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Cash vs. vouchers vs. gifts in web surveys of a mature panel study—Main effects in a long-term incentives experiment across three panel waves

Rolf Becker*, Sara Möser, David Glauser

University of Bern Department of Sociology of Education, Fabrikstrasse 8, CH–3012, Bern, Switzerland

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ABSTRACT

In this study, we evaluate short- and long-term effects of three different prepaid incentives: a ballpoint-pen (gift worth approximately 2 Swiss francs), a voucher (cash card worth 10 Swiss francs) and cash (a 10-Swiss-francs' banknote) on young panellists' cooperation and response rate in three waves of a mature panel study with a sequential multi-mode design (web-based online survey, CATI, and PAPI). The survey experiment involved an alternative procedure to analyse the effect of different types of prepaid incentives, taking selective attrition into account as well as considering problems related to causal inference. The subjects were students, from randomly-selected school classes, who had finished their compulsory school in 2013. The findings are clear: cash provides the strongest direct, positive effect on the overall response rate and also on the latency until response after first contact. The other incentives did not work as efficiently as did cash. Additionally, cash is the most likely to minimise social selectivity in response. Finally, cash provides the potential to convert refusals in previous waves into cooperation.

1. Introduction

In social sciences, panel studies have become increasingly prominent in gathering longitudinal data on trajectories in individuals' life courses (Blossfeld et al., 2011), their developments (Blossfeld et al., 2009), and social processes to explain structural changes (Wagner et al., 2007). However, sociologists deplore declining response rates in social-scientific surveys across historical periods (e.g., Ernst Stähli and Joye, 2016; Pforr et al., 2015;Dillman et al., 2014; Andreβ et al., 2013; Groves, 2006, 2004: 145–155; Schnell, 1997; Smith, 1995: 157). This problem is particularly important in panel surveys, since even low wave-on-wave nonresponse rates can lead to substantial losses in sample size (Jäckle and Lynn, 2008: 105). A reduced sample size increases the standard errors used in statistical multivariate estimations (Goldenberg et al., 2009). Because dropout from a panel study is mostly socially selective (Voorpostel, 2010; Lipps, 2007; Behr et al., 2005), the increasing panel attrition across waves might result in biased findings (Lugtig, 2014). It is often shown that respondents with low educational attainment are typically more likely to drop out of panel surveys (Becker and Glauser, 2018; Jäckle and Lynn, 2008: 107). Additionally, nonresponses exacerbate multivariate analysis of processes in terms of biased estimations with reduced statistical precision (e.g., Groves and Peytcheva, 2008) due to right censoring of interesting trajectories (Becker and Glauser, 2018; Blossfeld et al., 2007). Thus, due to cumulative dropout from a panel study and its consequences for statistical analysis of longitudinal data, observing individuals in a panel design is challenging and costly in terms of the number of individuals lost in subsequent panel waves (Andreβ et al., 2013).

* Corresponding author.
E-mail addresses: rolf.becker@edu.unibe.ch (R. Becker), sara.moeser@edu.unibe.ch (S. Möser), david.glauser@edu.unibe.ch (D. Glauser).

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To prevent unit nonresponse and panel attrition, several strategies are used to optimise the response and retention rate (Pforr et al., 2015; Laurie et al., 1999). One of the most efficient and effective strategies is using prepaid monetary incentives to both increase the interviewees' willingness to take part in the survey and enhance the response rate of less-motivated respondents (Ernst Stähli and Joye, 2016). The success of using "incentives as a motivator for survey participation" (Singer and Bossarte, 2006: 412) has been confirmed in a huge number of controlled experiments, but less is known about their effects in online surveys embedded in a mature panel study (Becker and Glauser, 2018; Pforr et al., 2015; Singer and Ye, 2013; Scherpenzeel and Toepoel, 2012; Sánchez-Fernándenz et al., 2010; Goldenberg et al., 2009; Singer and Couper, 2008; Göritz, 2006; Singer et al., 2000, 1999b; Warriner et al., 1996; Church, 1993). It is frequently found that monetary incentives generate higher response rates than do no or non-monetary incentives (Pforr et al., 2015; Becker and Mehlkop, 2011; Singer et al., 1999a; Warriner et al., 1996) and that unconditionally prepaid cash incentives are more effective in terms of increased response rates than are promised incentives (Ernst Stähli and Joye, 2016: 430; Becker and Mehlkop, 2011: 8; Singer et al., 2000: 186; Warriner et al., 1996). This is also valid for web-based surveys. For example, Gajic et al. (2012) found higher contact and response rates in a web-based survey.

Furthermore, there is no strictly linear correlation of response rate and value of a cash incentive. In fact, one can even notice a declining effect of the values given (Dillman et al., 2014). Controlling for respondents' effort (e.g., length and complexity of the questionnaire; time exposure; mode of interview), rather low amounts are sufficient to stimulate interviewees' responses (Szelényi et al., 2005). For Germany or Switzerland, as two examples, it has been found that either 5 Euros (Mehlkop and Becker, 2007) or 10 Swiss francs (Becker and Mehlkop, 2011) seem to be enough to increase the respondents' survey participation (Scherpenzeel and Toepoel, 2012). Few experimental studies exist for panel surveys (Pforr et al., 2015; Lipps, 2010; Laurie and Lynn, 2009; Jäckle and Lynn, 2008), but these provide rather similar findings – namely, that incentives can improve sample compositions in panel surveys by stimulating responses from interviewees with disproportionately low participation rates, such as individuals with lower levels of education or those originating from lower social classes or living in households with lower economic welfare (Becker and Glauser, 2018; Laurie and Lynn, 2009; Jäckle and Lynn, 2008; Ryu et al., 2005; Singer et al., 2000, 1999a). Pforr et al. (2015: 24) stress that a later rise in incentive values increases response rates in the wave of implementation (see Ryu et al., 2005). They found "weak support for a constant increase in retention rates when incentives are consistently offered across multiple waves. Decreasing incentives in a later wave does not decrease retention rates" (Pforr et al., 2015: 24).

Although previous research has extensively analysed whether prepaid monetary incentives have a positive effect on the response rate (Singer and Couper, 2008), there is still uncertainty about the reliability of these findings. Since most research is based on controlled experiments that distinguish between randomised treatment and non-treatment groups, we have to deal with the fundamental problem of causal inference (Holland, 1986). As a result, we do not know whether respondents who did not receive a prepaid cash incentive would have taken part in a panel survey if they had received this incentive unconditionally. Would they have participated if they had received a non-monetary gift instead of cash? And would they have participated if they had received an equivalent voucher instead of money? To overcome the methodological limitations of such experiments, we suggest another design in the context of a mature panel study with several waves.

The remainder of the article is organised as follows. In section 2, the theoretical framework is presented alongside a summary of the state of research related to the effects of prepaid incentives on response rates in panel surveys. Section 3 provides a description of the data set, variables, and statistical procedures. The findings are presented in section 4, while conclusions are given in the final section.

