Survey Research Methods (2013)
Vol.7, No.2, pp. 133-144
ISSN 1864-3361
http://www.surveymethods.org

Placement, Wording, and Interviewers: Identifying Correlates of Consent to Link Survey and Administrative Data

Joseph W. Sakshaug
Institute for Employment Research, Nuremberg, Germany
Ludwig Maximilians University of Munich

Valerie Tutz
Institute for Employment Research, Nuremberg, Germany
Ludwig Maximilians University of Munich

Frauke Kreuter
University of Maryland, College Park, USA
Institute for Employment Research, Nuremberg, Germany
Ludwig Maximilians University of Munich

Record linkage is becoming more important as survey budgets are tightening while at the same time demands for more statistical information are rising. Not all respondents consent to linking their survey answers to administrative records, threatening inferences made from linked data sets. So far, several studies have identified respondent-level attributes that are correlated with the likelihood of providing consent (e.g., age, education), but these factors are outside the control of the survey designer. In the present study three factors that are under the control of the survey designer are evaluated to assess whether they impact respondents' likelihood of linkage consent: 1) the wording of the consent question; 2) the placement of the consent question and; 3) interviewer attributes (e.g., attitudes toward data sharing and consent, experience, expectations). Data from an experiment were used to assess the impact of the first two and data from an interviewer survey that was administered prior to the start of data collection are used to examine the third. The results show that in a telephone setting: 1) indicating time savings in the wording of the consent question had no effect on the consent rate; 2) placement of the consent question at the beginning of the questionnaire achieved a higher consent rate than at the end and; 3) interviewers' who themselves would be willing to consent to data linkage requests were more likely to obtain linkage consent from respondents.
Keywords: administrative data; informed consent; record linkage; experiment

1 Introduction

In times of tight survey budgets and increasing demands for more statistical information the linkage of survey data to administrative data sources is a worthwhile consideration. Not only does data linkage offer possible cost savings by reducing the length of the questionnaire, it offers attractive scientific possibilities for researchers interested in studying important substantive and methodological phenomena (Lillard and Farmer 1997; Calderwood and Lessof 2009). Studies utilizing linked survey and administrative data sources have made important contributions to our understanding of various substantive topics, including healthcare spending among older populations (Hogan et al. 2001; Lubitz et al. 2003; Peikes et al. 2009), lifetime earnings and retirement planning (Hurd and Zissimopoulos 2003; Gustman and Steinmeier 2005; Scholz et al. 2006), as well as methodological topics such as the accuracy of survey self-reports and the impact of nonresponse bias on survey estimates (Olson 2006; Kreuter et al. 2010; Sakshaug et al. 2010).

Contact information: Joseph W. Sakshaug, Institute for Employment Research, Nuremberg, Germany and Ludwig Maximilians University of Munich, Germany, e-mail: joesaks@umich.edu

Although survey and administrative data are collected in fundamentally different ways, they tend to complement the strengths and weaknesses of each other reasonably well. Administrative data are usually collected for administrative purposes and without specific statistical motive. These data are typically collected on the same individuals over a long period of time. Designing an equivalent panel study and collecting data of the same dimension would require considerable efforts and costs. A weakness of administrative data is that often only few variables are collected and new variables cannot be added per a researcher's request, whereas surveys allow researchers to ask questions tailored to specific research interests. Hence, linking both data sources together can produce a significant amount of information that would be otherwise difficult to obtain from a single data source.

There are several record linkage techniques for matching survey and administrative records, including statistical matching (Rubin 1986; Moriarity and Scheuren 2001; D'Orazio et al. 2006), probabilistic linkage (Jaro 1995; Blakely and Salmond 2002; Schnell et al. 2009), and exact linkage (Winkler 1995). Here we focus on exact linkage. In applications of exact linkage, records are matched based on one or more unique identifiers (e.g., Social Security number) provided that respondents consent to the linkage. Obtaining informed consent from respondents is typically needed to en-

sure that they agree to the intended uses of their administrative data and are aware of any potentials risks (General Accounting Office 2001). Linkage consent rates can vary substantially across household surveys and administrative data targets with consent rates in some surveys ranging from (in percentages) the mid-20's to the high 80's (Sakshaug and Kreuter 2012).

Achieving high consent rates is important to avoid significant amounts of missing data and minimize the risk of bias in inferences obtained from the combined data. Several studies have identified correlates of consent, including sociodemographic characteristics, key survey variables such as respondents' health status or their dependence on welfare, and indications of interview resistance measured through item nonresponse and interviewer observations of uncooperative behavior or privacy concerns expressed by respondents during the survey interview (Yawn et al. 1998; Olson 1999; Dunn et al. 2004; Bryant et al. 2006; Jenkins et al. 2006; Huang et al. 2007; Knies et al. 2012; Sakshaug and Kreuter 2012; Sala et al. 2012; Sakshaug et al. 2012).

Unfortunately, these respondent-level correlates are fixed and cannot be modified in order to improve linkage consent rates. A worthwhile area of study is to therefore identify potential correlates of linkage consent that *can* be modified at the design stage. This is an underdeveloped area in the linkage consent literature. In this article, three modifiable design features that may influence respondents' likelihood of linkage consent are considered: 1) the wording of the consent question; 2) the placement of the consent question and; 3) interviewer attributes.

2 Background

2.1 Wording of Consent Request

When administering the consent request, interviewers are typically instructed to read to respondents a script containing general details about the proposed linkage (e.g., description of data sources, rationale for linkage) as well as the actual consent question. How the request is worded and how the linkage information is conveyed varies a lot across studies and data collectors, and is influenced by Institutional Review Boards (or equivalent independent ethics committee responsible for approving the study). (See Appendix Table 5 for examples of scripted linkage consent requests from a small set of international studies.)

While there is little experimental evidence suggesting that wording matters in linkage consent applications, there is some evidence that wording can make a difference in requests for survey participation. For example, some studies have shown that stronger assurances of data confidentiality lead to higher response rates, with the exception that stronger assurances can backfire and lead to lower participation rates and more expressions of suspicion when the survey topic is innocuous and the confidentiality risk is minimal (Singer et al. 1992, 1995). Based on the tenets of Prospect Theory (Kahneman and Tversky 1979), Tourangeau and Ye (2009) showed that framing the survey request in a way that emphasizes the negative consequences of nonparticipation ("loss" framing) resulted in a higher rate of follow-up interviews than emphasizing the benefits of participation ("gain" framing). The manipulation of other content items such as survey topic and sponsorship showed no appreciable effect on participation rates (Singer 1993; Houtkoop-Steenstra and Van den Bergh 2000; Groves et al. 2004; Tourangeau et al. 2009).

