.0	4,591	80.3	3,686	76.5	4,552	82.1	3,739	1.9	0.027
Unemployed	4.0	478	3.9	234	79.5	186	4.1	244	75.0	183	-4.5	0.213
Retired	12.2	1,449	11.9	708	85.6	606	12.5	741	87.9	651	2.3	0.204
Family care	4.5	531	4.6	273	76.2	208	4.3	258	86.0	222	9.9	0.004
Education/civil service	1.1	128	1.0	60	61.8	37	1.1	68	61.8	42	0.1	0.991
Other	1.5	183	1.6	95	78.9	75	1.5	88	87.5	77	8.6	0.138
valid	*100.00*	*11,912*	*100.00*	*5,961*			*100.00*	*5,951*				
Marital status												
Single	16.1	1,974	16.2	997	77.1	769	15.9	977	77.8	760	0.7	0.748
Married, living together	64.7	7,944	64.6	3,967	79.3	3,144	64.8	3,977	81.7	3,251	2.5	0.007
Married, living apart	2.1	257	2.2	132	81.8	108	2.0	125	84.8	106	3.0	0.534
Partner, living together	11.2	1,373	11.2	690	74.6	515	11.1	683	78.0	533	3.4	0.124
Partner, living apart	6.0	732	5.9	360	72.8	262	6.1	372	71.2	265	-1.5	0.643
valid	*100.00*	*12,280*	*100.00*	*6,146*			*100.00*	*6,134*				
Children in household												
None	49.0	4,179	48.3	2,050	86.8	3,684	49.7	2,129	89.0	3,810	2.3	0.002
0 to 3 years old	7.6	650	7.3	308	88.6	273	8.0	342	88.3	302	-0.3	0.892
4 to 15 years old	30.2	2,576	30.5	1,295	87.0	1,127	29.9	1,281	86.9	1,113	-0.1	0.919
16+ years old	33.2	2,827	33.6	1,426	86.0	1,227	32.6	1,401	87.4	1,224	1.3	0.318

Table A1 continued

	All		postpaid				(partly) prepaid				Interview: col (2) - (1)	
	%	n	%	n	Interview %	n	%	n	Interview %	n	%	p-value
Household income												
Less than 1,500	11.1	1,291	11.1	652	74.7	487	11.0	639	72.9	466	-1.8	0.472
1,500 to 3,000	33.8	3,943	33.8	1,976	76.4	1,509	33.9	1,967	80.2	1,577	3.8	0.007
More than 3,000	55.1	6,420	55.1	3,225	79.8	2,574	55.1	3,195	82.0	2,620	2.2	0.016
valid	*100.00*	*11,654*	*100.00*	*5,853*			*100.00*	*5,801*				
BIK												
Up to 50,000	24.2	2,975	24.7	1,516	79.4	1,203	23.8	1,459	80.7	1,178	1.4	0.424
50,000 to 100,000	10.9	1,340	10.6	654	76.6	501	11.2	686	79.6	546	3.0	0.193
100,000 to 500,000	32.4	3,975	32.6	2,001	77.3	1,547	32.2	1,974	80.4	1,588	3.1	0.011
More than 500,000	32.5	3,990	32.1	1,975	78.3	1,547	32.9	2,015	79.6	1,603	1.2	0.348
valid	*100.00*	*12,280*	*100.00*	*6,146*			*100.00*	*6,134*				

Table A2 Wave 6 Response Rates by Mathematics Proficiency (N= 5,645)

	postpaid			(partly) prepaid				
	(n= 2,811)	Interview %		(n= 2,834)	Interview %		col (2) - (1)	p-value
No test	600	72.0	*432*	633	75.2	*476*	3.2%	0.154
Lower tercile	747	82.6	*617*	723	84.9	*614*	2.3%	0.225
Middle tercile	709	83.4	*591*	765	84.7	*648*	1.3%	0.505
Higher tercile	755	87.0	*657*	713	87.5	*624*	0.5%	0.784