2. Theoretical background

2.1. How to explain (non-)response and the efficiency of prepaid incentives

The use of respondent incentives is an important element of the strategy to minimise unit nonresponse and panel attrition (Dillman et al., 2014). Why do some respondents answer and why do some respondents not answer in surveys, even after having received an incentive? And why do cash incentives affect the target persons' response more strongly than do other incentives? Answers to these questions are often sought by applying different rational action theories predicting different outcomes of prepaid monetary incentives (e.g., Singer and Bossarte, 2006; Becker and Mehlkop, 2011).

According to the *economic exchange theory*, for example, the respondents' rational cost-benefit calculation in deciding whether to participate in a survey is the key mechanism behind response or nonresponse. To compensate for the respondents' efforts and time devoted to answering the questionnaire, it seems to be useful to enclose a prepaid incentive in an advance letter. The incentive should minimise the impact of costs and increase the impact of benefits in the interviewees' decision for taking part in the survey. This might be true especially in web surveys, where the interviewee is asked to complete a questionnaire without the assistance of an encouraging interviewer. To raise the expected benefits for the participation in this survey mode, extrinsic incentives seem to be a necessity (Becker and Mehlkop, 2011). According to this type of a restrictive rational choice theory, however, it would be rational for interviewees to keep the prepaid money without giving any response. As they do not have to expect any consequences if they take the money without any consideration, refusing to participate is appealing.[1] In contrast to this assumption, the opposite result is regularly

[1] At first glance, it seems to be useful to promise money as a return for response. Compared to prepaid cash, the improvement of response rate is mostly either insubstantial or counterproductive (Singer and Ye, 2013). For the case of promised money, it could be assumed that most respondents' have no trust in the researchers' return service. Respondents might be largely uncertain whether researchers actually pay for their response (Mehlkop and Becker, 2007).

observed: namely, that most of these interviewees are not defective in this exchange situation (e.g., Pforr et al., 2015).

This paradox was partially dissolved by a revision of the restrictive economic approach. According to the *theory of* "*bounded rationality*" (Simon, 1982), many individuals asked for an interview are rather indecisive concerning a survey response because they are unable to assess the costs and benefits accurately due to either missing or incomplete information on an interview situation. A prepaid monetary incentive is useful, therefore, because it fuels respondents' extrinsic motivation to the threshold where it surpasses their indecisiveness. On the other hand, according to the original economic exchange theory, it would be plausible that, the higher the amount of cash incentive, the more likely the respondents are to take part in a survey. However, in several studies and meta-analyses, a curvilinear relationship between the amount of money and response rate are reported (Armstrong, 1975; Fox et al., 1988; James and Bolstein, 1992; Warriner et al., 1996; Saunders et al., 2006; Becker and Mehlkop, 2011; Pforr et al., 2015). Drawbacks from monetary incentives could be explained by the *social-psychological mechanism of reactance* (Frey, 1997: 23). That means that the target person's intrinsic motivation is undermined by an external intervention, which is perceived as irrespective and unappreciative of that individual's motives. As a consequence, individuals minimise their effort based on this devalued self-evaluation, resulting in their non-response. Furthermore, the curvilinear relationship between the amount of money and the response rate could be explained by the *theory of subjectively expected utility*, which is another enlightened sociological version of rational choice theory (Becker and Mehlkop, 2011). From the interviewees' subjective view, an inappropriately high amount of money will alter their cognitive frame for the definition of the interview situation. If the prepayment is too high, respondents will perceive the exchange as a business act. In line with the social-psychological theory of reactance, respondents attempt to restore their freedom of choice either to participate or to refuse. In the case of overpayment, respondents are likely to refuse participation. Therefore, to prevent the interview situation from being perceived as an economic exchange, the amount of prepaid money should correspond to the equivalent value of respondents' effort (Groves et al., 2000). The prepaid monetary incentive should not be too precious, because, otherwise, the respondents feel that they are not able to deliver an adequate payback and break off the exchange relationship (Fox et al., 1988). However, to our knowledge, there is no empirical based idea as to the optimum amount of prepaid monetary incentives for web-based online surveys (Saunders et al., 2006).

The economic exchange approach's theoretical implication of strict rationality, in that prepaid monetary incentives do not contribute positively to the overall response rate, is questioned from the theoretical perspective of both the *social exchange theory* (Dillman, 2000) and the *theory of subjectively expected utility* considering the *individuals' framing* of an interview (Kroneberg and Kalter, 2012; Becker and Mehlkop, 2011). Whereas the economic exchange theory emphasises the impact on the target persons' extrinsic motivation by money, the social exchange theory, alternatively, focuses on the individuals' intrinsic motivation for taking part in a social-scientific survey (Dillman et al., 2014). It has been repeatedly pointed out that – by supplementing respondent's intrinsic motivation with extrinsic incentives – the response rate is increasing due to this confidence-building measure. In this respect, prepaid monetary incentives are the researchers' investment in mutual trust, which is necessary for social interaction between interviewer and interviewee. On the one hand, unconditional prepaid cash is a "*symbol of trust*" (Dillman et al., 2014). "By enclosing a 'token of appreciation', the researcher is demonstrating trust that the potential respondent will answer the survey. Individuals are motivated to act by the return they expect and receive from others, so trust on the part of the giver is a necessary component of social exchange" (Ryu et al., 2005: 91). According to Millar and Dillman (2011), sending cash incentives in advance deemphasises the purely economic "payment" context of incentives and, instead, creates a type of social encouragement that stresses the importance of the survey.[2] Experiments by LaRose and Tsai (2014: 113) provide evidence that respondents, therefore, need to receive the "gift" materially (Becker and Mehlkop, 2011). On the other hand, due to the *norms of reciprocity*, interviewees feel obliged to respond (Becker and Glauser, 2018; Dillman et al., 2014; Scherpenzeel and Toepoel, 2012; Becker and Mehlkop, 2011; Diekmann, 2004; Gouldner, 1960; Mauss, 1984 [1924]). Cooperation in a survey is their counter-gift to the researcher's gift (Becker and Glauser, 2018). However, since there is no research on whether respondents actually feel an obligation to respond and to cooperate with researchers to discharge the debt in relation to the advance payment (Singer and Ye, 2013), it could be assumed that an incentive might also substitute for a lack of motivation to participate for other reasons, such as civic duty or interest in the topic (Singer and Couper, 2008: 50).[3] According to this theoretical approach, the response rate is higher for individuals who have received prepaid monetary incentives unconditionally, compared to individuals who have either received no incentive or have received an incentive provided that they filled out the questionnaire.

Considering the theory of subjectively expected utility, which is a general theory of rational action, including social-psychological theories on individuals' perception and cognition of the social situation of an interview and, in particular, the role of prepaid incentives, it is assumed that an unconditional prepaid monetary incentive increases the "chance" (Weber, 1922) of response in terms of the respondents' inclination to cooperate in the sense of either instrumentally (*zweckrational*) or value-driven (*wertrational*) social action (Kroneberg and Kalter, 2012; Kroneberg, 2007). The effect of cash might be larger than are the effects of other incentives due to the universalistic character of money. The differences in respondents' likelihood to respond depend not only on material differences in respect of incentives but also – from the *respondents' subjective view and evaluation* – on differences in the subjective values of the incentives. However, this could explain why prepaid cash is the most efficient incentive (Pforr et al., 2015: 24), in contrast to

[2] Therefore, in accordance with the social exchange theory (Dillman et al., 2014), it has to be considered that, "if the incentive is seen as preceding a request that is disproportionately large in comparison, the incentive will be ineffective" (Ryu et al., 2005: 92).