According to rational choice-based theories the framing of requests can matter. For example, leverage saliency theory, which is used to explain differences in survey participation (Groves et al. 2000), states that a person's likelihood of participation is determined by a number of factors that are weighted differently by each person. In practice, leverage saliency theory is applied by identifying factors that are believed to be attractive to a particular sample person (e.g., incentives) and making them salient during the survey request. In the context of linkage consent this means that identifying beneficial aspects of the linkage and making them salient to respondents during the consent request may make the request more attractive to respondents. For example, the possible societal benefits of linkage (e.g., greater opportunities for policy-relevant research) may be emphasized to respondents during the request. Another potential benefit of linkage that may be attractive to respondents is the notion that data linkage capabilities allow for the design of more parsimonious questionnaires (and shorter interviews). That is, if the data linkage option wasn't offered, then it is plausible that the questionnaire would contain more items and extend the overall length of the interview. Whether mentioning this benefit is likely to have a positive effect on respondents' likelihood of consent is an open question and one that we explore in this study.

2.2 Placement of Consent Request

To date, the majority of linkage studies that we are aware of place the consent question near the end of the questionnaire. [For example, most of the studies cited in Sakshaug and Kreuter (2012, Table 1) placed the consent question at the end (or within the last third) of the questionnaire.] There are no "best practices" guiding the placement of the consent question and no experimental evidence suggesting that placement at the end yields higher consent rates than at the front of the questionnaire. Rather this practice is likely informed by conventional wisdom that emphasizes the importance of building rapport and establishing trust with sample persons before making sensitive data requests. Cantor and Cunningham (2002:66) support this viewpoint as it pertains to the placement of sensitive items. They state that:

> "Sensitive questions have higher rates of nonresponse and should be placed later in the questionnaire but still positioned logically so that the flow from one topic to the next is smooth. [...] Careful placement allows these questions to be asked after rapport has been established. This is especially true with initial contacts into the household. Asking sensitive questions within the first few minutes of the initial contact may turn respondents off unnecessarily."

Whether this advice applies to the placement of the linkage consent question is unclear. Evidence from the survey literature shows a mixed relationship between rapport and respondents' likelihood of consent to data linkage. For example, Jenkins et al. (2006) presented evidence of a positive relationship between rapport and consent: respondents whose previous interview was long (a proxy indicator of greater rapport with the interviewers or survey process) were more likely to provide consent. In contrast, Sala et al. (2012) observed some evidence of a negative relationship: the number of years a respondent participated in a panel survey was negatively associated with consent in the current wave. The authors speculate that this finding may have been driven by respondents who felt that they had already provided so much information over the course of the panel that obtaining additional data through linkage was not necessary (Sala et al. 2012:433).

Given the lack of a consistent relationship between rapport and consent when the consent question is placed at the end of the questionnaire (as was the case in the two studies cited above), it is worth considering other theories of compliance that may suggest alternative placements. Social psychology theories suggest foot-in-the-door techniques, referring to findings that subjects who receive (and comply with) a small request are more likely to comply with subsequent larger requests than those who do not receive (or refuse) the initial request (Freedman and Fraser 1966; Pliner et al. 1974). This phenomenon has been independently replicated in experimental studies (see DeJong 1979, for a review) and has had some success as a technique to increase response rates in large-scale survey applications involving dual contact or follow-up requests (Groves and Magilavy 1981; O'Keefe and Homer 1987; Groves et al. 1992; Hox and De Leeuw 2002).

The foot-in-the-door effect can also be interpreted from self-perception theory (Bem 1972) in that after agreeing to perform an initial request, a person may perceive themselves as the type of person who is agreeable to such requests (Cialdini et al. 1975). In the context of compliance within the survey interview, the theory might indicate that respondents are in a more agreeable mood at the beginning of the interview after they have just agreed to participate in the survey. In this scenario, placing the linkage consent question at the beginning of the questionnaire may elicit more compliance from respondents than placing it at the end.

The idea of changing the placement of the consent question originates at the Institute for Applied Social Science (*infas*) in Bonn. Around 2005 *infas* changed their consent question strategy and moved the consent request issued in their surveys from the end of the questionnaire into earlier parts of the questionnaire, where the topic of the survey questions is related to the type of data for which linkage consent was asked (e.g. the request for linkage with employment spells was asked in connection with questions about employment history). While their studies varied in subject matter and were carried out at different points in time with different study populations, *infas* did observe that the oft-used practice of asking for consent at the end of the interview may not be ideal from a consent rate perspective.[1] The strategy of explaining the consent request in close connection to the topical question was subsequently applied to surveys conducted at the Institute for Employment Research.[2]

2.3 Interviewer Attributes

Interviewers play a crucial role in obtaining linkage consent as they are often responsible for administering (and motivating) the consent request and addressing any questions and/or concerns respondents may have. Interviewers are differentially successful in obtaining linkage consent from respondents as interviewer-level consent rates can vary widely within a single survey (Korbmacher and Schroeder 2013; Sakshaug et al. 2012). Furthermore, interviewer effects (indicated by the presence of unexplained between-interviewer variation) have been found in multilevel models of consent, suggesting the existence of interviewer-level attributes that may explain differences between successful and less successful interviewers (Sala et al. 2012; Sakshaug et al. 2012). Studying attributes of successful interviewers is a worthwhile endeavor as identification of such attributes could potentially be incorporated into interviewer training procedures to improve overall performance in linkage consent studies.

The identification of interviewer-level correlates of linkage consent has received some attention in the literature, but is still an underdeveloped area of research. The role of interviewer socio-demographics tends to be largely unrelated to consent (Sala et al. 2012 Sakshaug et al. 2012) with one exception: age was shown to have a positive, curvilinear effect on consent (Korbmacher and Schroeder 2013). There is no evidence that more experienced interviewers achieve higher (or lower) consent rates than less experienced interviewers (Sala et al. 2012; Sakshaug et al. 2012). There is some evidence that interviewer performance in prior interviews (within the same survey) is related to consent. For example, Korbmacher and Schroeder (2013) and Sala et al. (2012) found that the cumulative number of interviews achieved prior to the current interview was negatively related to consent and the cumulative number of consents obtained in previous interviews was positively related to consent, respectively. Sala et al. (2012) also found no evidence of a relationship between interviewer personality traits (using the "Big Five" instrument; (John and Srivastava 1999) or attitudes toward persuasion and linkage consent (Sala et al. 2012)).

