

Web Survey Methodology

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Broader context of web surveys

In previous chapters we focused on the essential methodological aspects of the core web survey process (Chapters 2, 3, 4) and on related implementations (Chapter 5), while in this chapter we will discuss the broader methodological (Section 6.1), managerial (Section 6.2) and professional (Section 6.3) contexts, which are all very important for understanding and managing the process of web surveys. We also overview the web survey bibliography (Section 6.4).

6.1 BROADER METHODOLOGICAL CONTEXT

We first address aspects that have considerable indirect methodological relevance for web surveys and provide a closer look at the definition of the web survey mode (Section 6.1.1), data quality (Section 6.1.2), web survey mode effect (Section 6.1.3) and costs (Section 6.1.4). In addition, we review the related activities that extend beyond the core web survey process (Section 6.1.5): the steps of preliminary research activities and advanced analysis, processing and valorization, as well as mixed-modes and mixed methods. We conclude with a discussion on adaptive, responsive and interactive designs (Section 6.1.6).

6.1.1 Web Survey Mode Revised

Our initial definition (Section 1.1.1) of the basic web survey mode served as an introduction to this mode, but now we can outline it more precisely. Firstly, let us say again that we conceptualized the survey mode as being entirely separate from the sampling and also from the recruitment process. When we defined it, we thus considered only factors with a direct impact on the measurement stage, where respondents fill in the questionnaire.

The literature typically defines the survey mode with certain attributes (dimensions, factors, characteristics) that are related to the

features and procedures of the measurement stage. These attributes define the basic mechanisms of communication, including information transfer between the respondent and questionnaire. While different authors (Biemer & Lyberg, 2003; Couper, 2011; Groves et al., 2009; Tourangeau & Bradburn, 2010) identified different dimensions of the survey mode, recently Berzelak (2014) defined the survey mode by six *inherent mode characteristics*. These are the characteristics that are all under a researcher's control, are stable across actual survey implementation and have an impact on the response process. We briefly outline them below, building on our discussions in Chapter 1, together with their options, where we underline those that relate to the basic web survey mode:

- a *Interviewer involvement*: interviewer administered, self-administered without the presence of an interviewer, self-administered with the passive presence of an interviewer (e.g. CASI, see Section 1.3.4).
- b *Usage of computer technology*: interactive computerized questionnaire, non-interactive computerized questionnaire, P&P recording (see Section 1.1 and Section 1.3.2).
- c *Information transmission medium* (i.e. delivery of the completed questionnaire from the respondent to a researcher): F2F, telephone, mail, email attachment, email embed, automatic online delivery (e.g. via the Internet or some other electronic network, see Section 1.3.1).
- d *Question presentation input channel*: auditory, visual, both (see Section 1.3.4 and Section 1.1).
- e *Response output channel*: oral, manual handwriting, manual electronic (mouse, keyboard, pointer, stylus, touch screen) (see Section 1.3.4 and Section 1.1).
- f *Closeness of the interviewer interaction*: physical, remote audio or video, pre-recorded audio or video, virtual audio or video (e.g. virtual interviewer), no interaction.

Moreover, there are also other survey mode characteristics, related to various *implementation and contextual specifics*, which are mostly out of a researcher's control and vary across implementations, interviewers and respondents. As such they do not define the survey mode, but

rather the specific implementations in a particular survey. Examples include the pace of the interview, cognitive requirements, technology (e.g. device type, screen resolution, sound quality, etc.), environmental distractions, multitasking of respondents, sense of impersonality, and characteristics of the interviewer and the respondent. Implementations may also differ across various other technical aspects, which often have no or negligible impact on the survey process, such as the location of the server (e.g. SaaS), web survey software, as well as client-side (e.g. surveys run as mobile applications) vs server-based surveys. Correspondingly, the use of smartphones and tablets for answering web questionnaires does not introduce a new survey mode, and when a respondent is using a desktop/notebook, tablet or smartphone to answer the web questionnaire, we still speak about the web survey mode. This does not mean that the mobile device does not cause any specific device effects (see Section 5.1.3), or that we do not need to consider also the case of intentional device-specific web survey implementations (e.g. online panels using mobile survey applications). The six dimensions define hundreds of different survey modes. The underlined options in (a)–(f) above specify a survey mode, which has the characteristics of the basic web survey mode, but in fact relates to a broader family of *basic* online CSAQ (which we introduced in Section 1.3.2) survey modes, where the input (d) is restricted to the visual option and the output (e) to a manual electronic output. Within this context, the basic web survey mode is only a specific subtype of basic online CSAQ, with the following three sub-characteristics: the online transmission medium (c) is the Internet; server-based communication is used for interaction; and the interface is based on web browsers. Thus, the basic web survey mode excludes surveys which run within mobile applications, independent of browsers and the interaction with the server (see Section 5.1.5).

