

MODERNISATION OF GERMAN HOUSEHOLD SURVEYS: MODULARISATION & MIXED-MODE – FUTURE CHALLENGES

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Abstract

Household surveys in official statistics are faced with a series of social, political and methodological challenges, due to requirements on data quality and data security as well as the availability of appropriate software packages. This also applies in the case of Germany and several other European countries. Considering the methodological perspective, survey design is highly discussed by the implementation of mixed-mode data collection and the increasing demand to develop web questionnaires on one hand and the collection of data by the perspective of survey modules, rather than single surveys (modularisation) on the other hand.

Against this background, in 2012 Eurostat introduced a two-year cooperation project on European level. In that ESSnet-Project “Data Collection in Social Surveys Using Multiple Modes” (briefly: ESSnet DCSS) five member states of the European Statistical System (ESS) (Finland, the Netherlands, Great Britain, Norway and Germany) conducted methodological preparatory work regarding the design of surveys using multiple modes. Building on the results of the ESSnet DCSS and further considerations, Destatis is currently preparing a major reform on the German system of household surveys.

In this context, the paper focuses on our understanding of an upcoming modularisation in household statistics and how mixed-mode data collection is going to be supported on a methodological level as well as on the perspective of IT.

Keywords: Household surveys, Mixed-Mode, Data Collection.

1. Background: Modernisation and Modularisation of German Household Surveys

At European and national level the requirements for household surveys of official statistics are permanently increasing. Evolving user needs, respondents’ expectations as well as technical

and methodological possibilities must be arranged with additional efforts such as budget restrictions, lowering respondent burden and increasing data quality. Moreover there is a constant need to react more flexibly to changing demands resulting from new political, social and economic problems. Facing this challenge of multiple, partly opposed demands, the target for official statistics is an increased efficiency of data collection and data processing.

In order to achieve that target, Destatis is currently conducting a major reform of the system of the German household surveys in cooperation with the Statistical Offices of the Länder (regions). The project's aim is to establish a coherent and sustainable system that is tailored to suit rapidly changing user needs in data production and data information.

1.1. Status Quo

The current system of German household surveys, as those of many other European National Statistical Institutes (NSIs), is mainly based on a product stovepipe model. In that model every specific domain of statistics is an independent survey across all household statistics. Each survey corresponds to an individual production process from survey design over data collection and data processing to official publication and dissemination. Often those product stovepipes have their own data suppliers and user groups. In case of Germany the independent household surveys that are reformed are the German Labour Force Survey (LFS), which is integrated in the Microcensus, the European Union Statistics on Income and Living Conditions (EU-SILC) and the Survey on Information and Communication Technology (ICT). While the Microcensus is covering one percent of the German population with obligation to respond, EU-SILC and ICT are voluntary surveys. On a methodological base, each survey is based on an individual survey design. This means, that each survey contains its own variables, is using its own set of different survey tools (mode strategies) and has its own sample.

However, the system of mainly independent surveys certainly has some advantages. Every single production process is optimized for its final product, every domain is directly controlled by its own manager and with respect to risk-management, a problem of a single production process does not affect other statistics. Nevertheless, the disadvantages are becoming more

and more obvious. Uncoordinated statistics lead to a relatively high respondent burden, are not able to cope with phenomena of multiple dimensions and tend to be inefficient regarding the input of various resources. The switch from independent surveys towards an integrated system is necessary.

1.2. Modernisation and Modularisation

The basic idea of the future system of German household surveys leads to a new understanding of household surveys. The separated surveys mentioned above are supposed to be integrated into one survey, serving as different modules in an overall system. The overall system contains a common frame with one common sample, which is based on fully harmonised modules. In detail, harmonisation of modules is referring to a coordinated/ harmonised setting of variables between a core questionnaire (mandatory for the whole sample), which connects the other modules (partly mandatory for sub-samples) with each other. Aside from this, the future system holds a common survey administration. On the one hand, a common survey administration leads to a joint IT infrastructure and on the other hand it leads to joint data collection instruments. As a result, the future system is built upon a concurrent mixed-mode data collection design including computer-assisted personal interviewing (CAPI), computer-assisted telephone interviewing (CATI) computer-assisted web interviewing (CAWI) and self-administered paper-and-pencil data collection (PAP). Such an integrated system with harmonised modules and multiple modes is able to lower respondent burden and increase data quality through synergy effects. But simultaneously the complexity of a functional interaction is equally higher. In case of a mixed-mode data collection comprehensive survey tools need to be carefully designed on a theoretical and functional base.