Additional attributes of interviewers that may influence respondents' likelihood of consent, but have not been considered, include personal views toward data sharing and expectations of obtaining consent in the survey. For example, it is possible that an interviewer who possesses a pessimistic attitude toward sharing their own data and who themself would not agree to the same linkage request (or other linkage requests) in the survey would be less likely to motivate respondents to consent to the linkage. Regarding interviewer expectations, there is evidence from the survey participation litera-

[1] Personal communication with Doris Hess, infas, 9/5/2012.

[2] Thanks to Rainer Schnell for pointing out the change in placements in other infas collected studies (see also Schnell 2011:320).

ture that interviewer expectations can be predictive of actual performance. Singer et al. (1983) found that interviewers' expectations of response rates prior to data collection were positively associated with their actual response rates. However, they found no strong relationship between expectations to achieving responses to individual items and item nonresponse, which they attribute to small variation in expectations at the item level. Although interviewers' attitudes toward data sharing and consent rate expectations are not under the control of the survey designer, these measures could potentially be used to indicate which interviewers are likely to have difficulties obtaining consent in the field and for which additional training and/or education regarding the linkage request may be required.

Building on what is already known about linkage consent, this paper begins to fill a gap in the survey literature by addressing the following research questions.

1. Does the wording of the linkage consent question influence whether respondents give consent? More specifically, does the mentioning of a particular benefit of linkage ("shorter interview") increase respondents' likelihood of consent?
2. Does the placement of the linkage consent question influence whether respondents give consent? Specifically, does asking for linkage consent at the beginning of the interview yield a higher rate of consent than asking at the end of the interview?
3. Are interviewers who themselves would be willing to consent to data linkage requests and interviewers who have high consent rate expectations more likely to obtain linkage consent from respondents?

Questions 1 and 2 are answered using experimental data collected from a German telephone survey where respondents were randomized to different placement and wording conditions. Question 3 is addressed using interviewer data collected prior to the same survey. Interviewers were asked to complete a detailed questionnaire containing questions related to the following topics: socio-demographics, expectations related to obtaining consent in the survey, willingness to consent to link their own data, among others.

3 Data and Methods

To understand how the placement and wording of the linkage consent question influences respondents' likelihood of consent, researchers from the Institute for Employment Research in Nuremberg, Germany commissioned a telephone survey that experimentally manipulated these features. Given the telephone nature of the interview, consent was achieved if respondents verbally agreed to have their survey and administrative data linked. The survey also contained additional embedded experiments, including the manipulation of different design aspects of filter questions that are not relevant to this study. The survey of German residents was conducted by the LINK institute from August to October, 2011.

3.1 Sampling and data collection

The sample was a random stratified sample consisting of 12,000 persons drawn from German federal databases used in the social security administration (Oberschachtsiek et al. 2009). The three strata consist of persons with various employment histories[3], relevant for the main portion of the questionnaire and a study on filter questions described elsewhere (Kreuter et al. 2012). Because the primary purpose of the study was a within-questionnaire experiment, no special refusal conversion attempts were conducted. To avoid any confounding, the experiment described below was fielded orthogonal to all other study elements.

A total of 2,400 completed interviews were achieved yielding a response rate for the CATI survey of 19.4% (AAPOR RR1; The American Association for Public Opinion Research (2011)). The response rates in each stratum were 22.4%, 21.1%, and 16.0%, respectively. These response rates are comparable to high-effort telephone surveys on similar general topics elsewhere (see for example Kohut et al. (2012)). However, the lack of refusal conversion could compromise the generalizability of the experimental results described below if the mechanisms for consent are different among cooperative and uncooperative respondents. We will come back to this point in the discussion section.

3.2 Wording experiment

In the consent wording experiment, respondents were randomized to receive one of two wordings of the consent question. In the first wording condition (referred to as the "benefit" wording), respondents were read the following (ENGLISH TRANSLATION):

> "To keep the interview as brief as possible, we would like to use for the analysis of the survey data parts of the data which are available at the Institute for Employment Research in Nuremberg, Germany.
> This is for example additional information of previous periods of employment, unemployment, and participation in active labor market policy programs during unemployment. In order to merge this data to the interview data I would cordially ask you to agree. Do you agree with it?"

The original German wording can be found in Appendix Table 6. In the second wording condition (referred to as "neutral" wording), respondents received the same wording as in the benefit group with the exception that the introductory phrase "To keep the interview as brief as possible" was

[3]The first stratum consists of people that received income support at some point within the last three years, the second stratum consists of people that were recently unemployed and received unemployment insurance benefits, and the last stratum consists of people that are employed with two or more employers over the course of the last ten years and never received any form of income support or unemployment insurance benefits.

removed. This benefit phrase is hypothesized to have a positive effect on respondents' willingness to consent. The rationale is that "keeping the interview as brief as possible" is seen as a positive benefit of offering the data linkage option and making this benefit salient during the request is hypothesized to increase a respondent's likelihood of consent. The benefit wording used here is inspired by a very similar wording used frequently in studies conducted at the Institute for Employment Research; in particular within the panel study 'Panel Arbeitsmarkt und soziale Sicherung'. [4] It is important to point out that respondents are not explicitly promised a shorter interview if they allowed their data to be linked. Instead the rationale is that if (most) respondents consent then the questionnaire can be shorter for everybody. All respondents received the same questionnaire regardless of providing linkage consent.

3.3 Placement experiment

In the placement experiment, respondents were randomized to receive the consent question in one of two locations. In the first placement condition, respondents received the consent question at the beginning of the interview (after verification that the right person was being interviewed). In the second placement condition, respondents received the consent question at the end of the interview. It is hypothesized that respondents receiving the question at the beginning will be more likely to consent to linkage than respondents who receive it at the end for reasons given above.

The wording and placement experiments were partially crossed forming 3 cells. The cells are described in Table 1. Respondents were randomly assigned to one of the three cells at the start of the interview: Benefit/Beginning, Neutral/Beginning, and Neutral/End with assignment probabilities 0.75, 0.20 and 0.05, respectively. There was no Benefit/End group because mentioning the benefit of a shorter interview when the interview is almost finished was not expected to have an effect on respondents' likelihood of consent. The Benefit/Beginning group received the highest assignment probability followed by Neutral/Beginning and Neutral/End because this group was predicted to yield the highest consent rate and achieving a high number of consents was desirable for purposes of another (unrelated) experiment in the survey.