[3] Additionally, to mention the mechanism, the possible normative sanction for nonresponse, as well as the shame due to failure to take part, results in the subjects' cognitive dissonance (Festinger, 1957). This dissonance, due inherently to either wasting the gift or being dishonest will be solved by accepting the norm of reciprocity and the actual cooperation with the researcher (Becker and Glauser, 2018; Becker and Mehlkop, 2011).

either quasi-resp. Semi-monetary incentives, such as a cash card of a hypermarket chain (Becker and Glauser, 2018), or non-monetary gifts, such as a ballpoint pen (Ernst Stähli and Joye, 2016: 430; Warriner et al., 1996).

Indeed, this is in line with alternative sociological interpretations. One famous interpretation is provided by the German sociologist Georg Simmel (1900) and his seminal work on the philosophy of money. What counts is the subjective value of money; i.e., the respondents' view on the good they have received. According to Simmel (1900), money is the most general form of social interaction. Money has a double function. On the one hand, it demonstrates the relative price of a good and, on the other hand, it has a value itself, since it is applicable for each purpose everywhere and at all times. This means that "cash has a universally understood value" (Ryu et al., 2005: 91). In contrast to other incentives, such as a voucher or ballpoint pen, money is a universal medium, and, therefore, it is of interest to each interviewee, whatever their social sphere. Furthermore, money is an absolute medium for exchange since it is indeterminate in regard to its use. Modern money can be used for any exchange, i.e., its mean is absolutely open. The use of money is not related to dates and deadlines. In this way, social certainty will be created independent of presence and future. Money contributes to the objectification of social interactions between one human being and another human being. Trust in money is universal, since it is the means of economic interactions.

This is not true for other unconditional material incentives, such as a voucher, which could be used to buy goods and services. Becker and Glauser (2018) found that a cash card of a value of 10 Swiss francs for a duopolistic hypermarket in Switzerland had a positive effect on the young panellists' response rate (the increase in response rate was 7 percentage points), whereas, to give another example, another experiment with prepaid cash (10 Swiss francs) resulted in an increase of 24 percentage points (Becker and Mehlkop, 2011). According to Ryu et al. (2005), this difference can be explained by the fact that cash has an immediate value, and, in contrast to other incentives, such as a voucher, cash has many different uses. The value of such a cash card for a hypermarket may depend on the degree to which one is interested in going to the (online or local) hypermarket shop; the degree to which one might prefer to use this voucher, due to the individual identification with this hypermarket instead of other supermarkets; and the extent to which one has access to the (online) shop. Compared to money, such vouchers are not a universalistic medium. This is true for non-monetary gifts, such as ballpoint pens, which have an important, albeit restricted, application. If this argument on the subjective value of money is true, it could be assumed that individuals from hard-to-reach households with lower socio-economic status and related low levels of economic prosperity would be more likely to be sensitive to the cash they receive from researchers, both immediately and without any terms (Martinez-Ebers, 1997). This might minimise responses being biased by social origin or socio-economic status.

Finally, it has to be stressed that, due to missing empirical evidence, it still remains to be resolved whether cost-benefit calculation, reciprocity, trust, and valuation of material incentives are actually the main mechanisms important for individuals' co-operation and response in a social-scientific survey. However, in survey research, the previous theoretical background might be useful for deriving plausible hypotheses, for developing an adequate research design, and for both understanding and interpreting the empirical findings on incentive manipulations in surveys.

2.2. How to reveal the real effect of prepaid incentives in panel studies with online surveys

As already mentioned above, the results of incentive manipulations are regularly observed in a classical experimental design using randomised experimental and control groups as well as controlled assignment of treatments. However, the question arises as to how we can overcome the fundamental problem of causal inference, in addition to selection bias, due to flawed randomisation. In our case, we are not able to isolate the individual causal effect δ_i of unconditional prepaid incentives – $\delta_i = Y_i^1 - Y_i^0$, whereby Y_i^1 = potential outcome for individuals i with treatment and Y_i^0 = potential outcome for individuals i without treatment –on individuals' response rates, since it is possible to observe only a single event D for an individual – $Y = DY^1 - (1 - D)Y^0$ – while the other event for the same individual is a counterfactual (Angrist and Pischke, 2009). Given that we can observe an individual i only in one situation at the same time, this fundamental problem of causal inference means that it is not possible to isolate the individual causal effect δ_i since we have just half of the necessary information we need to identify the total individual causal effect. In practice, we have to substitute missing information with assumptions. Of course, from the sociological perspective, we are not interested in the individual but in the average treatment effect (ATE). So, ATE will be calculated instead of the individual causal effect: $ATE = E[\delta] = E[Y^1 - Y^0] = E[Y^1] - E[Y^0]$, i.e., the difference of average treatments of the control and experimental groups will be taken into account by comparing like with like in cross-section – $ATE = EY^1|D = 1 - EY^0|D = 0$. The rationale behind this is that randomisation solves the problem of missing information, because, in an ideal situation, the expected value of the unobserved individual effect is equivalent to ATE. However, it has to be stressed that this is an expected value that may not correspond with the de facto value in most cases. Therefore, it is, at least, interesting to reduce the uncertainty about ATE via an alternative experimental procedure.

As seen above for the recent state of research, different prepaid incentives – such as money, vouchers, pens, or other non-monetary gifts – will be considered in a cross-sectional survey or in a single panel wave in contrast to non-treatment. However, to reveal the effect of such prepaid incentives, it is not necessary to distinguish between treatment and non-treatment if the design of a multiple-wave panel is considered. Due to the empirical findings discussed above, it is taken for granted that prepaid material incentives always affect positively and significantly the response rate of treated compared to non-treated individuals. Therefore, it is only interesting which of the different incentives, particularly, the prepaid monetary incentive compared to other incentives, work preferably in a panel survey for most of the same sample.

