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Looking for a Middle Class Bias:
Salary and Co-Operation in Social Surveys

Non-technical summary

Survey researchers generally believe that people with an average social standing, the middle class, are more likely to take part in social surveys than the poorest and richest groups in a society ("middle class bias"). This has never been conclusively proven, because it is rarely known what the social standing of people who refuse is. Our aim in this paper is to test the relationship between social standing and the probability to co-operate with a social survey request and to find out whether there is a middle class bias in survey response.

There are several reasons why people refuse to take part in surveys, some of which are more amenable to persuasion than others (for example not considering social surveys worthwhile vs. not having time when an interviewer calls). These reasons are related to social standing in different ways, which allows us to pose a series of hypotheses.

We carry out our analysis using Estonian EU-SILC 2007 survey. For all sample members information about survey outcome and how this was achieved has been linked to an administrative tax register. We use annual salary for a previous calendar year from the register as a measure of social standing.

The results of our analysis do not lend support to the common assumption of middle class bias. Instead we find that people with the highest social standing are the least likely to respond. Yet if we take into account that these people also live in the capital area and in cities, then the effect of salary becomes insignificant. It does however play a considerable role when we take a closer look at the way people responded to interviewers. We find that the higher one's salary, the more likely it is that an interviewer had to call back at the address several times. However, as these people are not more likely to refuse after more than one call, we argue that this implies that many of these people are hard to get hold of but not necessarily reluctant. By contrast, high salary earners are also distinguished by being much more likely than anybody else to give a firm refusal the first time interviewer calls. This seems to be related to firmly held convictions, such as not believing in the need for information about a society that could lead to improvements in social policy. We conclude that people have different reasons for refusing to take part in a survey and that these reasons

are to a certain extent predictable. This suggests that varying ways and messages that survey organisations use when contacting different people could have a positive effect on survey response.

Looking for a Middle Class Bias: Salary and Co-Operation in Social Surveys

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Abstract

The aim of this paper is to test the existence of middle class bias in survey co-operation. We do this by carrying out a record check study. Our analysis uncovers no evidence of middle class bias. Instead we find a negative gross bias in estimates of the proportion of persons with highest salaries. We also find that high salary earners are more likely to be hard refusers. We argue that this 'elite resistance' is due to specific attitudes rather than more transient features of an interaction. We suggest that these attitudes could be overcome by tailoring of advance communication.

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Key words

Non-response bias, survey co-operation, EU-SILC, salary

Introduction

Social class and socio-economic status are very much relevant in contemporary societies. In addition to being of interest in their own right to social stratification researchers, social standing is also strongly related to a multitude of attitudes and behaviours. This means that non-response bias related to social standing can have an effect on any one of these measures. Additionally, closely associated concept of income has a high practical and political relevance, as it is used to calculated poverty and inequality indicators. It is thus vitally important to have a clear understanding of the nature of and reasons for non-response bias in estimates of socio-economic status and income.

Pretty much everybody in the survey research community knows how social standing and probability of responding in a social survey are related to each other (Groves & Couper, 1998: 127). It is those in the middle of the social spectrum who are thought to be the most compliant when approached with a survey request. Yet this wisdom seems for the most part to be based on the anecdotal evidence and not on rigorous scientific inquiry. In fact this 'middle class bias' appears to be rather elusive in non-response research.

The main aim of this paper is to bring some clarity to this situation by investigating the association between socio-economic status (taking salary as a proxy) and response behaviour in a general population survey. To do this we will analyse data from Estonian EU-SILC survey that has been fully linked to administrative records.

1. Literature review

The relationship between socio-economic status and survey response is generally thought to be curvilinear with lower and higher status individuals being less likely to respond (Groves & Couper, 1998: 127). This middle class bias has been a common assumption in the survey research literature for many decades. This is despite the fact that there is no robust empirical evidence to support this supposition. In fact there is no conclusive evidence to support any one shape of relationship between socio-economic status and response behaviour. Additionally, evidence that there is comes

mainly from literature that is primarily concerned with non-response bias in some other substantive variable and the results for socio-economic status or income are often not elaborated on.

Data on social standing of non-respondents is notoriously rare. Where available, it tends to be restricted to a fairly limited sub-population, such as employees of a particular city (Weaver, Holmes & Glenn, 1975), inhabitants of a few towns (Goyder, 1987) or the unemployed (Pedersen, 2002). Studies that do use general population samples usually lack this kind of validation data and have instead had to extrapolate from respondents to non-respondents. This involves comparing the characteristics of reluctant respondents with those whose co-operation was easier to secure or harder to contact respondents with those who were reached on the first call. For example research by Curtin, Presser and Singer (2000) and O'Neil (1979) falls into this category. A problem with this line of research is, as Lin and Schaeffer (1995: 252) have shown is that the assumption of similarity between non-respondents and reluctant respondents does not necessarily hold in practise.

A few studies that have demonstrated the existence of middle class bias (e.g. Becketti et al, 1988: 483; Hill, 2001: 430) have all analysed attrition in panel surveys and not non-response in cross-sectional settings, which is likely to involve somewhat different mechanisms. Interestingly, the only curvilinearity that has been demonstrated in cross-sectional surveys has been of reverse shape, i.e. with higher response probability on the tails of income distribution (DeMaio, 1980: 228; Weaver, Holmes & Glenn, 1975: 261). However, the first of these studies relied on interviewer observations with considerable proportion of missing data and the second was based on a specific sub-population.

In fact the most common finding so far has been a linear positive association between income and response probability, with those with lower income (or social standing) being more likely to refuse (e.g. O'Neil 1979: 222; Smith, 1983: 395; Goyder, 1987: 98; Fitzgerald, Gottschalk & Moffitt, 1998: 297). Yet none of these studies have involved cross-sectional record-checks for general population.

A negative association has been reported as well, although again this has mainly been based on specific populations such as the unemployed (Pedersen, 2002) or comparing different levels of fieldwork effort (e.g. Keeter et al., 2000).

The only study involving general population and using external information on non-respondents is the Census link study by Groves and Couper (1998). They report no association between co-operation probability and housing cost after controlling for various individual, household and environmental characteristics (Ibid., 150).