When we remove the restrictions for input (d) and output (e) channels, the remaining four

inherent mode characteristics – self-administration (a), interactive computerization (b), online delivery of responses (c) and absence of interviewer interaction (f) – define an even broader family of *online CSAQ* survey modes, where voice technologies are also involved. When the web is used specifically as the transmission medium for the automatic online delivery of responses, then we speak about the *web-related survey modes*. This is the case with some mobile survey applications, where the web serves only for receiving the questionnaire and sending it back to the server.

The above clarifications demonstrate the large variety of possible modes and show that the case of the basic web survey mode is in fact only a very specific example. Nonetheless, it bears repeating that the vast majority of contemporary web-related surveys are conducted with this mode. More detailed elaboration, examples and graphical presentations of survey modes can be found in the Supplement to Chapter 6, *Survey modes* (<http://websm.org/ch6>).

6.1.2 Total Survey Error and Survey Data Quality

The notion of *total survey error* (TSE) is an umbrella term covering all types of survey errors. Certain classification and terminological differences exist with respect to the treatment of TSE by various authors, as discussed in Groves & Lyberg (2010), and continuous revisions also appear, for example Smith (2011) provided a much elaborated typology of TSE components. Nevertheless, the following components of survey errors are most often exposed: sampling, coverage (frame), nonresponse, specification, measurement and processing (Biemer & Lyberg, 2003). Each type of error can have systematic and random components, expressed as bias and variance respectively. The TSE is defined and conceptually elaborated on only within a probability sampling context; however, in practice the approximations are also used, as outlined in Section 2.2 on sampling.

The *mode effect* is a specific subtype of measurement error and also a subcomponent of the TSE. It appears as a result of the influence of survey mode on estimates. The corresponding differences in response distributions are caused by inherent characteristics of the specific mode. They are obtained when administering the same question in different survey modes (e.g. F2F vs the web). Biemer & Lyberg (2003) used the more precise term *pure mode effect* to contrast a broader notion of the *mode system effect*, which also includes other related error sources potentially accompanying certain survey modes (e.g. sampling, nonresponse, recruitment, incentives, research design context). For example, these mode system effects refer to situations when a specific survey mode is not assigned to the units randomly, but is chosen by respondents through an unknown selection mechanism, which is then difficult to separate from the pure mode effect.

Each component of the TSE can damage the statistical quality of the estimates used to infer the population parameter. Most frequent indicators of these deviations are related to sampling precision (random oscillations, expressed with sampling variance), bias (difference between the true population value and the expected value of the estimate), reliability (consistency of responses in repeated measures) and validity (degree to which we actually measure the concept we truly wanted to measure).

Very often we also use the notion of *accuracy*, expressed by the *mean squared error* (MSE), which estimates various components of the TSE (Dietrich, 2008). The MSE is the sum of random variances and squared biases of the related components included in the TSE. However, it is difficult to deal with the random and systematic errors of all TSE components. In practice the discussion is most often reduced to the sampling variance and the biases arising from nonresponse or non-coverage. Minimizing the MSE can justify the use of web surveys which can afford inexpensive larger samples,

and where smaller sampling variance then outbalances the potential bias, which often appears in web surveys due to higher nonresponse and/or non-coverage.