2. Mixed-mode data collection in official statistics

Since quite a while, mixed-mode data collection in official statistics is of great importance for NSIs. In 2012 Eurostat introduced a two-year cooperation project on European level, the ESSnet DCSS. In a first step the project analysed the status quo of mixed-mode data collection practiced in NSIs. The results in context of the LFS 2013 offered a great diversity in mixed-

mode data collection in 37 NSIs (including three NSIs from overseas). Mainly the mixed-mode strategies relied on interviewer-assisted modes. Mixing CAPI and CATI was practiced in 11 NSIs, in a few cases the self-administered mode PAP was added to CAPI and CATI. At the time of the query only two countries realised a web-based data collection (CAWI) for the LFS (more frequently in context of the Census), even though, on a strategic base, 14 NSIs mentioned to add CAWI to their mode strategy in the next years (ESSnet DCSS, 2014a). The implementation of mixed-mode data collection with a web-based CAWI is important for nearly all NSIs and Destatis is currently in the heart of that process.

But what is the reward for implementing such a complex mixed-mode strategy? On the one hand, a mixed-mode design is able to improve data quality. By offering multiple modes to the respondents a decreasing nonresponse-bias could be a possible outcome. Especially for voluntary surveys, an additional CAWI mode could get underrepresented parts of the sample (e.g. young students) to respond. On the other hand, such an extended offer might increase the response rate in general. The chances to provide a respondent with his ideal mode are certainly higher. Furthermore, adding a relatively cheap CAWI mode to much more expensive interviewer-administrated modes (CAPI/CATI) is a way to reduce costs in order to cope with limited resources. Lastly, nowadays the majority of citizens are familiarised with handling tasks online and are accustomed to web surveys through (private) market research institutes. As a consequence, citizens expect official statistics to keep that pace by offering a comprehensive web-based mode.

Besides all those rewards, the introduction of a mixed-mode survey design may lead to mode-effects, lowering the overall data quality. Mode effects are mode-specific measurement effects which are the results of the respondent's cognitive question-answer process (Tourangeau, Rips, Rasinski, 2000).¹ Every mode is leading to a different cognitive process and likely to result in different, non-comparable responses. The challenge is to design survey tools of

¹ Differences in the cognitive process between response-modes may occur on four different stages: comprehension, retrieval, judgment, response.

different modes in a way that mode effects are minimized receiving equivalent responses over multiple modes.

To be able to identify the regulating screws in a survey design in order to minimize mode effects, it is necessary to recognize the main influence factors on response behavior. The first main influence factor is the general cognitive presentation of a survey mode. Here, you can differ between visual, auditory and combined presentation of modes. The cognitive effort for the respondent in auditory modes is much higher than in visual or even combined modes. This may lead to recency effects e.g. when responding an item with many answer options. A second influence factor is the mode specific way of using different communication channels during the question-answer process. Depending on the survey mode a respondent may use verbal (word, text), nonverbal (gestures, postures, expressions) and/ or paralinguistic (emphasis, timing, pitch) communication. For example, CAPI offers all communication channels for the interviewer and the respondent simultaneously. This may support the understanding of a complex concept but may also influence the given response in a negative way. The third influence factor refers to the type of administration of the survey itself. On one side, the administration is done by a trained interviewer (CAPI, CATI), who is able to guarantee the correct routing and is also able to probe, support and motivate the respondent. But as mentioned above, the interviewer might also influence the respondent and promote social desirability in case of sensitive questions. On the other side, CAWI and PAP are self-administered modes and, in contrast to CAPI/CATI, suitable for sensitive questions/ items but with a restricted possibility of support (De Leeuw, 2005). It is important to note that those factors cannot be treated separately. Instead the interplay of them is so complex that it is hard to generalize findings on mode effects. As a result, pure mode effects are present in mixed-mode surveys, they can be observed but at the same time they are manageable. Therefore it requires the control and test of the designs of different survey tools prior to the field work in order to set the regulating screws of the design in a way of minimizing mode effects (ESSnet DCSS, 2014b). To manage that challenge, Destatis initiated the mixed-mode project. The project is responsible for gathering all IT-requirements in the conceptual phase as well as in the phase of the production of household surveys. It is also responsible for setting up ideal

mode strategies e.g. for the first wave of a panel and in context of follow-up waves. But the main task at present – which is also the focus of the next chapter of this paper – is designing mode comprehensive survey tools.

3. Mixed-mode design at Destatis

Before designing specific mode comprehensive survey tools there is a need to set up a substantial methodology and standardization in mixed-mode data collection, which is also the base for developing guidelines for the official statistics. Therefore it is useful to reveal the two extreme approaches (in theory) for minimizing mode effects, in order to position oneself in that given spectrum. The two extreme approaches, unimode and mode-specific design, both follow the same ultimate objective: To measure the same concepts while using different modes. However, unimode and mode-specific design follow contrary approaches in designing central survey elements to attain that objective.