3.4 Interviewer survey

Prior to the onset of data collection, all 38 interviewers were asked to complete a short questionnaire after their project training. All interviewers completed the questionnaire. In this questionnaire, interviewers were asked about a range of topics, including socio-demographic characteristics, expectations towards obtaining consents from respondents and whether they themselves would consent to a series of data linkage requests (including data requested in the current study). Interviewers were also asked whether they use social networks like Facebook, MySpace, or Twitter, to measure how comfortable they are to share information in a larger setting. The full list of interviewer variables (and their recoded values) is shown in Appendix Table 7.

3.5 Statistical analysis

To address the first two research questions of whether wording and placement of the consent question affects respondents' likelihood of consent, bivariate analyses are performed. The consent rates achieved in the experimental conditions are compared using a chi-square ($\chi 2$) test. The wording experiment and the placement experiment were analyzed separately. For the wording experiment data from respondents were used that received the consent question at the beginning of the questionnaire (second column in Table 1). For the placement experiment, only those experimental groups were used that received the same (neutral) wording but in two different placements (bottom row of Table 1).

For the analysis of interviewer effects, a mixed-effects logistic regression model with random intercept term is used to test the association between the dependent variable (consent) and interviewer characteristics collected from the interviewer survey. The mixed-effects model appropriately adjusts the standard errors of the estimates for the additional homogeneity arising from the clustering of respondents within interviewers. The mixed-effects model also allows for the calculation of the Intra Class Correlation (ICC), which is defined here as the proportion of the total model variance that is attributable to the interviewer. For a mixed-effects logistic model, where the response variable (consent) is binary, the ICC is: $\frac{\sigma_u^2}{\sigma_u^2+\frac{\pi^2}{3}}$ where σ_u^2 represents the variance of the random interviewer group. This parameter can be estimated from model output of a statistical software package. All analyses were performed using the *R* statistical software package. The mixed-effects logistic regression model was fit using the `nlme` Linear and Nonlinear Mixed Effects Models package (Pinheiro et al. 2004). Three interviewers (and their respective cases) were excluded from the analyses presented below, because of missing values in the interviewer covariates. The number of interviews conducted by each interviewer varied between 3 and 100 cases, with the vast majority of interviewers (75%) interviewing more than 50 cases. To assess sensitivity, we reran the consent model after manually dropping one interviewer at a time. The conclusions remained the same – the same covariates and interviewer variances were significant after dropping each interviewer.

During the model fitting process, multicollinearity was an issue. Seven of the interviewer items asking about willingness to consent to different data linkages (see Appendix Table 7) were correlated with each other to the extent that the model parameter estimates would take an unusually long time to converge (or would not converge at all). To remedy this problem, an additive index was created by summing the 0/1 responses to each of these items.

4 Results

Across all experimental conditions, a total of 2,281 (out of 2,400), or 95 percent of, respondents consented to the data

[4] http://fdz.iab.de/en/FDZ_Individual_Data/PASS/Working_Tools.aspx

Table 1: Consent wording and placement experiment cells with assignment probabilities and number of respondents

	Placement condition	
Wording condition	Beginning	End
Benefit	Assignment probability = 0.75 n = 1800	N/A
Neutral	Assignment probability = 0.20 n = 479	Assignment probability = 0.05 n = 121

Table 2: Contingency table of consent by wording condition

	No consent		Consent		Total
Wording condition	n	%	n	%	n
Benefit	81	4.5	1,719	95.5	1,800
Neutral	21	4.4	458	95.6	479
Total (n)	102		2,177		2,279

Table 3: Contingency table of consent by placement condition (neutral wording)

	No consent		Consent		Total
Placement condition	n	%	n	%	n
Beginning	21	4.4	458	95.6	479
End	17	14.0	104	86.0	121
Total (n)	38		562		600

linkage request. The consent rate varied somewhat across strata, with 94.4% in Stratum 1, 94.6% in Stratum 2, and 96.1% in Stratum 3. These consent rates are comparable to other consent requests for surveys commissioned by the IAB on similar populations (Bender et al. 2008; Christoph et al. 2008).

4.1 Wording experiment

Table 2 shows the results of the wording experiment. The consent rate for respondents who received the benefit wording was 95.5%. The consent rate for the neutral wording group was 95.6%. After adjusting for the clustering of respondents within interviewers, the difference between the two consent rates was not statistically significant ($\chi^2 = 0.00$; $p = 0.947$). Contrary to expectation the increased salience of a benefit gained from linkage consent did not change the linkage consent rates in this experiment.

4.2 Placement experiment

Table 3 shows the results of the two-way agreement between the placement conditions and consent. As mentioned before, here only the 600 respondents who received the neutral wording of the consent request are included. The group of respondents who received the consent question at the beginning of the interview achieved a consent rate of 95.6%, whereas those receiving the question at the end achieved a lower consent rate of 86.0%. The difference between the two consent rates is statistically significant (χ^2 =12.59; p = 0.0004) indicating the existence of a placement effect for the neutral wording condition in the hypothesized direction.

4.3 Interviewer effects

The last set of results examines the so-called "interviewer effect" and assesses whether interviewer characteristics (e.g., socio-demographics, willingness to consent, consent rate expectations) are correlated with respondents' likelihood of consent. The percentage of consents obtained by interviewers ranged from 75 to 99 and the majority of consent rates lie within the range of 85 to 99 percent.

Table 4 shows the results of a mixed-effects logistic regression model of respondent consent on interviewer covariates. Two models are shown: Model 1 shows the null model with no covariates and Model 2 contains the experimental placement indicator and interviewer variables. The models are fit cumulatively to assess the robustness of the placement effect and reduction in the intra-class correlation measure after incorporating interviewer-level covariates.

Regarding the interviewer-level covariates, the initial hypothesis was that interviewers who themselves would be willing to consent to hypothetical data linkages (including the same linkage requested in the survey) would be more likely to obtain consent from respondents. Some support for this relationship was found in Table 4: the number of different linkage requests that interviewers would hypothetically consent to was positively correlated with respondent consent. In contrast, interviewers who stated that they would be willing to consent to the same linkage request in the survey were not more (or less) likely to obtain respondent consent. The use of social networks (another indicator of willingness to share data) was also not associated with consent.