2. Specifying the research question

2.1 Contact and co-operation

Survey non-response is a result of two different processes – contacting sample members and once contacted ensuring their co-operation with a survey request. In face-to-face surveys, the success of the former is mostly related to at-home patterns and access impediments, while the latter is a result of social interaction that has a specific set of features (Groves & Couper, 1998: 151). There is no particular reason therefore to assume that these are caused by the same factors and it has been shown to be the case (Lynn et al., 2002: 146). While it is not always explicit in the literature, the middle class bias in survey response is related to co-operation and not to contact probability. For this reason the association between non-contact and socio-economic status will not be considered in this paper, instead we will concentrate exclusively on the co-operation probability conditional on contact. Also excluded is the small residual category of sample members who could not respond because of health problems or language difficulties.

2.2 Socio-economic status

Socio-economic status reflects person's position in the social hierarchy and is a combination of income, education and occupation (Ganzeboom & Treiman, 1996: 204). In principle, hypothesis of middle class bias is formulated not in terms of socio-economic status but of social class. However, in much contemporary social research class is usually understood as a grouping of social positions with similar socio-

economic status. The latter is in turn based on the current or past occupation depending on the combination of level of education required for and prestige and income associated with it (Sørensen, 1994: 232).

This paper will use annual salary as a proxy for socio-economic status and social class. As is clear from the above, it does not capture all of the aspects of socio-economic status and class. However, as it is strongly correlated with person's education and occupation and can be expected to be related to substantive behaviours and attitudes in much the same way, then it is not an unreasonable substitution. In fact very few of the previous studies on this topic in non-response literature have used measures of socio-economic status or social class. Researchers have instead drawn on the data about income or some other monetary indicator, such as housing cost (Groves & Couper, 1998) or property value (Goyder, Lock & McNair,1992). Also salary is arguably more relevant from the practical perspective, as it is of substantive interest to many surveys on income while socio-economic status and social class are commonly only used as socio-economic break variables.

In contemporary societies, labour market involvement is one of the key determinants of socio-economic well-being, with those not earning their living being often in a more precarious position. We have therefore decided not to restrict this analysis to salary earners, but to put their results into a wider societal context by including persons who did not earn a salary. It will not always be possible to form meaningful hypothesis for the group of not employed persons due to its diversity (including the unemployed, students, retired etc), but where it is feasible, it has been done.

2.3 Non-response in cross-sectional and panel surveys

Much of the literature on non-response is based on research into panel attrition. The advantageous feature of panel surveys from the second wave onwards is the wealth of information that is already known about non-respondents. Yet the findings from this strand of research do not necessarily apply to non-response in cross-sectional studies and first waves of panel surveys (e.g. Pyy-Martikainen & Rendtel, 2008: 315). Panel members have all already co-operated with a very similar survey request, which

means that they are more similar to each other in terms of response probability. It also means that the consequences of consenting with interviewer's request are much less uncertain. Sample members will now have the experience of the previous wave interview to draw on, which should make the influences of non-response much more situational and as such less predictable. This paper will test out this hypothesis by comparing the association between salary and co-operation propensity in the first wave of a panel survey to that in the subsequent waves.

2.4 Mode of data collection

This paper will concentrate on co-operation in face-to-face surveys as the most common mode for major social surveys. However, the results should for the most part be applicable to telephone studies as well. It is less true for other modes of data collection such as mail and web surveys, where there is no direct interaction between an interviewer and a sampled person.

3. Theory of non-response behaviour

3.1 Co-operation mechanisms

Theorising around the reasons of non co-operation has not been very systematic. By far the most common approach has been the social exchange theory, which has been successful in explaining some aspects of non-response (viz. the use of incentives), but less of others. Other concepts that have been applied, have been derived from different levels of generalisation in social theory (e.g. it is argued in this paper that the fear of crime is better understood as a specific manifestation of lack of social trust) thus further adding to the confusion.

This paper will take the approach propagated by Groves and Peytcheva (2008: 169) by analysing the "conceptual linkage between individual survey measures and participatory influences". It is not assumed that salary has a direct causal influence on co-operation probability. Instead we will adopt a modification of what Groves and Peytcheva (2008: 168) call the 'common cause model'. According to this model bias arises because a factor that causes non-response also influences the substantive variable measured in a survey. We will relax the second part of this specification by

not restricting the direction of causality between a substantive variable and factor directly causing non-response (i.e. a substantive variable is allowed to have a causal influence on the factor that causes non-response). We will sketch the likely general causes of survey co-operation and will then investigate the substantive sociological and psychological literature on the association between these factors and socio-economic status and income[1]. These findings will then be used to formulate the hypothesis about the nature of non-response bias relating to salary of which 'middle class bias' is only one of the possibilities.

While many features of a survey request can vary depending on the nature of a survey and decisions made by the surveying organisation, there are also some general features inherent to the interaction between survey organisation and sampled person that are more general and apply to the vast majority of surveys. As such, a face-to-face request to participate in a social survey can be conceptualised as an unsolicited request from a stranger to be let into one's home for a considerable amount of time to ask personal questions in the name of a greater social good.

All of these features can activate different and potentially conflicting attitudes, values and norms. We will next discuss what these factors are and how these are related to income. In doing so, we have found it useful to distinguish between factors that are common to all face-to-face social surveys and factors that vary from survey to survey. This allows clearer distinction between results that are specific to the particular survey used in this paper and those that are likely to have wider applicability.

3.2 General factors

Pro-social behaviour. An interview request can be viewed as an interaction where a stranger (interviewer) asks a sample member to help them by consenting to an interview (Groves, 1989: 222). As such agreeing to be interviewed is an act of pro-social behaviour, defined as 'voluntary actions that are that are intended to help or benefit another individual or group of individuals' (Eisenberg & Mussen, 1989: 3).

[1] It should be noted that all of the relationships between socio-economic status and factors related to co-operation discussed below have been tested using data from other surveys, which could have been subject to their own non-response bias.

The motivation for this kind of behaviour could either be selfless interest of helping others (altruism) or internalised norm of reciprocation. Pro-social behaviours vary in their degree of formality, premeditation and relationship with the person being helped. Request to grant an interview can in this framework be seen as an informal, unplanned helping of a stranger (Groves, 1989: 223).

There is a wealth of psychological literature on pro-social behaviour. The majority of this is however based on experimental research on non-representative samples, which means that relationship with usual socio-demographic characteristics has not been investigated in great detail. One of the few exceptions is the work of Einolf (2008), who modelled the relationship between various forms of pro-social behaviour and socio-demographic characteristics on a general population sample. He found that income was not at all or very weakly associated with various types of informal spontaneous helping behaviours.