While survey errors integrated into the TSE relate to the statistical characteristics of the estimates (e.g. accuracy), the notion of *survey quality* is much broader (Lyberg, 2012). It includes additional aspects of survey outcomes (statistical results), such as *relevance, comparability, coherence, timeliness, accessibility* and *clarity*. An even broader framework of data quality involves trust and the *perception of the users*, as well as the characteristics of the related *production process* (Ehling & Körner, 2007). Similar processing components are included in the ISO (2012) standard on the survey process. Various general quality management approaches can also be applied here, such as Six Sigma statistical process control and total quality management (TQM). Dedicated survey data organizations (e.g. statistics offices) typically develop their own – often very elaborate – systems to monitor the data quality via standardized quality reports (e.g. Eurostat, 2009). Nevertheless, the specific mode effects are a component of these general systems on which rather little and weak elaboration is available in the literature, though we believe this will change with the increased usage of mixed-mode surveys.

Particularly for large and complex surveys as well as for decision support surveys, these broader survey quality aspects are very important. For example, a failure to deliver the results at a certain time (e.g. at a decision point) means the entire survey was useless, regardless of its accuracy and otherwise high quality. Researchers with a very narrow focus on the methodological details of the web data collection process may sometimes overlook these additional and very important components of data quality, and consequently forget to look at the big picture. Thus, it is advisable to include aspects of data quality explicitly in the conceptualization, operationalization and planning of web surveys, as well as in the regular managerial monitoring of the process.

6.1.3 Evaluation of the Web Survey Mode Effect

The complexities of the survey mode and its interaction with other types of survey errors make the empirical evaluation of mode effects very demanding. As a consequence, there are numerous studies in which we cannot truly isolate the pure mode effect. The mode effect can also be contaminated with a poorly designed questionnaire (e.g. incorrect scale format, excessive colours or pictures, etc.), respondent failures (e.g. low computer literacy), technical problems (e.g. device failure) and other mistakes in the web survey implementation. Most importantly, pure mode effects often interact with nonresponse, non-coverage and sample selection mechanisms, which are then very difficult to separate.

When comparing survey modes, one mode is usually declared (or implicitly assumed) to be the accurate one (i.e. the gold standard). Very often this is F2F. We need to be very careful about such situations and rather speak about the *between-mode effect* or, better, *between-mode difference*, unless we know the true value of the responses (e.g. via auxiliary data). The between-mode differences are usually observed as simple differences of estimates of means among alternative implementations, such as experimental groups. Further, mode effect studies can also focus on correlations or measurement equivalence (Revilla, 2013), reliability (Buchanan & Smith, 1999; Chang & Krosnick, 2009; Hertel et al., 2002; Mangunkusumo et al., 2006; Miller et al., 2002), latent structures (Buchanan & Smith, 1999; Deutskens et al., 2004; Roster et al., 2004) and so-called concurrent validities (Linchiat Chang & Krosnick, 2009; Hertel et al., 2002).

A typical example of a study comparing survey modes, but not isolating the pure mode effect, is the Spijkerman, Knibbe, Knoops, Mheen, & Eijnden (2009) study comparing results from a non-probability online panel ($n = 57,125$) with a probability F2F survey

(CAPI, $n = 7,204$) of the Dutch general population. They found considerably higher drug usage in the online panel (e.g. 39% vs 28% for ever using cannabis in the age group 15–24). However, it is unclear whether these differences come from the mode (respondents admit more drug use in the web vs F2F survey mode) or from differences with respect to nonresponse, self-selection, sampling, non-coverage or different populations involved. The mode effect in many studies is often confounded by frame problems (Burr, Levin, & Becher, 2001; Tomsic, Hendel, & Matross, 2000), different samples (e.g. Braunsberger, Wybenga, & Gates, 2007; Chang & Krosnick, 2009; Roster et al., 2004), the availability of email addresses (Deutskens, de Ruyter, & Wetzels, 2006; Griffis, Goldsby, & Cooper, 2003), and sequential mixed-mode designs for nonresponse reduction (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003). These uncontrolled differences can be wrongly attributed to pure mode effects.