No support was found for the hypothesis that interviewers with higher consent rate expectations would obtain a higher rate of consent. Interestingly, interviewing experience showed a negative effect on linkage consent: interviewers who had 37 or more months (median) of interviewing experience were less likely to obtain consent from respondents than less experienced interviewers. Although most of the interviewer-level covariates did not achieve a statistically significant relationship with consent, adding these covariates to the model reduced the proportion of variance due to the interviewer by about half [ICC: 0.154 (null model) vs. 0.083 (interviewer model)].

Table 4: Multilevel Logistic Regression Model of Respondent Consent on Interviewer Characteristics. Coefficients are odds ratios

	Model 1 (Null)	Model 2 (Interviewer)
Placement Beginning		3.459***
Interviewer covariates		
Female		0.669
Age (19–64)		0.997
Most experienced (= 37 months)		0.281**
Income = 1750 Euro		1.551
Income is missing		1.373
Willingness to consent index (0–7)		1.244**
Would give consent in this survey		1.363
Uses social networks		1.231
Expected consent rate (%; 25–99)		1.017
Intra-Class Correlation	0.142	0.083
χ^2 vs. Logistic Regression	19.92***	9.42**
χ^2 of LR-Test against previous model		15.61***
Number of interviewers	35	35
Number of cases	2347	2347
p-value of LR-test		0.000 (df=9)

Note: ** $p < 0.01$; *** $p < 0.001$

The effect of consent question placement in the neutral wording condition remains significant after controlling for interviewer covariates. To examine the possibility that the placement effect is moderated through interviewer-level attributes, the placement variable was interacted with each of the covariates in the interviewer model. Out of all-possible interaction combinations, only two significant interactions were found (results not shown): 1) interviewers who reported higher incomes were more likely to obtain consent when respondents were asked at the beginning of the interview and; 2) interviewers who reported using social networks were more likely to obtain consent at the beginning of the interview.

5 Discussion

In this study, three modifiable design features were studied to assess their relationship with obtaining linkage consent from respondents: placement and wording of the consent request and attributes of the interviewer. The results of this study can be summarized with three primary findings.

First, although it is relatively common in surveys to place the consent question at the end of the questionnaire, the present study found that placing the consent question at the beginning of the questionnaire achieved an approximately 10 percentage point increase in the consent rate relative to when the question was placed at the end. Second, explicitly mentioning a particular benefit of data linkage ("shorter questionnaire/interview") during the consent request did not produce a higher rate of consent relative to the more neutral wording. Lastly, interviewers' willingness to consent to a series of hypothetical data linkage requests was positively related to respondents' likelihood of consent, but interviewers' willingness to consent to the same linkage request in the survey was not related to consent. Furthermore, interviewers' consent rate expectations prior to the survey were not associated with obtaining consent from respondents.

The results of this study have several implications for practice. For telephone surveys, it appears to be beneficial for survey organizations to place the consent question at the beginning of the questionnaire. That is, respondents seem to be in a more agreeable mood with respect to linkage immediately after having just agreed to participate in the survey. However, more experimentation is needed to replicate these findings and to fully understand the effect of placement in different settings, including different modes of data collection. For example, it is plausible that consent placement at the beginning of the interview would have less of an effect in a face-to-face survey where the social distance is smaller and opportunities for rapport building between respondent and interviewer over the course of the interview are greater than in a telephone survey; in which case, placement towards the end of questionnaire may be more beneficial. In a web survey, placement at the end of the survey might be preferred as sensitive requests at the beginning of the questionnaire may promote break-offs and decrease overall data quality, an issue that was not faced in the present study. Clearly, there is much work to be done with regard to asking for linkage consent in a web survey and studying the possible trade-off issues involving placement and overall data quality.

With regard to the wording of the consent request, there does not appear to be any noticeable impact of emphasizing possible benefits of data linkage. This finding is in line with findings from the survey participation literature, which find that various wordings of the survey request do not have a sizable effect on response rates (Singer 1993; Houtkoop-Steenstra and Van den Bergh 2000; Groves et al. 2004; Tourangeau et al. 2009). There are several possible causes of the null finding in the present study. One being that respon-

dents who are concerned about the risks potentially involved in data linkage, are unaffected by benefits due to any shortening of the questionnaire time. Also the mentioning of brevity might not have been heard or processed by respondents that just agreed to be interviewed. A stronger manipulation would be to express the benefit in minutes saved. It could also be the case that interviewers may have failed to read the benefit portion of the consent request. An analysis of time stamp data did not lend support to this possibility as the time it took for interviewers to administer the consent request in the experimental group was longer, on average, than in the control (neutral wording) group. Consequently, it is plausible that the benefit wording experiment would have yielded a different result in a different mode of data collection. For example, in a web survey, where the perceived length of the questionnaire can have a significant impact on break-offs (Yan et al. 2010), mentioning a time-sensitive benefit of linkage (to keep the interview as short as possible) may motivate more respondents to consent knowing that the web survey may have been even longer if linkage was not offered. Another suggestion for future research is to frame the consent question in a way that emphasizes the *negative* consequences of not providing linkage consent ("loss" framing). This idea is inspired by Tourangeau and Ye (2009) who found that emphasizing the negative consequences of not participating in a follow-up survey achieved a higher rate of response than when the positive benefits of participation were emphasized.

Assessing interviewers' willingness to consent to various data linkage requests, prior to the start of the field period, may provide telling information about their ability to obtain consent from respondents. As the data suggest, it appears that interviewers who themselves would not be willing to consent to linkage requests are less likely to convince respondents to do so in the survey. Although it is infeasible to remove these interviewers from the survey, survey personnel may instead provide them with further training or more detailed information regarding the linkage process. Such efforts may alleviate any concerns they may have and increase their comfort level with regard to asking respondents for consent. However, in order to identify and intervene on interviewers who are at risk of achieving low consent rates, it is necessary to collect information prior to the start of data collection. The present study was fortunate to collect detailed information on interviewers and link these data to respondents and, although the authors advocate that this practice be adopted by survey organizations worldwide, it may not be feasible for some studies to collect detailed information about their interviewers.