Therefore, for our purpose, we suggest another design by using the longitudinal character of a mature panel study with seven waves (Becker and Glauser, 2018). We do not observe the ATE separately for control and experimental groups at the same time in a single panel

wave, and we do not split our sample in each of the panel waves randomly into these two groups. Considering that unconditional prepaid material incentives work immediately, there is no need for a control group indicating non-treatment.[4] However, taking three different incentives into account, we distinguish three waves in regard to distributing the treatments. The first incentive, a voucher (cash card for a Swiss hypermarket, worth 10 Swiss francs), was awarded to each of the contactable interviewees as part of the fifth wave of our panel study. In the sixth wave, they received a fancy gift (a ballpoint pen with a gravure: www.dab.edu.unibe.ch), and, finally, in the seventh panel wave, they received prepaid money (10 Swiss francs in cash). Please note that each of the incentives is, as recommended by Dillman et al. (2014), unconditional. The interviewees received their incentive enclosed in the advance letter, since the response rates are significantly higher when using unconditional incentives compared to either promised incentives or incentives sent via the internet (Göritz, 2004, 2006; Scherpenzeel and Toepoel, 2012: 472–474). As suggested by Laurie and Lynn (2009) for longitudinal surveys, we choose to change the value of the incentives offered between waves and to vary the form the incentive takes, switching from a voucher (worth 10 Swiss francs) to a non-monetary gift (worth approximately 2 Swiss francs) and to cash (a 10 Swiss francs' banknote).[5] In this way, we try to reveal the relative effectiveness of possible combinations over panel waves. It is assumed that prepaid incentives with a relatively low value result in either significant improvements in the response rates of a mature panel or in the maintenance of relatively high response rates, at least across panel waves. In this respect, we agree with Laurie and Lynn (2009: 230) that small gifts given regularly across waves are more effective than is an occasional large gift given in the first wave (see also: Becker and Glauser, 2018). As mentioned by Laurie and Lynn (2009: 230), "in particular, we still know relatively little about the effect of changing incentive amounts (…) during a longitudinal survey, targeting particular groups based on demographic characteristics or previous response history, the use of differential incentive amounts for different cases or circumstances and the longer-term effect of incentives on attrition and bias".

Overall, the three experimental groups comprise all the contactable interviewees. In this way, we seek to overcome the fundamental problem of causal inference in the setting of a controlled survey experiment. This means that we do not have to make any assumptions regarding counterfactuals (Morgan and Winship, 2007) due to an exhausted set of options. Additionally, because of this design, causal inference will be revealed from a series of treatments for the same individuals at different points in time (Pötter and Blossfeld, 2001; Blossfeld and Rohwer, 1997). Thus, it is possible to take the main theoretical assumptions of rational action theories, such as the economic exchange theory, social exchange theory, and theory of subjectively expected utility, into account (Becker and Mehlkop, 2011).

3. Panel study, variables, and statistical procedures

3.1. DAB panel study

The experiment was conducted in the context of a panel study on determinants of educational choice and vocational training opportunities (Becker and Glauser, 2018; Glauser and Becker, 2016; Glauser, 2015).[6] To reconstruct educational trajectories prospectively, the data collection was limited to juveniles born around 1997 and who were enrolled in regular classes in public schools in German-speaking cantons of Switzerland. The panel data are based on a random stratified gross sample of 296 school classes (8th grade), out of a total universe of 3045 classes. After contacting the headmasters and teachers, 215 out of 296 school classes were ready to participate in the online survey in the first wave (Glauser, 2015).

In the first three waves, the students were interviewed in the context of their school class by means of an online questionnaire when they were in the middle of the eighth grade (Wave 1: January–February 2012), as well as at the beginning (Wave 2: August–October 2012) and at the end (Wave 3: May–June 2013) of the ninth grade (Table 1). The response rates – RR2 suggested by AAPOR (2015: 52) – amounted to between 90 and 96 per cent realised by web-based surveys.

Fifteen months' after leaving compulsory school, the contactable interviewees, who, therefore, had to be pursued individually, were interviewed again in the fourth wave (October–November 2014). The total response rate was approximately 84 per cent, if the interviews by the web survey and the CATI survey are taken into account.[7] In the online mode only, 52 per cent of the contactable individuals completed the web-based questionnaire.[8] Furthermore, it should be noted that a controlled method experiment was conducted in this wave (Becker and Glauser, 2018). One half of these individuals received a voucher, i.e., a hypermarket cash card worth 10 Swiss francs, enclosed in the advance letter as an unconditional prepaid incentive. The other half of the individuals made up

[4] As a useful by-product of this procedure, biased results due to comparison choice (or control group) bias resulting from flawed randomisation of control and experimental groups do not occur. Note that, theoretically, the randomisation has to be repeated infinitely to be certain that the random result is optimal in respect of controlling for confounding factors.

[5] There is a pragmatic reason why the 10 francs' bill is used. In Switzerland, this is the lowest available amount in paper money. The light weight of the banknote minimises postage fees, which are usually quite considerable for priority mailing.

[6] The data sets of the first four waves are already available at FORS (https://forsbase.unil.ch/project/study-public-overview/14834/0/). The data of the experiment may be requested from the authors.

[7] The fieldwork was carried out according to the tailored design method suggested by Dillman (2000). In our panel study, due to efficiency and methodological advantages, the online mode – initially preferred by the youths (Smyth et al., 2014: 142) – was chosen in each of the waves (Couper and Bosnjak, 2010; Heerwegh, 2009).

[8] Each of the online surveys and mail surveys (PAPI) was realised by the Department of Sociology of Education at the University of Bern using the "UniPark EFS Survey" in Waves 4, 6, and 7, and the "LimeSurvey" in Wave 5. The CATI was realised by a commercial polling agency (M.I.S Trend in Lausanne) in Wave 4, by the Department of Sociology of Education at the University of Bern in Wave 5, by another commercial polling agency (LINK in Lucerne) in Wave 6, and by M.I.S Trend again in Wave 7. In each of the waves and modes, a university was identified as the sponsoring organisation.

Table 1
Samples and response in the DAB panel.

	Wave 1 Jan–Feb 2012	Wave 2 Aug–Oct 2012	Wave 3 May–Jun 2013	Wave 4[a] Oct–Nov 2014	Wave 5 Jun–Aug 2016	Wave 6 May–Jun 2017	Wave 7 May–Jun 2018
Sample size							
Gross sample	4059	4059	4059	4059	4059	4059	4059
Contactable individuals	3894	3707	3436	2652 (1153)	2861	2712	2441
Type of survey							
Online survey	yes	yes	yes	yes	yes	yes	yes
CATI survey	no	no	no	yes	yes	yes	yes
PAPI survey	no	no	no	no	no	yes	yes
Incentive	no	no	no	voucher	voucher	ballpoint pen	money
Realised interviews							
Individuals	3680	3343	3302	2237	2229	2062	1938
of whom: Online	3680	3343	3302	1227 (653)	1334	1374	1627
CATI &PAPI	–	–	–	1010	895	688	311
Response rate in %							
School classes	73%	94%	98%	–	–	–	–
Contactable individuals	95%	90%	96%	84%	78%	76%	79%
Online	95%	90%	96%	52% (57%)	46%	51%	67%
CATI and PAPI	–	–	–	32%	32%	25%	13%

[a] Experimental split – in brackets: only individuals receiving incentive in Wave 4 (for details: Becker and Glauser, 2018).

the control group who did not receive an incentive. The randomisation was carried out at the level of the individuals' previous school class to prevent classmates from feeling either envious or ashamed. (Becker and Glauser, 2018: 8). Provided that the individuals received this incentive, the response rate was 57 per cent and, despite reminders for each of the groups, was significantly higher than was the response rate for interviewees who did not receive a gift (50 per cent).[9]

In the fifth wave, which took place three years after the completion of compulsory education (June 2016), approximately 78 per cent of contactable individuals responded, 46 per cent in the online mode, and 32 per cent in the CATI mode. As mentioned above, the contactable interviewees received a voucher (a hypermarket cash card worth 10 Swiss francs). In Wave 6 (May–June, 2017), approximately 76 per cent of contactable individuals responded, 51 per cent in the online mode, and 25 per cent in the CATI and PAPI modes. All the individuals received an engraved ballpoint pen as a prepaid incentive. Finally, one year later (May–June, 2018), in Wave 7, approximately 67 per cent of the contactable individuals responded in the online mode. All of them received 10 Swiss francs in cash (banknote), enclosed in the advance letter. Considering the low response rate of 13 per cent in the CATI mode and the PAPI mode, the total response rate was 79 per cent.