A standard approach towards isolating the pure mode effect is to use experiments and randomly assign units to subsamples with different implemented modes. Nevertheless, nonresponse and considerable random errors still cannot be separated from the mode effect (Vannieuwenhuyze & Loosveldt, 2013). Population weighting might help, but only to a limited extent which is usually unknown (see Section 4.1.4). Some specific approaches (Vannieuwenhuyze, Loosveldt, & Molenberghs, 2010, 2012) which use single mode groups within the mixed-mode context may partially reduce this problem.

An even better research design is randomization in a laboratory, where the participants are randomly assigned to experimental groups only after arrival at the laboratory, as in Chang & Krosnick (2010). Similarly, Jäckle, Roberts, & Lynn (2006) reported an experiment where participants were recruited on the street and, after they agreed to cooperate, they were randomly assigned to one of four modes. With this approach we can additionally eliminate the potential differences in nonresponse.

However, external validity issues arise; that is, whether the findings in artificial (laboratory) experimental conditions also hold in real-life conditions.

An alternative approach to measuring the pure survey mode effect is *re-surveying* (test–retest or repeated measurement), which can effectively control for sample, coverage and nonresponse differences between groups. In addition, this sharply reduces the sampling variance, because we measure the same units in both waves, and dramatically increases the power of discovering potential differences (e.g. Alwin, 2007). However, practical implementation is complicated and expensive, as we can infer from the limited number of studies with this implementation (Mangunkusumo et al., 2006; E. T. Miller et al., 2002; Rivara, Koepsell, Wang, Durbin, Jaffe, Vavilala, ... Temkin, 2011). In addition, respondents may remember the same question from the first wave and some external effects/events between the two measurements may change the value of the target variable. To control for these, another experimental group would be needed (i.e. an ‘after’ control group without treatment of the first wave). An additional problem may arise due to the effect of the order in which survey modes are applied; to control properly for it, yet another experimental group would be needed with the opposite order of treatments.

Many studies demonstrate that the web survey mode is usually superior, or at least equivalent to conventional interviewer-administered (F2F, telephone) and also to P&P self-administered modes (e.g. Börkan, 2010; Braunsberger et al., 2007; Buchanan & Smith, 1999; Chang & Krosnick, 2009; Hertel et al., 2002; Mangunkusumo et al., 2006; Roster et al., 2004). More specifically, a meta-study by Tourangeau, Conrad & Couper (2013) showed that with respect to sensitive behaviour, which is usually under-reported in traditional survey modes, respondents tend to answer more realistically in web surveys, where no interviewer is present. We have already asserted (Section 1.3.5) that self-administration is advantageous for other reasons (e.g. respondents select their own time and pace when filling in the questionnaire).

On the other hand, specific web survey mode effects may sometimes appear in the negative direction, predominantly due to various forms of shortcutting: satisficing, excessive item non-response (or don’t know) selection, speeding, inconsistent responses, etc. Most often this is a consequence of the absence of the interviewer, whose presence is sometimes indispensable for motivation (e.g. long surveys) and clarification (e.g. complicated questions). Nevertheless, a careful combination of incentives and interactive questionnaire design may compensate for the absence of the interviewer to a considerable extent.

6.1.4 Cost-Error Optimization

When discussing differences in survey modes and survey data quality in general, cost aspects are very often omitted. The question of whether it is accurate and fair to compare the web survey mode to the alternatives without controlling for costs then arises. That is, only comparisons under a fixed budget – and not under the usual practice of fixed sample sizes (e.g. $n = 1,000$ for each mode) – would possibly show that web surveys allow us to afford much larger sample sizes. Alternatively, the comparative savings from web surveys may be invested in incentives, mixed-modes and other improvements, which can substantially increase data quality and change the results of comparisons. The absence of cost considerations in the literature is even more surprising, because the cost is very often the most essential factor when we decide on which survey mode to use.