It is important to acknowledge that the results of this study may not be generalizable to all surveys, because it is based on a sample of German residents who met strict selection criteria based on their employment histories. Thus, one must exercise caution when generalizing these findings to the whole population of Germany or populations outside of Germany. Furthermore, no refusal conversion was done in the recruitment to this survey. It is possible that the effects found here do not hold for more reluctant respondents. One could for example imagine that very reluctant respondents are more likely to be taken aback by a request for linkage consent immediately following the request to participate in the survey, and would benefit from a rapport building process during the survey. Likewise, it is possible that the reluctant respondents would respond more to the potential time-benefit expressed in the wording experiment. The data at hand do not allow a test for differential mechanisms among cooperative and reluctant respondents. However, if such differential effects would be found, contact history data could be used to inform an adaptive questionnaire, where consent questions are placed relative to the response propensity of an individual respondent.

In conclusion, this study begins to fill a gap in the literature by focusing on some features of the linkage consent request that can potentially be modified by the survey organization to increase linkage consent rates. Mounting efforts to improve consent rates is a worthwhile objective as data linkage is considered by many to be a promising and relatively cheap supplement to traditional survey data collection.

Acknowledgements

Our sincere thanks go out to Aleksa Moentmann and the entire *LINK* team for their assistance in implementing the experiments. We also thank *infas* for pioneering linkage consent placement in IAB surveys. We are indebted to Stephanie Eckman, Barbara Felderer and Antje Kirchner for all their work in designing the Filterfragen study and monitoring the fieldwork. We thank Jaak Billiet, Stefan Bender, Rainer Schnell, Mark Trappmann, two anonymous reviewers, and the members of Frauke Kreuter's Munich-based research group for helpful comments and valuable suggestions to earlier versions of this article and the experiment itself. This work was partially supported by the Alexander von Humboldt Foundation.

References

Bem, J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 6, p. 2-62). New York: Academic Press.

Bender, S., Fertig, M., Görlitz, K., Huber, M., & Schmucker, A. (2008). *Well – unique linked employer-employee data on further training in germany* (No. 67). Essen: Ruhr Economic Papers.

Blakely, T., & Salmond, C. (2002). Probabilistic record linkage and a method to calculate the positive predictive value. *International Journal of Epidemiology*, *31*, 1246-1252.

Bryant, H., Robson, P., Ullman, R., Friedenreich, C., & Dawe, U. (2006). Population-based cohort development in alberta, canada: A feasibility study. *Chronic Diseases in Canada*, *27*, 51-59.

Calderwood, L., & Lessof, C. (2009). Enhancing longitudinal surveys by linking to administrative data. In P. Lynn (Ed.), *Methodology of longitudinal surveys* (p. 55-72). New York: Wiley.

Cantor, D., & Cunningham, P. (2002). Methods for obtaining high response rates in telephone surveys. In *Studies of Welfare Populations: Data Collection and Research Issues.* Washington D.C.: National Academy Press.

Christoph, B., Mller, G., Gebhardt, D., Wenzig, C., Trappmann, M., Achatz, J., et al. (2008). *Codebook and documentation of the*

panel study 'labour market and social security' (pass). Vol. 1: introduction and overview, wave 1 (2006/2007). Number 05.

Cialdini, R., Vincent, J., Lewis, S., Catalan, J., Wheeler, D., & Darby, B. (1975). Reciprocal concessions procedure for inducing compliance: The door-in-the-face technique. *Journal of Personality and Social Psychology*, *31*, 206-215.

DeJong, W. (1979). An Examination of Self-Perception Mediation of the Foot-In-The-Door Effect. *Journal of Personality and Social Psychology*, *37*(12), 2221-2239.

D'Orazio, M., DiZio, M., & Scanu, M. (2006). *Statistical Matching: Theory and Practice*. Wiley.

Dunn, K., Jordan, K., Lacey, R., Shapley, M., & Jinks, C. (2004). Patterns of consent in epidemiologic research: Evidence from over 25,000 responders. *American Journal of Epidemiology*, *159*, 1087-1094.

Freedman, J., & Fraser, S. (1966). Compliance without pressure: The foot-in-the-door technique. *Journal of Personality and Social Psychology*, *42*, 195-202.

General Accounting Office. (2001). *Record linkage and privacy: Issues in creating new federal research and statistical information.* Report of the General Accounting Office GAO-01-126SP.

Groves, R., Cialdini, R., & Couper, M. (1992). Understanding the decision to participate in a survey. *Public Opinion Quarterly*, *56*, 475-495.

Groves, R., & Magilavy, L. (1981). Increasing response rates to telephone surveys: A door in the face for foot-in-the-door? *Public Opinion Quarterly*, *45*, 346-358.

Groves, R., Presser, S., & Dipko, S. (2004). The role of topic interest in survey participation decisions. *Public Opinion Quarterly*, *68*, 2-31.

Groves, R., Singer, E., & Corning, A. (2000). Leverage-Salience Theory of survey participation: Description and an illustration. *Public Opinion Quarterly*, *64*, 299-308.

Gustman, A., & Steinmeier, T. (2005). The social security early entitlement age in a structural model of retirement and wealth. *Journal of Public Economics*, *89*, 441-463.

Hogan, C., Lunney, J., Gabel, J., & Lynn, J. (2001). Medicare beneficiaries' costs of care in the last year of life. *Health Affairs*, *20*, 188-195.

Houtkoop-Steenstra, H., & Van den Bergh, H. (2000). Effects of introductions in large-scale telephone survey interviews. *Sociological Methods and Research*, *28*, 281-300.

Hox, J., & De Leeuw, E. (2002). The influence of interviewers' attitude and behavior on household survey nonresponse: An international comparison. In R. M. Groves, D. A. Dillman, J. L. Eltinge, & R. J. A. Little (Eds.), *Survey nonresponse* (p. 103-120). New York: Wiley and Sons, Inc.

Huang, N., Shih, S., Chang, H., & Chou, Y. (2007). *Record linkage research and informed consent: Who consents?* BMC Health Services Research 7.

Hurd, M., & Zissimopoulos, J. (2003). *Saving for retirement: Wage growth and unexpected events.* Research Paper WP-2003-045, Michigan Retirement Research Center.

Jaro, M. (1995). Probabilistic linkage of large public health data files. *Statistics in Medicine*, *14*, 491-498.

Jenkins, S. P., Cappellari, L., Lynn, P., Jäckle, A., & Sala, E. (2006). Patterns of consent: evidence from a general household survey. *Journal of the Royal Statistical Society*, *Series A 169*, 701-722.

John, O., & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L. Pervin & O. Johns (Eds.), *Handbook of Personality: Theory and Research* (2nd ed., p. 102-138). New York: Guilford.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*, 263-292.