It should be noted that we limit our analysis to the web mode. In our panel, there is no significant effect of prepaid incentives on the CATI or PAPI mode offered for respondents who were not ready to answer the online questionnaire (Becker and Glauser, 2018).

3.2. Dependent and independent variables

The dependent variable is the likelihood of participation in each of the most recent three waves of the DAB panel study. Hereby, we are mainly interested in the duration (measured on a daily basis) between contact and start of completing the questionnaire.

The three types of treatment – the voucher (hypermarket cash card worth 10 Swiss francs), the ballpoint pen (non-monetary gift worth 2 Swiss francs), and the cash (a 10 Swiss francs' banknote) – are the most important explanatory variables. For reasons of statistical control, we consider the individuals' gender, previous schooling (basic secondary school; advanced secondary school; Gymnasium), grade point average in the ninth grade (6 = highest grade – 1 = lowest grade), and the social class of their parents (EGP

[9] To minimise a selectivity bias that could occur because several respondents has already been affected by an incentive and reacted on it, on the one hand, we consider each of the contactable individuals in the original sample, independent from their previous participation or unit nonresponse. On the other hand, we have to take a carry-over effect – based on the long-term consequences of prepaid monetary incentives for participation in panel surveys – into account. It could be assumed that the (non-) treatment in Wave 4 might have an effect on the individuals' participation in consecutive waves. First, in a previous analysis, we find that the incentive in the fourth wave had no effect either on the individuals' participation in a re-interview 6–8 months later or on the deterioration in the quality of response (Becker and Glauser, 2018; see also: Singer et al., 2000: 186). In line with the study by Singer et al. (1998), payment of an incentive obviously had not created any expectations 'effects as one of the mechanisms behind the carry-over effect. Second, in wave 4, the interviewees were asked if they would be ready for a re-interview, but they could not be certain that they would be interviewed again. The "washout effect" might be true also for the other waves; the time intervals between the waves being increased to 12 months should contribute to the remission of the effect by the quasi-monetary incentive in Wave 4. Third and finally, we have checked for carry-over effects (Table A-1 in *Appendix*). Indeed, in contrast to other studies (e.g., Jäckle and Lynn, 2008; Görritz, 2008), there is no evidence for carry-over effects indicated by main and interaction effects for incentive and panel waves at different points in time. This means that the incentive paid in Wave 4 has no significant effect on participation in consecutive waves.

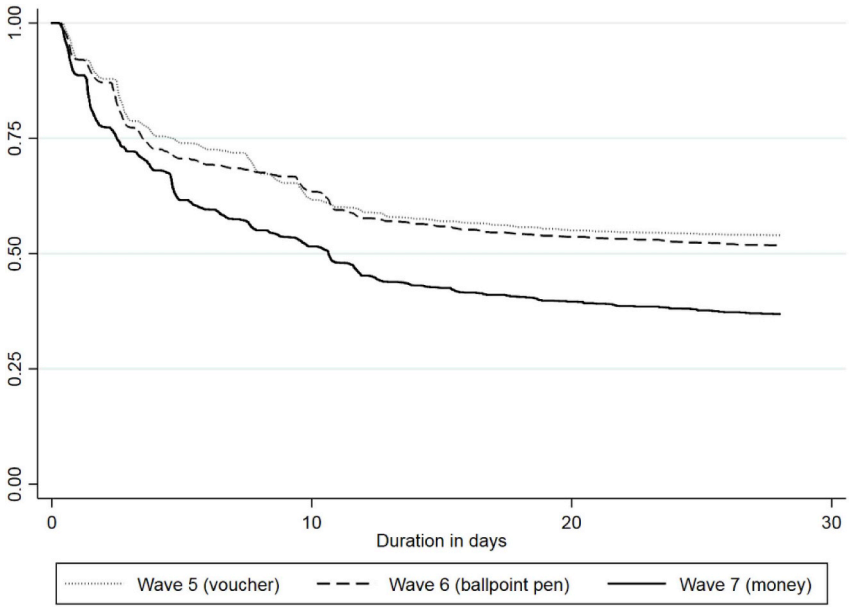

Fig. 1. Impact of incentives on latency until response to online survey (Kaplan–Meier estimates).

class schema by Erikson and Goldthorpe, 1992). It should be noted that missing values for previous schooling and social origin have been considered as a category in multivariate estimations.

3.3. Statistical procedures

For multivariate analyses, we apply dynamic procedures of event history analysis, such as survival analysis and regression models (Blossfeld et al., 2007). The effects of incentives will be described by the Kaplan–Meier estimation and also estimated by a parametric model implying an exponential distribution of the hazard rate; i.e., the marginal value of conditional probability that responses occur as a causal effect of a prepaid incentive. In the case of exponential distribution, the hazard rate is constant across duration time. Considering other distributions of the hazard rate (e.g., either Weibull or Gompertz), the results are quite similar.

To minimise the problem of positive selection of beneficiary respondents across waves, as well as that of comparing something that is incomparable due to assigning different incentives at different points in time, logistic panel regression is used (Long, 1997). Panel regression is useful to detect the fixed effects of incentives on individual responses across waves (Brüderl and Ludwig, 2015). For individuals involved in each wave, this model is employed if dependent and independent variables vary across waves. The mixed effect model is estimated if constant covariates, such as gender or social origin, are included in the estimation.

4. Empirical results

4.1. Impact of incentives on duration until response

As theoretically assumed, and if each of the three waves are taken into account, it is found that prepaid incentives lead to comparatively high response rates in the web-based surveys (Becker and Glauser, 2018). Approximately 53 per cent of the contactable interviewees who received an unconditional prepaid incentive responded, and just 47 per cent did not respond in spite of receiving a prepaid gift. By survival analysis, and in line with our theoretical assumption, different response speeds for the different types of incentives have been revealed (Fig. 1).

The lowest latency is observed for prepaid money (Wave 7). After 10.6 days, half of the interviewees who received the cash incentive had started the questionnaire. However, since the response rate was too low, it is not possible to calculate the median for the latencies of interviewees who received either a voucher in Wave 5 or a ballpoint pen in Wave 6.[10]

[10] In this respect, the finding of the previous experiment with random split (Wave 4) has been replicated again for the individuals who received the voucher in Wave 5 (see Fig. 1 in: Becker and Glauser, 2018: 86). In Wave 5, in respect of the response, there is no significant difference between respondents who have either received or not received vouchers in Wave 4. Whereas 47.5 per cent of the interviewees donated in Wave 4 have participated at Wave 5, approximately 47.3 per cent of the non-treated interviewees have responded in Wave 5. However, these non-treated interviewees provide the highest latency and lowest response rate in Wave 4 compared to the samples in consecutive waves. Once again, there is no carry-over effect and an indication that there is no need for a control group who do not receive any incentive.