3.1. Unimode design

The approach of a unimode design in mixed-mode data collection is to receive an identical cognitive question-answer stimulus by designing all central survey elements like question- and answer-wording, layout and functionalities etc. in a uniform way across all modes. As a consequence one has to take all different modes into account for the final design of a survey, being limited by the least interactive/dynamic mode. When mixing PAP and CAWI, a unimode design leads to a uniform design where e.g. routing is identical (no automatic filters and a scrolling design in CAWI) and edit checks are obsolete. Nevertheless in theory even if some modes are not reaching their maximum individual potential, a unimode design might minimize mode effects by serving an identical stimulus through its uniform.

3.2. Mode-specific design

In contrast, the approach of mode-specific design tries to maximize the performance potential of each mode used in a survey in order to get the best possible data for all used modes

separately. The combined data of all modes should then lead to the smallest overall error. While the limitation of performance potential in a unimode design might lead to additional measurement errors (other than mode effects) a mode-specific design might avoid these errors. As a consequence, every question- and answer-wording, answer options, the general layout and the (interactive) functionalities etc. are separately optimized for each mode of a mixed-mode survey. For example when mixing CAPI and CATI a mode-specific design in CAPI leads to a 9-point likert scale supporting the respondent with visual show cards while in CATI branching the item into a 3-point scale with an additional detailed follow-up question (Dillman, 2007).

3.3 Tailored mixed-mode design at Destatis

On a methodological base mixed-mode at Destatis neither follows a unimode- nor a mode-specific design. An identical uniform design of modes might not necessarily lead to an identical question-answer process. There is a distinction between an offered and a perceived stimulus. Referring to the above-mentioned influence factors on response behavior, an identical set of answer options in CATI and CAWI (offered stimulus) might not lead to the same perceived stimulus since the cognitive perception differs in both modes. Likewise it is neither sensible nor feasible to word every question/ item separately for each mode since you might get a different understanding of the underlying concepts depending on the survey mode. The ultimate goal of mixed-mode data collection at Destatis is to reach cognitive equivalence in the question-answer processes across all modes (CAPI, CATI, CAWI, PAP). To get there, Destatis prefers an approach to position central elements of a questionnaire in between the spectrum of unimode- and mode-specific design. The challenge here is to identify those elements that need to depart from a unimode- to a greater mode-specific design (De Leeuw, Hox, Dillman, 2008).

The following exemplifies a few significant survey elements positioned in that spectrum to give a first glance at the mixed-mode strategy of Destatis. The question- and answer-wording as well as the question order and filter questions are key elements in a respondent's cognitive process to comprehend underlying concepts. Here, we want to get as close as possible to a

unimode design, meaning that we strive to get identical wording, question order and filter questions across all modes. Nevertheless, in reasoned exceptional cases we need to maintain the possibility to switch those unimode into mode-specific elements. That is why we now need to think our IT-requirements in many options in order to implement e.g. mode-specific question wording, even though we want to realize mode-specific wording of questions and answer options to the least extent possible. Other elements like response categories, validity checks or explanations are more likely to be designed in a mode-specific way. In CATI long lists of response categories might result in a high cognitive load for respondents. Branching those questions/items separately for CATI might be a way to support respondents to give an appropriate answer. The quantity of validity checks might also differ across the modes. While PAP is not able to serve automated validity checks at all, the number of validity checks in CAWI will be less than in CAPI and CATI. A trained interviewer is able to deal with a great number of validity checks without even letting the respondent recognize it, while a web-respondent might be annoyed having to deal with a lot of checks by himself which increases his burden and at worst leads to a unit-nonresponse. Additional explanations might also be designed in a mode-specific way since CAWI respondents usually do not read lengthy, detailed on-screen texts. Reducing explanatory texts or offering them via pop-up windows is one mode-specific solution for CAWI.

4. Prospects

Mixed-mode in German household surveys is currently a work in progress, dealing with the design of specific mode comprehensive survey tools and therefore with setting up a substantial methodology, standardization and IT-background for mixed-mode data collection. Looking forward to the phase of data-production (2020), CAPI will be the preferred mode, yet a new CAWI will be introduced and expanded over time. In long-term there could be an implementation of an additional CAWI using mobile touch devices like tablets, phablets or smartphones. Regarding mode choices there will be a possibility to choose a different mode for an entire household as well as for single individuals of a household. For implementing mixed-mode data collection, German Statistical Offices are faced with complex preconditions

that make it tough to create efficient, coherent surveys while concurrently respect all standards of data-protection law.

In general the modernisation of German household surveys, which are leading to a modularised system with a mixed-mode data collection, is a major challenge. Bringing together content-related, methodological and technical demands for implementing the described integrated system is a current and also future task. Nevertheless it promises a lot of synergy effects that help to save resources, lower respondent burden and guarantee the flexibility to react to changing demands.

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