Knies, G., Burton, J., & Sala, E. (2012). *Consenting to health record linkage: evidence from a multipurpose longitudinal survey of a general population.* BMC Health Services Research 12.

Kohut, A., Keeter, S., Doherty, C., & Dimock, M. (2012). *Assessing the representativeness of public opinion surveys.* Technical report, The Pew Research Center for the People & the Press, Washington DC. www.people-press.org/files/legacy-pdf/Assessing%20the%20Representativeness%20of%20Public%20Opinion%20Surveys.pdf.

Korbmacher, J., & Schroeder, M. (2013). Consent when linking survey data with administrative records: The role of the interviewer. *Survey Research Methods*, *7*(2).

Kreuter, F., Eckman, S., Jaeckle, A., Kirchner, A., Presser, S., & Tourangeau, R. (2012). *Mechanisms of misreporting to filter questions.* Paper presented at the annual meeting of the American Association for Public Opinion Research. May 17, 2012. Orlando. Florida.

Kreuter, F., Mller, G., & Trappmann, M. (2010). Nonresponse and measurement error in employment research: making use of administrative data. *Public Opinion Quarterly*, *74*, 880-906.

Lillard, L., & Farmer, M. (1997). Linking medicare and national survey data. *Annals of Internal Medicine*, *127*, 691-695.

Lubitz, J., Cai, L., Kramarow, E., & Lentzner, H. (2003). Health, life expectancy, and health care spending among the elderly. *New England Journal of Medicine*, *349*, 1048-1055.

Moriarity, C., & Scheuren, F. (2001). Statistical matching: A paradigm for assessing the uncertainty in the procedure. *Journal of Official Statistics*, *17*(3), 407-422.

Oberschachtsiek, D., Scioch, P., Seysen, C., & Heining, J. (2009). *Stichprobe der Integrierten Erwerbsbiografien IEBS: Handbuch für die IEBS in der Fassung 2008.* FDZ Datenreport 03/209, IAB, Nürnberg.

O'Keefe, T., & Homer, P. (1987). Selecting cost-effective survey methods: Foot-in-the-door and prepaid monetary incentives. *Journal of Business Research*, *15*(4), 365-376.

Olson, J. (1999). Linkages with data from social security administration records in the health and retirement study. *Social Security Bulletin*, *62*(2), 73-85.

Olson, K. (2006). Survey participation, nonresponse bias, measurement error bias, and total bias. *Public Opinion Quarterly*, *70*(5), 737-758.

Peikes, D., Chen, A., Schore, J., & Brown, R. (2009). Effects of care coordination on hospitalization, quality of care, and health care expenditures among medicare beneficiaries. *Journal of the American Medical Association*, *301*, 603-618.

Pinheiro, J., Bates, D., DebRoy, S., & Sarkar, D. (2004). *nlme: Linear and nonlinear mixed effects models.* R Package version 3.1-104.

Pliner, P., Hart, H., Kohl, J., & Saari, D. (1974). Compliance without pressure: Some further data on the foot-in-the-door technique. *Journal of Experimental Social Psychology*, *10*(1), 17-22.

Rubin, D. (1986). Statistical matching using file concatenation with adjusted weights and multiple imputations. *Journal of Business and Economic Statistics*, *4*(1), 87-94.

Sakshaug, J., & Kreuter, F. (2012). Assessing the magnitude of non-consent biases in linked survey and administrative data. *Survey Research Methods*, *6*(2), 113-122.

Sakshaug, J. W., Couper, M. P., Ofstedal, M. B., & Weir, D. (2012).

Linking survey and administrative records: Mechanisms of consent. *Sociological Methods and Research*, *41*, 535-569.

Sakshaug, J. W., Yan, T., & Tourangeau, R. (2010). Nonresponse error, measurement error, and mode of data collection: Tradeoffs in a multi-mode survey of sensitive and non-sensitive items. *Public Opinion Quarterly*, *74*, 907-933.

Sala, E., Burton, J., & Knies, G. (2012). Correlates of obtaining informed consent to data linkage: respondents, interview, and interviewer characteristics. *Sociological Methods and Research*, *41*, 414-439.

Schnell, R. (2011). *Survey-Interviews: Methoden standardisierter Befragungen*. VS-Verlag.

Schnell, R., Bachteler, T., & Reiher, J. (2009). Privacy-preserving record linkage using bloom filters. *BMC Medical Informatics and Decision Making*, *9*(41).

Scholz, J., Seshadri, A., & Khitatrakun, S. (2006). Are americans saving 'optimally' for retirement? *Journal of Political Economy*, *114*, 607-643.

Singer, E. (1993). Informed consent and survey response: A summary of the empirical literature. *Journal of Official Statistics*, *9*, 361-375.

Singer, E., Frankel, M. R., & Glassman, M. B. (1983). The Effect of Interviewer Characteristics and Expectations on Response. *Public Opinion Quarterly*, *47*(1), 68-83.

Singer, E., Hippler, H.-J., & Schwarz, N. (1992). Confidentiality assurances in surveys: Reassurance or threat? *International Journal of Public Opinion Research*, *4*, 256-268.

Singer, E., Von Thurn, D., & Miller, E. (1995). Confidentiality assurances and response: A quantitative review of the experimental literature. *Public Opinion Quarterly*, *59*, 66-77.

The American Association for Public Opinion Research. (2011). *Standard definitions: final dispositions of case codes and outcomes rates for surveys.* Technical report. http://aapor.org/Content/NavigationMenu/AboutAAPOR/ StandardsampEthics/StandardDefinitions/StandardDefinitions2011.pdf.

Tourangeau, R., Groves, R., Kennedy, C., & Yan, T. (2009). The presentation of a web survey, nonresponse and measurement error among members of a web panel. *Journal of Official Statistics*, *25*, 299-321.

Tourangeau, R., & Ye, C. (2009). The framing of the survey request and panel attrition. *Public Opinion Quarterly*, *73*, 338-348.

Winkler, W. (1995). Matching and record linkage. In B. Cox et al. (Eds.), *Business survey methods* (p. 355-384). New York: Wiley.

Yan, T., Conrad, F., Tourangeau, R., & Couper, M. (2010). Should i stay or should i go? The effects of progress feedback, promised task duration, and length of the questionnaire on completing web surveys. *International Journal of Public Opinion Research*, *23*, 131-147.

Yawn, B., Yawn, R., Geier, G., Xia, Z., & Jacobsen, S. (1998). The impact of requiring patient authorization for use of data in medical records research. *Journal of Family Practice*, *47*, 362-365.