Table 2
Effect of incentives on response in online survey – event history models (exponential) and panel regression models: fixed-effect (FE), and mixed-effect (ME).

Model no.	Exponential	Logit (FE)	Exponential	Logit (ME)
	1	2	3	4
Incentives (Wave) (Reference: Voucher (5))				
Ballpoint pen (6)	0.071	0.007	0.079	0.008
	(0.045)	(0.012)	(0.047)	(0.012)
Money (7)	0.550	0.113	0.548	0.113
	(0.045)***	(0.012)***	(0.046)***	(0.012)***
Incentive in Wave 4 (experimental split)				0.016
				(0.017)
Gender (Reference: Male)				
Female			0.360	0.108
			(0.038)***	(0.017)***
Schooling (Ref.: Basic secondary school)				
Advanced secondary school			0.681	0.180
			(0.050)***	(0.021)***
Gymnasium			1.214	0.321
			(0.062)***	(0.024)***
Missing value on schooling			0.378	0.199
			(0.072)***	(0.033)***
Achievement in school				
Grade point average			0.259	
			(0.029)***	
Social origin (Ref.: Unskilled worker (VII))				
Upper service class (I)			0.187	0.040
			(0.097)	(0.039)
Lower service class (II)			0.175	0.063
			(0.093)	(0.037)
Non-manual routine services (III a/b)			0.159	0.050
			(0.091)	(0.036)
Petty bourgeoisie and farmers (IV a/b/c)			0.196	0.057
			(0.112)	(0.045)
Engineer, foreman, skilled worker (V/VI)			−0.012	−0.004
			(0.095)	(0.038)
Missing value on social origin			−0.164	0.003
			(0.099)	(0.045)
Constant	−3.657	0.513	−5.769	0.255
	(0.032)***	(0.007)***	(0.165)***	(0.036)***
N of cases [cluster]	8076	5952 [1984]	8076	5952 [1984]
Response [cluster]	4201	3960 [1320]	4201	3960 [1320]
Wald resp. F resp. LR Chi^2 (d.f.)	180.99 (2)	59.51 (2; 1984)	871.46 (13)	441.13 (13)

$^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; β-coefficient (in brackets: standard error of the estimated coefficients).

The Log-rank and Wilcoxon tests reveal significant differences between the survival curves for non-monetary incentives on the one hand and the survival curve for "cash in the hand" on the other hand.[11] In respect of latency until response, there is a polarised difference between the cash incentive and the other incentives. Overall, cash is the most efficient incentive in terms of relative response rate and latency.

4.2. Impact of incentives on the individuals' inclination to respond

This preliminary conclusion is confirmed by multivariate analysis (Table 2). Estimating dynamic models of event history analysis or panel regression, it is found that cash has a significant positive effect on individuals' response compared to the other incentives, which do not vary systematically from each other. The relative chance, if estimated coefficients are calculated in terms of odds ratios, that individuals will respond in the web-based online survey is approximately twice as high when they are given cash (with no conditions), compared to the other incentives (model 1).

According to the estimated fixed effects (model 2), this is also true for those contactable interviewees who were available for each of the waves. These interviewees have been considered separately, since we have to be aware that the assignment to the experimental conditions was not completely at random but was affected slightly by the self-selection of participants into each of the panel waves (see Table 1 above). The fixed effects' panel regression, which takes into account this methodological limitation of our design, confirms the "naïve" findings of the dynamic estimations. The response rate increases by an average of about 10 percentage points, at

[11] The field time for the web survey was limited to 41 days, as a maximum. The survival analysis revealed that the events became very rare after four weeks. In particular, this is also true for the experimental split in Wave 4 (Becker and Glauser, 2018: 84).

least, provided that the individuals receive cash instead of other incentives. If the previous incentive in the setting of a classical experiment in Wave 4 (Becker and Glauser, 2018) is taken into account (model 4), it is found that there is no positive self-selection due to this first benefit (Singer and Ye, 2013).

In line with theoretical assumptions and previous research, there are differences between the types of incentive. Cash results in a significantly increased response rate, whereas the effects for the other incentives used are much lower and are statistically insignificant. These findings are still valid if some of the contactable individuals' characteristics are considered. Women are more likely to respond to online questionnaires than are their male counterparts (models 3 and 4). Individuals who have been enrolled in cognitively more demanding school tracks participate more often than do individuals enrolled in less demanding school tracks. This is also valid for high achieving persons: the higher their average mark, the greater their inclination to take part in the panel. As found in a previous experiment, these characteristics indicate the interviewees' capacity to cooperate and to respond. Finally, we did not reveal any effects of the juveniles' origin due to their social class and related socio-economic status. Compared to a previous experiment (Becker and Glauser, 2018), this indicates that the effect of social class on response could be eliminated by the incentives.

Overall, there are eight main findings. First, even in a mature panel, there are positive effects of incentives on response rates, varying across the type of gift given. Second, the unconditional prepaid money ("cash in the hand") is the most efficient incentive. Third, the effect of cash minimises the latency for participating in the web surveys across panel waves. Fourth, the positive effect of a prepaid monetary incentive is still significant if one takes the individuals' social characteristics into account. Fifth, it seems that the subjectively evaluated value of an incentive accounts for the anticipated effect on survey participation, since the effect of a 10-Swiss-francs' banknote was significantly stronger than was the effect of a cash card (voucher) with the same objective value. Sixth, despite monetary incentives, there is a social bias in response due to the individuals' education and achievement (i.e., their capacity to respond). Seventh, the models of event history are more likely to fit the data than are the panel regression estimations. Eighth, and finally, due to the positive selection of beneficiary respondents in Wave 4 and the following waves, we are aware that the estimated effects of incentives could be overestimated somewhat.

4.3. Impact of incentives on the social selectivity of respondents

To understand the social structure of cooperative respondents and their sensitivity to a special type of incentive, we estimate the impact of prepaid material incentives on response separately for the different types of incentive. It is found that females are more likely to take part in web-based online surveys than are men, independent of the receipt of any incentive and its subjective value (Table 3). It is obvious, again, that the social selectivity of responses in web surveys is related to the interviewees' educational level and achievement.

Controlled for the type of incentive, it is found that working class children and respondents without report on their social origin (who have, in the main, attended the basic secondary school and might be mainly from a low socio-economic and cultural background) are less likely to respond in each of the three waves. This selectivity is strongest for the panel wave with the voucher as an incentive and is weakest for cash. Overall, this result is surprising, since it has to be assumed that interviewees originating from economically weak families would be sensitive to incentives with higher values, such as the voucher and money with the same material value.

To make this interpretation of the findings on working class children watertight, an additional estimation considers the interaction between social origin from lower social classes and type of prepaid incentive. Controlling for gender, education, achievement, and incentives, it is revealed that lower class children have the lowest response rate (model 4). However, if they receive "cash in the hand", in contrast to other quasi- or non-monetary incentives, their participation in the survey is no different than that of children in the middle and upper social classes (model 5). It is obvious that cash works much better than do other incentives to improve the overall response rate and, in particular, the response rate of individuals with low socio-economic status. In sum, children from lower social classes are the most likely to be sensitive to a prepaid monetary incentive. In this way, only cash is significantly effective in reducing the social selectivity of response indicated by social class and related economic status.