Hypothesis 1. This leads us to hypothesise no relationship between salary and survey co-operation to be mediated through pro-social behaviour.

Civic responsibility. Notions of civic responsibility or civic duty are often evoked when discussing co-operation in social surveys (Groves & Couper, 1998: 131). Civic responsibility is manifested in civic engagement, which involves actions such as voting, formal volunteering, contributing to charitable causes, campaigning and so on. Participating in a social survey shares many features with these activities, such as explicit or implicit association with the state and giving up something (i.e. time and information) for improved communal welfare, and could thus evoke similar sense of civic responsibility.

Unlike pro-social behaviour, civic engagement is something that is strongly tied to one's socio-economic position. There is ample evidence that people with higher social standing and income are more likely to vote (Verba, Scholzman & Brady, 1995: 189), participate in voluntary organisations (Perkins, Brown & Taylor, 1996: 85) and so on. This could be explained by persons with a lower socio-economic status being more

likely to be disillusioned with the state and less likely to share the norms of civic responsibility.

Hypothesis 2. It is thus plausible to hypothesise that agreeing to take part in a social survey is positively associated with one's salary via civic responsibility.

Social trust. Social trust has many forms – particularized trust in close others, instrumental trust and generalised trust (Delhey & Newton, 2005: 311). Of these it is the notion of generalized trust, that is trust in others that we do not know well, that is particularly important for understanding survey co-operation. Sample members do not personally know an interviewer who calls at their address and have only an advance letter and interviewer ID to convince them that the interview request is in fact genuine. People also have very little time to base this decision on, so they may instead rely on heuristic of trust in others, i.e. a belief "that others will not deliberately or knowingly do us harm, if they can avoid it, and will look after our interests, if this is possible" (Ibid.).

With regard to socio-economic status, it has been shown that people who are higher in the social hierarchy are more likely to say that people can generally be trusted (Alesina & La Ferrara, 2002: 207). This is in line with the fact that social and community disorganisation is generally associated with low levels of social trust. A specific manifestation of lack of social trust is the fear of crime (Walklate, 1998: 414). It is probable that people who do not feel safe in their local area are also less likely to invite strangers into their homes and to grant them interviews. Again fear of crime has been shown to be negatively associated with socio-economic status (Will, 1995: 174).

Even if people believe that an interview request is genuine, they may be less convinced that the data they share with an interviewer will be kept confidential. There is some evidence that people with lower socio-economic status are more likely to be concerned about information security (Raab & Bennett, 1998: 268).

Hypothesis 3. Social trust hypothesis would thus lead us to predict that the probability of co-operating with a social survey request increases with salary.

Attitudes towards welfare state. Very broadly, the aim of any social surveys is to collect information about a society which should then be used to improve the social situation in a country. This is usually assumed to happen through government policy, as most social surveys are either conducted or commissioned by the government. This is seen as a good selling point by survey organisations and few social surveys fail to emphasise this when approaching potential respondents.

Some people could, however, consider such goals less relevant than others. Different groups in society have different views about the extent to which government should get involved in helping weaker members of a society and redistributing resources. Those who do not think this role should be extensive, may also be less likely to appreciate the social survey enterprise.

Consideration of literature on attitudes towards welfare state may be helpful here. It has been found that those who are generally better off are less likely to support further redistribution of resources to reduce inequalities in a society (e.g. Linos & West, 2003: 399). This seems to be due to a mixture of reasons. First, there is the obvious notion of self-interest – those who do not benefit from government transfers and are less likely to need these in the future, see little to be gained and potentially something to be lost as a result of more extensive social policy measures (Kangas, 1997: 475). Another set of reason that is commonly referred are political values and preferences. People may support welfare state because they believe in its underlying principles of social justice and solidarity (Ibid.). And thirdly, the public knowledge of extent of social problems can be limited (Orton & Rowlingson, 2007: 17) which may lead to underestimation for the need of public provision.

Support to redistribution and welfare state is strongly tied to one's income - the higher the income, the lower the support. It is worth noting that this relationship is not monotonic. The decrease in support is usually the greatest among those with highest

incomes. For example according to the European Social Survey the proportion of people living in Estonia (the country where our survey was conducted) who agreed or strongly agreed with the idea that government should reduce differences in income levels was 47% in the fifth income quintile compared to 66% in the fourth.

Hypothesis 4. If those who support less extensive government involvement in their lives are also less likely to participate in social surveys carried out on its behalf, then we can expect the probability of co-operating with a survey request to decrease as salary increases and possibly markedly so among the top earners. It is also expected that those who do not earn a salary and are therefore likely to be more dependent on the welfare state are more likely to participate in a social survey.

3.3 Survey-specific factors

While the effect of the factors discussed above on the co-operation probability of particular person should be the same regardless of the survey, there is a separate group of factors that can exert a different effect on response probability depending on the particular survey.

Norm of reciprocity. The norm of reciprocity means that 'we owe others certain things because of what they have previously done to us' (Gouldner, 1960: 171). Norm of reciprocity is central to the social exchange theory that sees social behaviour as motivated by consideration of balance between the cost it is likely to incur for us and the benefit we are likely derive from it (Homans, 1958: 606). Neither costs nor benefits are necessarily material and can be delayed in time. This is possible because the norm of reciprocity according to which engaging in behaviour that gives other people benefits creates an obligation to return the favour at some point in the future (Gouldner, 160: 174). As such, social exchange theory applies to both, relationships between individuals and relationships between an individual and a social institution (Ekeh: 1974: 50).

The sense of obligation that is crucial for the norm of reciprocity to function can either exist naturally in the sample or be created by a survey organisation. The most

obvious example of the latter is the use of incentives. When promised in an advance letter on the condition of response and especially when sent with an advance letter unconditional on the response, the incentives work to create an informal obligation to the sample member to return the favour (Groves & Couper, 1998: 282). When an interviewer calls at an address and mentions the incentive, a sample member is reminded of this favour that should now be returned to an interviewer by completing the interview.

As incentives often have a clear monetary value, the extent to which the norm of reciprocity is evoked is likely to be directly related to individual's economic situation. This is evident from the extensive research into the effect of incentives, which has shown that these are more successful in bringing in people from the lower end of income distribution (Ryu, Couper & Maranas, 2005: 103).