Appendix

Table 5: Wording of linkage consent requests for five studies

Survey	Linkage Consent Script
British Household Panel Survey, Wave 18(face-to-face)	[RF16] Finally, we would like to add some information from administrative health records to the answers you have given. We have sent you an information leaflet which details this and here is a permission form. Please read it, ask me any questions you may have and sign the form if you are happy for us to do this. [RF19] We would also like to add further information on your child's health and use of health services. Could you read through this form and sign it if you wish to give permission. [RF23] We would also like to add some information from educational and economic records to the answers you have given. Here is another information leaflet which details this and here is a permission form. Please read these, ask me any questions you may have and sign the form if you are happy for us to do this. [RF26] We would also like to add some information from economic records to the answers you have given. Here is another information leaflet which details this and here is a permission form. Please read these, ask me any questions you may have and sign the form if you are happy for us to do this. [RF28] We would also like to add further information on your child's education. Could you read through this form and sign it if you wish to give permission..
English Longitudinal Study of Ageing, Wave 1(face-to-face)	[FQCons] We have asked about your health and economic circumstances. To make this information complete we would like to find out more about your health and treatment and more about your National Insurance contributions, social security benefits and tax credits. We would like to collect this information from administrative records held by the Office for National Statistics, the National Health Service, Inland Revenue and the Department for Work and Pensions. Like everything else you have told us, the information collected from these records will be completely confidential. This form explains in more detail and you can ask me any questions that you may have.
Health and Retirement Study, 2010 (face-to-face; self-interview script)	[W314_W306] One of the most important parts of our study is to understand the financial situations of people in their retirement years. This is an important and challenging part of our research, and in order to obtain complete data for this research, we are asking our participants to complete a form authorizing us to obtain social security data on earnings and benefits. We want to assure you that the Health and Retirement Study is committed to taking the utmost care to protect the confidentiality of any information you give us, including the information on the form. Please take a minute to read the form. [W310] For the study's research purposes, would you authorize us to obtain your history of earnings and benefits administered by the Social Security Administration?
National Population Health Survey, Cycle 3 (1998-1999)CATI and face-to-face	[LINK-INT] We are seeking your permission to link information collected during this interview with provincial health information. This would include information on past and continuing use of services such as visits to hospitals, clinics, doctor's offices or other services provided by the province. [LINK-PERM] This information will be used for statistical purposes only. Do we have your permission?
Panel Survey of Income Dynamics, Wave 37 - CATI	[H62A] We would like to learn more about people's health and how health care is used. The best place to get this information is Medicare. We are therefore asking FES families to let us access these records**.** Even if you don't have any health conditions, it is important for statistical purposes to get this information from Medicare. Under the Privacy Act of 1974, providing your number is a voluntary decision. The benefits you may be receiving under Medicare will not be affected in any way by your decision. Could you tell me your Medicare number for this purpose?

Note: Survey URL to Linkage Consent Script:

British Household Panel Survey: http://www.iser.essex.ac.uk/bhps/documentation/pdf_versions/questionnaires/bhpsw18q.pdf

English Longitudinal Study of Ageing: http://www.ifs.org.uk/elsa/docs_w1/qu_wave1.pdf

Health and Retirement Study: http://hrsonline.isr.umich.edu/modules/meta/2010/core/qnaire/online/23hr10W.pdf

National Population Health Survey: http://www23.statcan.gc.ca/imdb-bmdi/instrument/3236_Q1_V3-eng.pdf

Panel Survey of Income Dynamics: ftp://ftp.isr.umich.edu/pub/src/psid/questionnaires/q2011.pdf

This table does not provide a review of linkage consent questions but rather illustrates a variety of different wordings in selected face-to-face, and telephone surveys, administered within cross-sectional and panel surveys.

Table 6: Wording of Linkage Consent Request

Um das Interview im Folgenden möglichst kurz zu halten, würden wir gerne bei der Auswertung der Befragung Auszüge aus Daten einbeziehen, die beim Institut für Arbeitsmarkt und Berufsforschung in Nürnberg vorliegen. Dabei handelt es sich zum Beispiel um zusätzliche Informationen zu vorausgegangenen Zeiten der Beschäftigung, der Arbeitslosigkeit und der Teilnahme an Maßnahmen während der Arbeitslosigkeit. Zum Zweck der Zuspielung dieser Daten an die Interviewdaten möchte ich Sie herzlich um Ihr Einverständnis bitten. Sind Sie damit einverstanden?

Table 7: List of interviewer variables collected among all 38 telephone survey interviewers. Variable counts may not sum to 38 due to missing interviewer data

Label	**Categories**	**Recoded categories**	**n**	**Mean/Percent (SE)**
Age of interviewer	Continuous	Not recoded	37	32.14 (2.10)
Gender of interviewer	1: female 0: male	Not recoded	30 8	78.95 (6.70) 21.05 (6.70)
Interviewer income	Continuous	1: = 1750 Euro 0: < 1750 Euro	14 14	50.00 (9.62) 50.00 (9.62)
Interviewer income missing	Continuous	1: Missing 0: Not missing	10 28	26.32 (7.24) 73.68 (7.24)
Months working as an interviewer	Continuous	1: = 37 months 2: < 37 months	16 21	43.24 (8.26) 56.76 (8.26)
Do you use social networks like Facebook, Myspace, or Twitter?	1: yes 0: no	Not recoded	25 12	67.57 (7.80) 32.43 (7.80)
What percentage of people do you expect to agree to linkage consent?	Continuous (0-100)	Not recoded	37	81.03 (1.85)
Would you consent to link your data in this questionnaire?	1: yes 0: no	Not recoded	28 10	73.68 (7.24) 26.32 (7.24)
How probable is it that you would link your data with your…				
…income tax return	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	11 27	28.95 (7.46) 71.05 (7.46)
…debts, credits	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	11 27	28.95 (7.46) 71.05 (7.46)
…history of working time	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	5 33	13.16 (5.56) 86.84 (5.56)
…medical data	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	16 22	42.11 (8.12) 57.90 (8.12)
…information about health insurance	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	9 29	23.68 (6.99) 76.32 (6.99)
…information about taking social service	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	8 30	21.05 (6.70) 78.95 (6.70)
…information about school records	1: very probable 2: probable 3: less probable 4: not probable	1: very probable (1) 0: not very probable (2,3,4)	8 30	21.05 (6.70) 78.95 (6.70)