4.4. Impact of incentives on respondents who refuse to participate

Finally, we investigate if there is a lagged impact of cash (Wave 7) on the 'conversion' of those who had refused to participate in one or each of the previous waves 5 and 6 but who subsequently chose to participate in the most recent wave. Since in previous estimations, persons who did not take part in each of the waves were also considered, the estimation in this section is an analysis of the sensitivity of positive selection effects across consecutive waves.

It seems to be that "cash in the hand" is efficient in regard to mobilising individuals who have refused to participate in either one or all of the previous waves, at least for web survey participation. Approximately 44 per cent of individuals who refused to participate in the fifth wave (n = 1188), and a third of those who refused to do so in Wave 6 (n = 1107) took part in the most recent wave. These percentages are higher than in the other shift: approximately 29 per cent of refusers in Wave 5 participated in the next wave.

Multivariate estimations reveal that individuals who refused in Wave 5 were more likely to participate in the last panel wave than were interviewees who refused in the previous wave (Table 4). It is interesting that individuals who refused to participate in Wave 6, despite being given an engraved ballpoint pen, were less likely to be ready to take part in the next wave, despite receiving cash enclosed in the advance letter inviting them to participate in Wave 7. It is speculative to claim that the non-monetary gift was counterproductive in regard to engaging them in relation to the next online web survey, since other confounding factors, such as changes in the executive project management, the survey research institute responsible for the CATI mode, and the different

Table 3
Effect of incentives on selectivity of the response in an online survey.

A2	Voucher (1)	Pen (2)	Cash (3)	Total (4)	Total (5)
Gender (Reference: male)					
Female	0.304	0.408	0.369	0.360	0.359
	(0.066)***	(0.068)***	(0.064)***	(0.038)***	(0.038)***
Schooling (Reference: Basic secondary school)					
Advanced secondary school	0.721	0.710	0.624	0.680	0.681
	(0.088)***	(0.089)***	(0.082)***	(0.050)***	(0.050)***
Gymnasium	1.170	1.328	1.157	1.214	1.214
	(0.108)***	(0.109)***	(0.103)***	(0.062)***	(0.062)***
Missing value	0.236	0.627	0.291	0.377	0.377
	(0.128)	(0.125)***	(0.120)*	(0.072)***	(0.072)***
Achievement in school					
Grade point average	0.263	0.262	0.258	0.259	0.260
	(0.051)***	(0.050)***	(0.048)***	(0.029)***	(0.029)***
Incentive (Reference: ballpoint pen)					
Voucher				−0.079	−0.067
				(0.047)†	(0.058)
Cash				0.469	0.440
				(0.046)***	(0.058)***
Social origin (Reference: Salariat/Middle class)					
Working class (V/VI/VII)	−0.245	−0.173	−0.141	−0.183	−0.177
	(0.086)**	(0.086)*	(0.079)†	(0.048)***	(0.085)*
Missing value	−0.324	−0.470	−0.226	−0.338	−0.400
	(0.103)**	(0.106)***	(0.102)*	(0.060)***	(0.099)***
Interaction: incentive and social origin					
Voucher and Working class					−0.069
					(0.120)
Voucher and Missing value on social origin					0.013
					(0.133)
Cash and Working class					0.042
					(0.115)
Cash and Missing value on social origin					0.162
					(0.136)
Constant	−5.560	−5.620	−5.020	−5.518	−5.513
	(0.259)***	(0.257)***	(0.245)***	(0.149)***	(0.151)***
N of cases [cluster]	2870	2712	2493	8075	8075
N of response (in %)	1321 (46%)	1306 (48%)	1574 (63%)	4201 (52%)	4201 (52%)
Wald resp. F resp. LR Chi^2 (d.f.)	225.43 (7)	275.36 (7)	232.71 (7)	872.11 (10)	879.30 (13)

$^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; $^{\dagger}p < 0.1$; β-coefficient (exponential model; in brackets: standard error of the estimated coefficients).

reminders, could not be controlled for. As for previous multivariate analysis, it should be noted that we have not taken additional requests for survey participation (reminders), such as SMS, web SMS, and e-mails into account. In a previous survey experiment in Wave 4, we confirmed empirically that incentives are pivotal, while reminders are sufficient (Becker and Glauser, 2018: 11). In the context of TDM, unconditionally prepaid cash is just one of the strategic elements necessary for improving response and retention rates (Dillman et al., 2014). In sum, among different types of unconditional prepaid material incentive, cash is the most significant both in cross-sectional studies and in panel surveys. Indeed, the use of prepaid cash is most effective in improving response rates in a mature panel study.

5. Summary and conclusion

Starting from general research into survey methodology as regards response rates in social–scientific surveys, and improving them by means of unconditional prepaid material incentives, it is the aim of our contribution to evaluate short-term and long-term effects of such incentives on the response rates in three consecutive waves in our mature DAB panel study (Becker and Glauser, 2018). Apart from randomisation bias, the main problem in previous experimental studies on the effects of prepaid monetary incentives has been the fundamental problem of causal inference occurring in traditional experiments with random assignment of different treatment conditions (Holland, 1986). This problem implies that we cannot, at a given point in time, observe the individual causal effect of D on the outcome Y for a single unit of observation but can observe only the effect of either D or *not D* for any subject. In particular, this is true for experiments that split individuals randomly into experimental and control groups at a single point in time (Blossfeld and Rohwer, 1997). Therefore, we use an alternative procedure. Each of the interviewees was assigned to different treatments in each of the different panel waves. In practice, in the first point in time (Wave 5 of our panel), we assigned each individual a cash card of a Swiss hypermarket as a semi-monetary incentive. In the next wave, Wave 6, individuals received a non-monetary gift (an engraved ballpoint pen), and, in the most recent wave, we sent them a 10 Swiss francs' banknote enclosed in the advance letter. Taking into

Table 4
Effect of incentives on participation in Wave 7 – refusals in previous waves only.