However, the sense of obligation felt by sample members can also vary depending on previous exchanges with the organisation approaching them with a survey request (Groves & Couper, 1998; 126). This includes a survey organisation, but more importantly a sponsor of a study, who in the case of most social surveys is usually better known to the general population. Where there have been no previous exchanges or the exchanges have been disproportionally favouring a sponsor, a person is likely to feel less obliged to participate. However, if a person has previously benefited from exchanges with a sponsor, then they are more likely to reciprocate by taking part in a survey. In relationship with specific government institutions, those with a lower social standing are more likely to benefit from various social policy measures and thus feel indebted, while those better off have contributed more themselves, for example in the form of taxes, and are thus less likely to assume they owe yet another favour (Ibid.; 127).

Hypothesis 5. No incentives were used to collect the data that is used in this paper, so there cannot be any effect arising from the sense of obligation towards the survey organisation or an interviewer. The same applies to the sponsorship. The study was

introduced as organised by a national statistical institute with which very few sample members are likely to have had previous associations.

Self-interest. Acting out of sense of obligation is only one side of the equation in the social exchange theory. It also predicts that people will engage in activities that benefit them directly (Homans, 1958: 606). The direct benefits that can be derived from participating in a social survey are the incentives if survey organiser has decided to use these and also specific improvements that the sponsor promises to implement as a result of having analysed data. In social surveys these are usually changes in specific social policy areas (for example policies to improve financial wellbeing of mothers' of young children) or services. In so far as those on lower incomes are more likely to benefit from such measures, they can also be assumed to have greater interest in participating in a particular social survey. The association of income and incentives has already been discussed.

Hypothesis 6. As no incentives were used and no promises were made in the advance letter with regard to specific policy areas, then no survey specific effect resulting self-interest is expected to arise.

Topic interest. A social survey interview has often been described as a conversation (Schaeffer, 1990). As people derive more enjoyment from talking about things that are important to them, it is likely that the topic of survey can *inter alia* make some groups in a society more likely to take part (Groves & Couper, 1998: 145). It has, for example, been shown that people with greater interest in politics are more likely to grant an interview in an elections study (Couper, 1997: 322).

Hypothesis 7. The survey that is used as an example in this paper touched on various general topics such as employment, education and income, none of which was very prominently communicated in the advance letter. No specific effect from the study topic is thus expected to arise.

3.4 Mediating factors

Time availability. Most face-to-face social surveys entail at least a thirty minute interview, but are often substantially longer and sometimes seek to collect information from more than one household member. Sample members will therefore either have to have discretionary time at the moment an interviewer calls or have time in not very distant future in order to be able to schedule an appointment. Unlike factors discussed above, time availability is an objective measure of resources available to a sample member to participate in a survey. We believe it is best understood as a mediating factor. The less discretionary time an individual has, the higher they have to score on any of the attitudes and values discussed above for them to co-operate with a survey request.

What is most relevant from survey co-operation point of view is free time spent at home. Burchardt's (2008: 21) notions of free time as time not committed to personal care, paid and unpaid work is probably the most useful here, as this is time that a person will potentially have available for participating in a social survey. Her results show that there is a weak albeit significant relationship between free time and income, with those who earn more having less non-committed time (Ibid., 34).

Hypothesis 8. Again, this leads us to hypothesise a negative relationship between salary and co-operation propensity. Also those with no labour market involvement are likely to have more time at their disposal and should therefore be more likely to grant an interview in a social survey.

3.5 Interviewer effects

Co-operation probability with a social survey request depends of course not only on the characteristics of a sample member but also those of an interviewer. Interviewer experience, training and disposition have all been shown to make a difference (Groves & Couper, 1998: 215). However more detailed discussion of these effects is outside of the scope of this paper.

3.6 Combined effect of factors

The hypotheses above have all been formulated in terms of pure effect of each factor. While some of these effects are of opposite direction, they should nevertheless not be regarded as exclusive. Instead it is probable that all of these factors interact to produce aggregate level non-response patterns.

It is helpful here to refer to the leverage-salience theory (Groves, Singer & Coring, 2006), which offers a framework for understanding effects of multiple factors on non-response behaviour. Groves and colleagues suggest that various survey design attributes have different levels of leverage for each particular person. The decision to respond or to refuse is a result of a balancing act between these sometimes contradictory attributes. While the original formulation of the leverage salience theory concentrates on the survey specific attributes, we believe that it can equally well be applied to attributes that are common to all social surveys, such as need to allow a stranger (an interviewer) to enter one's home.

Middle class bias assumes a leverage that is associated with a particular survey design attribute to vary by social standing in a specific fashion. Thus, for the middle class bias to hold, persons with lower socio-economic status should, because of their lower levels of generalised trust and civic responsibility, attribute greater leverage to the encounter being with a stranger asking them to do something for the benefit of the society as whole. At the same time persons with higher socio-economic status should, because they have less time and see less need for further social policy measures, attribute greater leverage to the length of the questionnaire and social policy aims of surveys.

4. Data sources

4.1 Survey data

This paper uses data from Estonian 2007 EU-SILC (European Community Statistics on Income and Living Conditions) survey. EU-SILC is an official survey of the European Union with the main aim of producing harmonised social inclusion

indicators (at-risk-of-poverty rates, measures of income inequality etc). Estonian EU-SILC was conducted and all subsequent data linking was done by Statistics Estonia.

Estonian EU-SILC is a panel survey with a rotational design. Each year a new independent cross-sectionally representative sub-sample is included in the study for four years and a sub-sample that has already been in the study for four years is dropped. As a result, each year the sample consists of persons who have been in the study for the past one, two or three years as well as a fresh sub-sample that has not been contacted before. In the analysis that follows, separate models were run for the first year and panel samples. While it would have been interesting to explore the differences between panel sub-samples, the number of refusers in each sub-sample was too small to allow this analysis. Controls for year were included in the pooled models to account for variation in sample size between the years.

In each panel sub-sample, only cases that co-operated in the previous year were issued for the fieldwork. Households that could not be contacted or refused to take part in any of the previous waves were thus not included in this analysis. As a result, the sample becomes more selective with each subsequent wave.

The sample for the study was drawn from the Population Register and was stratified by place of residence (three groups of counties) but unclustered. The sampling fractions differed considerably reflecting the size of the counties as well as different average expected response rates. As a result, the design effect was greater than one. This complex sample design has been taken into account when calculating standard errors. All point estimates and proportions presented in this article have been calculated using data weighted by the design weights.

EU-SILC is a study of households. However, as no reliable frame of households or addresses was available, persons aged 14 or older were sampled first and the household that they were residing in was included at the second step. In the new part of the sample, advance letters were addressed to the sampled person and interviewers were first instructed to check whether the sampled person was still residing at the

address. If they were, then the household interview had to be conducted with the person responsible for the accommodation, who did not have to be the person originally selected from the register.

Full interviewer assignment for EU-SILC consisted of a household interview with a person responsible for the accommodation (or the person who responded to the household questionnaire in the previous wave) and an individual interview with all household members aged 15 or older.

The analysis in this paper draws only on frame data, paradata and register data; the actual information collected during the interviews was not used.

4.2 Register data

Everybody in the Population Register has a unique personal identification number. This number is used in all official tax and benefit dealings with the state and is therefore an identifier in most centrally held registers. Personal identification numbers of all persons selected for the Population Register were available in the sample file. This number was used to link the data for all originally sampled persons who were in the scope of fieldwork in 2007 to the Tax and Customs Board (CTB) register. Linking was deterministic, as unique identifier was available for all persons, and was carried out for respondents and non-respondents alike[2]. EU-SILC collects income information retrospectively about the previous calendar year. For this reason, 2007 survey data was linked to 2006 register data (declarations filed in 2007).

Although the CTB register contains information on some other types of income besides wages and salaries, this data will not be used in this paper for conceptual clarity.

As the Population Register is a register of persons and not of households, the household composition of selected persons is not available from the register for the

[2] According to the national legislation, Statistics Estonia can link survey data to register data without an informed consent of sample members. As a result it was possible to carry out a complete linkage.

new part of the sample. Personal identification numbers for household members other than the selected person were therefore collected during the fieldwork as a part of the interview. Consequently the identification numbers were generally available for all members of households who had already responded in the previous waves of the study, but not for household members of the first wave non-respondents. For this reason, the analysis in this paper will be restricted only to the persons selected for the sample in the first year. As contact is sought with the whole household residing with the named person, it would be more appropriate to use information about the total income of the household. Yet salaries of members of one household tend to be correlated (Lam, 1988), so analysing selected persons only still amounts to a valid albeit more conservative test of the hypotheses.

The data for the new sub-sample included all cases that were sampled for the study. The remaining sub-samples only contain cases that were in the scope of fieldwork for the 2007 study. This means that non-respondents from any of the previous waves were excluded. In addition to this, as we specified our research question in terms of co-operation, we further excluded cases that were not contacted or not able to respond in the current wave.

4.3 Paradata

Basic paradata was available for all cases in the scope of fieldwork. The following information was used as a part of this analysis:

- month when a case was issued for fieldwork[3],
- final outcome code,
- outcome code for each call made and
- mode of each call (face-to-face or telephone).

4.4 Frame information

The Population Register contains basic demographic (gender and date of birth) and geographical information about each person. Geographical information was used as

[3] This is March to May for the new sub-sample and March to June for the panel sample. All cases remained in field until the end of the fieldwork period. This means that cases issued earlier had a longer fieldwork period than cases issued in May or June, and interviewers could make more attempts.

two dichotomies: urban or rural based on the type of settlement[4] and capital region (Harju county including Tallinn) and the rest. The geographical information refers to the final traced address in 2007. In the majority of cases this coincides with the address in the Population Register, resulting in geographical information being different in only two per cent of the cases. The final address was used rather than the originally selected one, because the actual place of residence is likely to have more direct effect on the co-operation probability than the registered place of residence.

5. Analysis methods

The descriptive results are presented first, followed by the results of a modelling exercise. To test the hypotheses about the relationship between salary and co-operation propensity (conditional on contact) models were fitted separately to first year and panel sample using a probit link function. Probit models were preferred to logit models, because the underlying variable that is being modelled (co-operation propensity) is continuous.

Co-operating with a survey request were defined here as somebody in a household responding to at least the household questionnaire. Response to the individual questionnaire was not taken into account, as mechanisms of within-household non-response are likely to be different from household level non-co-operation. However, this decision is unlikely to have a great impact, because the extent of within-household non-response was extremely low with only 17 sample persons failing to respond to the individual questionnaire once the household interview had been completed.

To further investigate the relationship between salary and response behaviour, all contacted cases were divided into five groups with different probability to co-operate. As ease of contact is a different concept, calls made before the first contact were not been taken into account. These groups are:

[4] According to the definitions of Statistics Estonia urban settlements include cities, cities without municipal status and towns; rural settlements include small towns and villages.

1) *willing respondents* – cases where the interview was completed on the same call that the first contact was made,
2) *requiring an appointment* – where an appointment was made on the first contact and interview was completed on the second contact,
3) *reluctant respondents* – cases where more calls were needed after the first contact to complete the interview. This includes temporary refusals, non-contacts, broken appointments etc, but excludes cases classified as requiring an appointment,
4) *soft refusal* – cases where selected person either refused on subsequent calls or where an interviewer made conversion attempts after the first refusal and
5) *hard refusal* – cases that refused on the same call that contact was achieved and were not contacted again.

Sample sizes for each of these groups are presented in Table 1.

Table 1. Outcome by sub-sample

	1st year in sample	2nd – 4th year in sample
Contacted and able to respond	1,785	3,476
Refusals	337	143
Hard refusals	201	68
Soft refusals	156	81
Co-operating	1,448	3,333
Willing respondents	834	1,845
Require an appointment	446	1,076
Reluctant respondents	166	407

Base: All contacted and able to respond cases

To investigate the shape of a relationship between salary and response behaviour, separate models were run with salary as a continuous variable (in thousands of kroons), as a banded variable and as a quadratic transformation. Only models using banded salary are presented here as these were the best fit to the data.

All models are presented as nested sets, with salary variables entered on their own first and then controls included on the second step. The standard controls are

- dummy for capital region,
- place of residence (urban vs. rural),

- gender,
- age and
- month issued for fieldwork,
- year in sample (for panel models).

For the panel sub-sample, much richer set of controls was available from previous years' data. These were however not used to ensure comparability with the freshly selected sub-sample.

Interviewers differ by their abilities and expectations, which have been shown to influence their probability of achieving co-operation (Groves & Couper, 1998: 215). As persons living in the same area tend to be more alike in terms of socio-economic status and salary, then any effect observed in a usual probit model could be due to variation between interviewers and not sampled persons. To test this, each model presented here was also specified as random effects models using interviewer identifiers (n=61) as second level controls. The results of salary variables were not substantively affected, showing that any effects observed were independent of interviewers who had been assigned to the cases. As modelling interviewer effects is not the aim of this paper, only more parsimonious single level models are presented here.