Model no.	1	2
Type of incentive (Reference: Wave 5)		
Wave 6	−0.186	−0.172
	(0.051)***	(0.050)***
Gender (Reference: Male)		
Female		0.150
		(0.050)**
Schooling (Reference: Basic secondary school)		
Advanced secondary school		0.357
		(0.066)***
Gymnasium		0.657
		(0.077)***
Missing value		0.202
		(0.096)*
Achievement in school		
Grade point average		0.143
		(0.037)***
Social origin (Reference: Unskilled worker (VII))		
Upper service class (I)		−0.089
		(0.088)
Lower service class (II)		0.046
		(0.080)
Non-manual routine services (III a/b)		−0.018
		(0.077)
Petty bourgeoisie and farmers (IV a/b/c)		0.009
		(0.115)
Engineer, foreman, and skilled worker (V/VI)		0.035
		(0.117)
Missing value		−0.181
		(0.095)
Constant	−4.155	−5.180
	(0.033)***	(0.192)***
N of episodes	2375	2375
N of response	954 (40.2%)	954 (40.2%)
Wald resp. LR Chi^2 (d.f.)	13.43 (1)	142.80 (12)

†$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; β-coefficients (in brackets: standard error of the estimated coefficients); exponential model.

account that it has been empirically confirmed that prepaid incentives always have a positive effect, by comparison to non-treatment, this means that we are using an alternative but efficient way of observing the counterfactual of what would have happened to the units in a treatment group if they had not been exposed to that treatment (Angrist and Pischke, 2009; Morgan and Winship, 2007). There was no need to consider a control group receiving no treatment, since it is taken for granted that each prepaid material incentive will work either worse than or better than the others (Ernst Stähli and Joye, 2016). In this way, we might overcome the methodological challenges posed by problems of causal inference. Since previous prepaid incentives (in Wave 4, for example) have no significant effect on responses across consecutive waves (for details see: Becker and Glauser, 2015) it could be assumed that the stable unit treatment value assumptions (SUTVA) behind the problem of causal inference have been satisfied (Angrist and Pischke, 2009; Morgan and Winship, 2007). The first main requirement for valid causal inference is that there is no interference between treated and untreated subjects such that the assigned treatment to beneficiary interviewees has no influence on the potential outcomes of non-beneficiary units. The second main requirement is that there are no different "forms or versions of each treatment level, which lead to different potential outcomes" (Imbens and Rubin, 2015: 10).

The subjects were young students in German-speaking regions of Switzerland who were asked at each of the panel waves to take part in our web-based online survey regarding their educational aspirations and trajectories (Glauser and Becker, 2016; Glauser, 2015). We executed this experiment after the students had finished their compulsory schooling and after a survey experiment was carried out as a pre-test (Becker and Glauser, 2018). According to different approaches, such as the economic and social exchange theories and the theory of subjectively expected utility (enriched by the theory of frame selection), it was assumed that panellists who received unconditional prepaid donations of subjectively high value (cash) would be more likely to cooperate with the researchers than would the same panellists who received a gift of lower value (ballpoint pen) at another point in time. Furthermore, we expected

that panellists who received cash would start to fill out the online questionnaire earlier than would panellists who received non-monetary incentives with either the same or a different objective value. Based on social mechanisms, such as cost–benefit calculations and the norm of (altruistic) reciprocity, in addition to the idiosyncratic characters of monetary and non-monetary incentives, it was additionally assumed that – due to the characteristic of money as a universal medium – interviewees would be more likely to cooperate when they received cash, rather than either a voucher (of the same objective value) or an engraved ballpoint pen (of a rather lower value). Additionally, we expected that panellists who had refused to take part in the interview in previous waves would be more likely to cooperate in the most recent panel wave after receiving "cash in the hand". Finally, our experimental design was limited to the first mode we offered to the juvenile interviewees – namely, the web-based online surveys – since we learned that the effect of prepaid incentives faded away rather rapidly after assigning them to the interviewees, and this effect could not be transferred to another survey mode at a later point in time of the field work, such as CATI or PAPI. Overall, we observe no direct long-lasting effects of prepaid incentives across modes and waves (Becker and Glauser, 2018). There is no carry-over effect whereby the treatment (voucher) in a previous experiment in the classical design distinguishing random and control groups has affected the outcome in the following panel waves.

The empirical findings for the online mode are significant. In line with the previous survey research, the consistent positive result is found that money counts all along! Prepaid incentives worked as theoretically assumed, whereas cash (monetary incentive) was the most efficient incentive in regard to the likelihood and speed of response. Therefore, for panel studies, it is recommended not to use incentives such as cash cards (a quasi-monetary incentive) and non-monetary incentives (ballpoint pens). Furthermore, we have revealed that, after assigning the prepaid money, there is no significant social selectivity in regard to respondents' social origin, although the differences in the responses across individual characteristics, such as gender, schooling, and achievement, remain in each of the panel waves. In particular, target persons from families in lower social classes suffering from low socio-economic and cultural resources have been mobilised by cash. In future research, we will have to analyse if these socially selective responses also depend on the juveniles' experiences in their educational trajectories and other areas in their life course, such as critical events, failures, and records. Finally, we have indirect indications that – compared to other incentives – monetary incentives are more likely to be efficient as regards 'converting' interviewees who initially refuse to cooperate. However, this last finding is rather preliminary, since we need to observe the findings in future waves. On the one hand, the effect is rather weak. On the other hand, confounding factors, such as changes in the executive project management, the survey research institute responsible for the CATI mode, and the different reminders, could not be controlled for.

Of course, our study has serious limitations. First, despite the findings of our experiment being in line with previous findings and with the social mechanisms (such as reciprocity, cognitive dissonance, subjective evaluation of additional benefits, and trust in social interaction) claimed by the theoretical approaches, it should be noted that we were not able to verify these mechanisms for the correlation of D (cause) and Y (outcome) empirically. Second, the assignment to experimental conditions across successive panel waves was somewhat undermined by a rather low degree of non-random self-selection of participants in the course of panel attrition; i.e., by positive selection into waves affecting the retention rate.

Therefore, for future research into survey methodology, we identify three challenges. First, due to the lack of direct measurement the question of whether reciprocity, trust, and individuals' evaluation of money as a universal medium of exchange (in contrast to other material incentives) are actually the main mechanisms important for interviewees' cooperation and response remains unresolved. Therefore, there is an urgent need to test the sophisticated rational choice theories explaining individuals' cooperation and the effects of unconditionally prepaid incentives in social-scientific surveys, and, in particular, the claimed social mechanisms, both directly and exhaustively. Second, in terms of cumulative research, there is an additional need to improve and replicate the type of experiment we report on here. Third, since it is evident that prepaid incentives positively affect retention rates in later waves of a panel study and that increased incentives in later waves have a positive effect on the response (Pforr et al., 2015), it is interesting in our case to analyse if the prepaid monetary incentive offered in the latest wave will have long-term effects on the stability of retention rates in future waves.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssresearch.2019.02.008.

Appendix

Table A-1
Carry-over effects of incentives in Wave 4 on consecutive waves-response to online survey only

Waves	*5*	*6*	*7*	Total	Total
Prepaid incentive					
Incentive in Wave 4	0.007	0.114	0.091	0.069	0.007
	(0.085)	(0.087)	(0.093)	(0.051)	(0.085)
Participation					
Participation in Wave 5				*Reference*	*Reference*
Participation in Wave 6				0.132	0.078
				(0.061)*	(0.086)
Participation in Wave 7				0.614	0.572
				(0.063)***	(0.089)***
Interaction: Incentive & participation					
Participation in Wave 5					*Reference*
Participation in Wave 6					0.018
					(0.020)
Participation in Wave 7					0.012
					(0.018)
Constant	−0.108	−0.030	0.464	−0.139	−0.108
	(0.060)	(0.061)	(0.065)***	(0.050)**	(0.060)
N of cases	2229	2058	2005	6292	6292
Pseudo-R^2	0.0000	0.0006	0.0004	0.0122	0.0123

$^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; logit-coefficients (in brackets: standard error of the estimated coefficients).

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