6. Results

6.1 Descriptive results

Table 2 presents the proportion of persons who according to the register received salary in the previous calendar year separately for persons who were contacted and able to respond, persons who refused and persons who co-operated with a survey request. Table also presents a relative non-response bias due to refusals, which is defined as

$$B(\bar{y}_r) = \frac{100 * (\bar{y}_r - \bar{y}_c)}{\bar{y}_c} \qquad (1)$$

where *r* stands for respondents and *c* for total sample that was contacted and able to respond.

Table 2. Share of salary earners by outcome and sub-sample

	1st year in sample	2nd – 4th year in sample
Contacted and able to respond	60.3	58.8
Refusal	65.3	72.0
Response	59.2	58.2
Relative non-response bias due to refusals	-1.8%	-1.0%

Base: All contacted and able to respond cases

60.3 per cent of cases in the contacted new sub-sample received a salary in 2006 (Table 2). The corresponding figure for those who responded to the household questionnaire was slightly lower at 59.2 per cent resulting in a 1.8 per cent downward bias. The bias was reduced to 1 per cent for cases that had already been interviewed at least once. Only the bias in the new sub-sample was statistically significant at 0.05 level.

A similar small bias appeared in the case of average annual gross salary of salary earners (Table 3). Refusals had higher salary in both sub-samples, but since the numbers involved were not large, this lead to only 1 per cent bias in the new sub-sample and even smaller 0.3 per cent bias in the panel sub-sample, neither of which was statistically significant.

Table 3. Mean annual gross salary (EEK) by outcome and sub-sample

	1st year in sample	2nd – 4th year in sample
Contacted and able to respond	83,334	77,755
Refusal	86,682	82,437
Response	82,474	77,506
Relative non-response bias due to refusals	-1.0%	-0.3%

Base: All salary earners who were contacted and able to respond

It is interesting to observe that while the bias in each sub-sample was not especially large, the cumulative effect of non-response over the panel life was substantial. If the annual salary of contacted first year sub-sample is taken as a gold standard, then the total bias in interviewed panel sample compared to year one sample was 7.0 per cent.

Table 4. Co-operation rate by annual salary quintile and sub-sample

	Lowest quintile	II quintile	III quintile	IV quintile	Highest quintile
1st year in sample	78.6%	80.7%	81.7%	83.2%	72.7%
2nd – 4th year in sample	96.3%	92.7%	96.0%	94.9%	95.0%

Co-operation rate – share of interviewed cases out of all contacted and able to respond cases
Base: All salary earners who were contacted and able to respond

Finding of no substantial difference in mean does not necessarily imply that contacted sample persons with different annual salary levels were all equally likely to respond. To investigate this further, the contacted sample was divided into five quintiles based on salary (Table 4). The co-operation rate increased steadily with salary until the fourth quintile, rising from 79 to 83 per cent. However, it then fell steeply by ten percentage points to the lowest level of 73 per cent. No such pattern was evident in the panel sub-sample, where it fluctuated around 95 per cent without a clear direction.

6.2 Models results

The first set of models explores the overall co-operation propensity (Table 5). As could be expected from the descriptive results, those in the highest salary quintile were in general less likely to respond than those with lower salary. Also salary earners as a whole had lower co-operation propensity than those who did not receive a salary in the previous calendar year. It should be noted that when the highest quintile was not included in the model, there remained no statistically significant relationship between salary and co-operation with a survey request. Thus there appears to be no gross middle-class bias.

However, neither of these effects remained significant after other independent variables had been included. Instead, dummy for capital region, type of settlement, gender and age became significant. People living in the capital region, in urban settlements and those in younger age groups were less likely to co-operate. Additionally, after controlling for everything else, males were also less likely to respond.

Table 5. Estimates of probit models of co-operation (conditional on contact) by sub-sample

	1st year in sample				2nd – 4th year in sample			
	Restricted model		Full model		Restricted model		Full model	
	Coef	SE	Coef	SE	Coef	SE	Coef	SE
Salary quintile								
I quintile	0.176	0.143	0.143	0.147	0.145	0.173	0.155	0.181
II quintile	0.259	0.144	0.173	0.148	-0.186	0.159	-0.277	0.171
III quintile	0.289	0.147	0.198	0.152	0.098	0.175	0.030	0.183
IV quintile	0.353*	0.149	0.264	0.154	-0.011	0.168	-0.032	0.175
Received salary (yes)	-0.385*	0.118	-0.212	0.125	-0.272	0.145	-0.124	0.160
Capital region (yes)			-0.235*	0.080			-0.263*	0.097
Type of settlement (urban)			-0.459*	0.084			-0.230*	0.097
Gender (female)			0.153*	0.075			0.048	0.090
Age			0.008*	0.002			0.008*	0.003
Month of issuing								
March			-0.132	0.087			0.129	0.135
April			-0.087	0.092			0.068	0.124
May							-0.003	0.119
Year								
2nd							-0.470*	0.136
3rd							-0.527*	0.112
Constant	0.998*	0.058	0.831*	0.161	1.915*	0.072	1.973*	0.225
F	2.460*		8.080*		3.190*		6.510*	
N			1,785				3,476	

* p<=0.05

Reference categories: Quintile: V quintile; Month: May for 1st year, June for 2nd – 4th year; Year: 4th

Base: All contacted and able to respond cases

Finding of lower response probability in bigger cities is a common result in non-response research. This has traditionally been linked to lower levels of social trust in some urban areas with fear of crime being one of its main manifestations. People in towns and cities are also more likely to be employed and to earn higher salaries, which partly explains the disappearance of the effect of salary when more controls were added.

The positive effect for age is an interesting finding. Most previous authors have reported either negative or non-significant association between age and co-operation

probability (e.g. Goyder, 1987: 98). However, in the most comprehensive study to date Groves and Couper (1998: 150) found a curvilinear relationship, with the youngest and oldest age groups more likely to respond. The models presented here tested for a linear effect. We ran separate models (not included here) with alternative transformations of age variable to investigate its effect further and found that in the fresh sub-sample the probability to co-operate increased dramatically in the older age groups (65 and older) and was constant in younger age groups.

The picture was different in the case of panel sample. As could be expected from the descriptive results, salary of a sample member or whether they received it at all made no difference to their co-operation probability. However, the effects of other controls remained similar to the first year sub-sample with only gender loosing its significance. Dummies for year revealed that people who had already participated in the study for three years were more likely to respond after being contacted than those with shorter panel histories.

The next set of models takes a closer look at co-operation probability by modelling the competing probabilities of belonging to one of the five groups formed on the basis of willingness to respond.

Looking at the first year sub-sample first (Table 6), the receipt of salary and the amount salary had a significant effect on the probability of refusing outright and on being a reluctant respondent. Interestingly, the shape of these two effects was different – in the case of hard refusals, the main distinction was between the highest quintile and the rest, while the probability of being a reluctant respondent increased linearly with salary and was the highest for those with the largest salaries. There was however no effect of being in the highest quintile on the probability of belonging to the other, less determined refusal category. While the effect on the probability of needing an appointment was also not significant in this particular model specification, the coefficients for the third and fourth quintile were in fact very similar suggesting that the relationship between salary and need for an appointment may have had a different shape. To test this we ran the model again (results not presented here) and

found that those in the third, fourth and fifth quintile were significantly more likely than the rest to make an appointment with an interviewer.

Table 6. Estimates of probit models of willingness to respond, first year sub-sample

	Hard refusal		Soft refusal		Reluctant respondent		Requiring an appointment	
	Coef	SE	Coef	SE	Coef	SE	Coef	SE
Salary quintile								
I quintile	-0.565*	0.235	-0.241	0.240	-0.841*	0.249	-0.346	0.205
II quintile	-0.446	0.233	-0.347	0.248	-0.606*	0.232	-0.340	0.205
III quintile	-0.492*	0.243	-0.124	0.249	-0.434	0.232	-0.008	0.204
IV quintile	-0.522*	0.244	-0.289	0.261	-0.347	0.235	-0.024	0.205
Received salary (yes)	0.496*	0.195	0.388	0.211	0.842*	0.197	0.465*	0.174
Capital region (yes)	0.361*	0.123	-0.102	0.134	-0.777*	0.152	-0.108	0.108
Type of settlement (urban)	0.824*	0.140	0.462*	0.131	0.415*	0.126	0.132	0.104
Gender (female)	-0.062	0.116	-0.175	0.121	0.056	0.118	0.158	0.097
Age	-0.002	0.003	-0.016*	0.003	-0.013*	0.003	-0.002	0.002
Month of issuing								
March	0.228	0.137	0.407*	0.142	0.472*	0.139	0.353*	0.112
April	0.135	0.141	0.154	0.151	0.206	0.149	0.037	0.119
Constant	-1.815*	0.270	-0.849*	0.249	-1.237*	0.257	-1.018*	0.216
F	4.660*							

* p<=0.05
Reference category: willing respondent
Base: All contacted and able to respond cases

Those who received no salary in the previous calendar year were less likely to be determined refusers, reluctant respondents and to require an appointment as opposed to consenting to an interview the first time an interviewer found them at home. Unlike in the case of overall co-operation, these effects remained significant even after the rest of the independent variables had been controlled for.

Of the control variables, people living in the capital region were more likely to be outright refusers, but less likely to be reluctant respondents. Urban dwellers, however, were more likely to belong to both of these categories as well as to refuse in not so decisive manner. Older sample members were less likely to fall into categories that were characterised by more than one call-back by an interviewer (soft refusals and

reluctant respondents), but they were not less likely to be outright refusers as opposed to willing respondents compared to everybody else.

Also being issued in March clearly gave interviewers more time to make attempts, as is revealed by a higher probability of soft refusals, reluctant response and requiring an appointment, but not being an outright refuser in the case of this group.

Table 7. Estimates of probit models of willingness to respond, second, third and fourth year sub-samples

	Hard refusal		Soft refusal		Reluctant respondent		Requiring an appointment	
	Coef	SE	Coef	SE	Coef	SE	Coef	SE
Salary quintile								
I quintile	-0.322	0.292	-0.238	0.280	-0.217	0.173	-0.320*	0.143
II quintile	0.168	0.262	0.173	0.276	-0.084	0.172	-0.265	0.145
III quintile	-0.439	0.322	0.059	0.281	-0.181	0.179	-0.164	0.146
IV quintile	-0.077	0.275	0.140	0.279	0.083	0.174	-0.039	0.145
Received salary (yes)	0.545*	0.240	0.199	0.256	0.400*	0.152	0.500*	0.125
Capital region (yes)	0.186	0.152	0.414*	0.148	-0.102	0.102	0.129	0.083
Type of settlement (urban)	0.442*	0.152	0.236	0.148	0.398*	0.088	0.076	0.071
Gender (female)	0.024	0.145	0.031	0.135	-0.050	0.083	0.130	0.069
Age	0.000	0.004	-0.018*	0.004	-0.010*	0.002	-0.008*	0.002
Month of issuing								
March	-0.209	0.243	0.228	0.192	0.217	0.130	0.348*	0.103
April	-0.020	0.203	-0.030	0.181	-0.032	0.128	-0.039	0.102
May	0.189	0.191	-0.107	0.191	0.156	0.123	0.088	0.101
Year								
2nd	0.349	0.222	0.591*	0.210	0.103	0.123	-0.029	0.101
3rd	0.465*	0.175	0.659*	0.174	0.029	0.095	-0.041	0.076
Constant	-3.085*	0.388	-2.181*	0.328	-1.121*	0.218	-0.644*	0.177
F	4.030*							

* p<=0.05
Reference category: willing respondent
Base: All contacted and able to respond cases

The same model was also fitted to the pooled data set of second, third and fourth year cases (Table 7). It is immediately evident that the effects of the amount of salary observed in the case of the new sub-sample have disappeared. Instead, those in the highest quintile were somewhat more likely to make an appointment for an interview

than those in the lowest two quintiles. The effect of salary receipt, however, remained exactly the same as in the case of the new sub-sample.

The effect of type of settlement and age also remained similar to the new sub-sample, while the effect of living in the capital region and being issued for fieldwork earlier were less significant in the case of the panel sub-sample. Finally, those who had granted an interview on more occasions were less likely to belong to either of the refusal categories, while there was no effect on the probability of being a reluctant respondent.

7. Discussion and conclusions

7.1 Non-response mechanisms

The results of our research do not support the wide-spread assumption of the middle class bias in survey participation. What we do find is a lower probability of responding among those with highest salaries. This bias disappears once basic socio-demographic characteristics are controlled for. However, this apparent lack of statistical significance hides substantial effect of salary on the way non-response comes about – it was shown that those in the highest salary quintile were more likely to be hard refusers compared to everybody else, while there was no salary related effect on soft refusals.

What could be the social mechanisms that bring about such results? The hypothesis of middle class bias assumes that low levels of generalised trust and civic responsibility dominate over other factors among those with the lowest salaries, leading to a lower propensity respond. Our results show that this effect is probably offset by greater leverage that this group attributes to the potential gain from enhanced social policy measures. On the other hand, while generally more trusting and willing to engage in civic activities, those with higher salaries seem to attach disproportionally greater significance to the time required to respond and / or to the general purpose of social surveys.

Interviewers are trained to sustain the conversation on a doorstep long enough to learn more about the reasons behind persons reluctance, so that their arguments could be tailored to the concerns of a particular person (Groves & Couper, 1998: 210). They are advised to avoid flat refusals by retreating when respondent seems likely to make such statements. This gives an interviewer another opportunity to call at the address at a later date to try a different conversion strategy. This will be much harder where a definitive refusal has been received.

Our results show that persons receiving the highest salaries are substantially more likely to respond to interviewers' initial request with a direct refusal. We do not know for sure at what point in a doorstep interaction these refusals happen, but it is possible that some of these take place quite early on when an interviewer has not yet had a chance to deliver his or her arguments. This seems to indicate a more deep-rooted disposition on the part of sample members rather than factors that could be considered more situational such as survey topic or time pressure.

To test the time pressure hypotheses further we ran the models again including a control for number of calls interviewer made at an address before achieving contact (results not presented here). Being hard to contact can be regarded as a proxy for the amount of time spent at home and thus being available for an interview. Inclusion of this measure of time availability left other coefficients largely unchanged, suggesting that the tendency of high salary sample members to refuse was not related to them spending less time at home.

Interestingly, indicator for contact difficulties had a statistically significant effect in some of our models, which is at odds with previous findings (e.g. Lynn et al., 2002: 144). Those who were harder to reach but were eventually contacted were more likely to become hard refusals. This could be related to interviewers' calling strategies: they may consider the likelihood of finding a hard to contact person at home for the second time low and thus find it more efficient to make further attempts at households that are easier to contact.

The only other hypothesis that suggested a steep fall in co-operation probability at the highest salary level concerned the attitudes towards state involvement in welfare provision and people's lives. It was argued that either due to ideological convictions, lack of personal gain or limited knowledge of social problems, persons with a higher social standing are less likely to be empathetic to the need for government involvement in improving social welfare, an argument that most social surveys use as a selling strategy. The higher probability of non-salary earners to be willing respondents as opposed to hard refusers and reluctant respondents can also be seen as a support to this hypothesis as this group is more likely to benefit from the welfare state provision.

How does this fit in with the finding that probability of being a reluctant respondent increases linearly with salary? Repeated call-backs seem to indicate motivations that are more amenable to interviewer arguments play a role here. The fact that higher salary earners are not more likely to be soft refusers, i.e. people who eventually refuse after a few call-backs, seems also to suggest that negative dispositions towards survey participation however motivated are less of an issue here. Instead interviewers may be struggling to get hold of these people after having first made contact with someone else in the household. However, without controlling for the number of household members that is likely to increase the probability of contact with a household, this will remain a hypothesis.

7.2 Implications for non-response research and survey design

Our results demonstrate the dangers of extrapolating from reluctant respondents to refusers. If the processes that lead to these two outcomes are different as was suggested above, then it can result in an increased bias in substantive estimates and not a decrease. In the current example, the co-operation probability of those in the middle of the salary range would be underestimated while the co-operation probability of those with highest salaries would be overestimated.

The paper also involved comparisons between a fresh cross-sectional sample and a panel sample of persons who had already been interviewed in previous waves. The

results discussed so far have been based on the findings from the first year sub-sample. The findings from the panel sample relating to the effect of salary were substantively different. Almost none of the effects that were observed in the case of the new sub-sample appeared in the panel sample, suggesting that non-response process is much less predictable among panel members who have all co-operated before. This shows that results from an analysis of co-operation in panel surveys, where non-respondents from previous waves are excluded, are not necessarily indicative of non-response bias resulting from the first wave non-co-operation.

If people differ in the importance that a particular survey attribute has in their decision to co-operate, then it is unlikely that a blanket approach to securing their participation is the most effective strategy. Instead, a recruitment effort should seek to address these idiosyncratic concerns. While the notion of interviewers tailoring their introductions at a doorstep is generally accepted in the survey research community, there has been little research into how the other components of initial contact (e.g. advance letters) could be similarly tailored. A recent exception is work by Fumagalli and colleagues who experimented with tailoring between wave communications with respondents in a panel survey and reported positive effect on the response (Fumagalli, Laurie & Lynn, 2010).

Currently most social surveys emphasise their relevance for future policy developments, both in advance letters and during interviewer training. However this paper has shown that this argument may not hold the same leverage for everybody. It is possible that it has a negative effect on the participation of the highest earning members of population. Thus adapting an advance letter to this group may have positive effects in terms of response. While income of a particular sample member cannot usually be known in advance, there is often some indirect evidence in the form of local area information available at the sampling stage that could be used to target communication.

7.4 Limitations

Firstly and most importantly we have no direct measures of motivation for non-participation. Lower importance placed by higher salary earners on social surveys while probable would need further investigation. Also while salary is closely related to socio-economic status, it does not capture all of its dimensions. Additionally we have treated those with no salary income as one group, while in practise they are far from homogeneous. For example reasons that the unemployed have for not co-operating are likely to be different from those of stay-at-home mothers.

Secondly, one of the major problems in non-response research has been the preponderance of case studies. This means that mechanisms that are specific to a particular survey cannot be easily distinguished from more general features that apply to a wider range of social surveys. The results presented in this paper are also based on only one study. However we believe that by explicitly separating non-response mechanisms that are general from those that are survey specific we have been able to avoid this confusion to an extent. The mechanisms that our results suggest to be mainly responsible to non-response patterns that we observe are related to more general features of social surveys and should thus be applicable beyond the particular study used here as an example.

Despite these limitations, what this paper has shown is that no net bias in a mean of a continuous variable may hide a net bias in the distribution of a variable. It also demonstrated the importance of using paradata to get a more detailed picture of co-operation process. Additionally, it has shown the usefulness of bridging the gap between substantive and methodological research and using the findings from other disciplines to explain non-response behaviour.

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