We have already mentioned certain specifics (Section 1.3.5) of fixed costs in web surveys, which are often relatively independent of sample size, while variable costs per unit are comparatively low and depend on sample size. The computation of *total costs per minute* of respondent time is a great tool to compare web surveys with traditional alternatives. For example, general population probability-based F2F surveys, such as general social surveys, have typical per minute costs of a few euros/dollars

in developed countries, sometimes even above 5 or 10, while probability online panels often have total per minute costs roughly in the interval of 1–2 euros/dollars. Web survey responses from non-probability samples can have much lower costs per minute, which strongly varies, depending on the quality. The costs need to be balanced with data quality, which is a very complex problem, and can be additionally complicated when modes are mixed. Conceptually, these issues were addressed relatively early (e.g. Groves, 1989), but in practice we still lack effective operational criteria and procedures. An approach to optimizing cost and accuracy simultaneously – which means minimizing the product of costs and MSE – has been discussed by Vehovar et al. (2010). A specific approach was presented by Roberts, Vandenplas, & Stähli (2014) and Vannieuwenhuyze (2014), while Schouten, Calinescu, & Luiten (2013) discussed cost optimization within the context of responsive design, where cost-error optimization directly affects sequential fieldwork procedures.

6.1.5 Beyond the Core Web Survey Process

So far we have observed the core web survey process as being entirely isolated and within a simplified flow of pre-fielding, fielding and post-fielding. In reality this is rarely the case – web surveys are usually more complicated and nested in the larger research context, so we review a few of the most essential aspects below.

6.1.5.1 The Step of Preliminary Research Activities

We defined preliminary research activities in Section 1.2 (Figure 1.1) as preceding the core web survey process. What separates them from pre-fielding is that they are not directly related or involved in the specifics of web surveys. Instead, they are concerned with general preparations, which are independent of any survey mode. Nevertheless, they can be very important for the entire context of web surveys. These preliminary research activities typically – but now always – include the

following components, which we present in a simple, unstructured and non-exhaustive list:

- clarifications of general issues, such as initial research ideas, the broader (research, business, administrative) framework, basic paradigmatic and conceptual settings, problem formulation, goal identification and research problem definition, together with elaboration of the relation between the research problem (e.g. how to measure customer satisfaction) and the eventual decision problem (e.g. how to increase customer satisfaction);
- further elaboration of research design aspects, such as a more specific outline of the key concepts, operationalization of the constructs, development of research hypotheses, specification of research methods used, definition of the target population and sometimes the selection or elaboration of key questions;
- ethical considerations, which can also involve the potential formal approval process;
- key administrative, management and process quality issues, including essential aspects of timing, costs and other resources;
- in the case of complex research designs, certain forms of preliminary research activities are conducted here, particularly desk (secondary) research, qualitative studies and expert consultations;
- additional activities appear whenever the role of a researcher – whom we have treated so far as one entity – is split across the sponsor, the client, research provider, the software supplier, etc. (see Section 1.2), which then greatly complicates the preliminary research activities and requires additional actions, interactions and processes.

Although not all of the above activities appear in every survey, the majority of them do, at least in some unstructured and informal way. Even in simple DIY research, certain decisions and activities are needed for the majority of these issues to find corresponding solutions. In more complex research projects, the methodological aspects are usually elaborated in a formal *research design*, which specifies the research methods used, together with the stages, sequence and other specifics of the related research activities. In general, various qualitative and quantitative

research methods can be involved, according to the exploratory, descriptive or causal nature of research. The role of the web survey needs to be determined within the general research design. Of course, some of the above preliminary research activities can overlap with pre-fielding to a certain extent, particularly the early elaboration of methodology (e.g. the questionnaire is already predetermined by the client).

Another type of formalization relates to a *research proposal*, which outlines all essential aspects of the proposed research, not just the methodological aspects. Examples of good practical elaborations can be found in the book by Iacobucci & Churchill (2015). Very often this proposal then undergoes a certain approval process from management, client, sponsor or other funding body.

A research proposal is particularly relevant in situations where the role of the research is split among various entities and their relationships need to be specified. In this context, various forms of tenders or research grant calls are very frequently involved, requiring additional and careful administrative elaboration (application forms, specification of processes, legal aspects, selection process and criteria). In addition to the price, quality indicators of the web survey process (e.g. response rate) should play a decisive role whenever a web survey is involved.

Since preliminary research activities are typically very complex, structured and survey specific, the literature rarely discusses them as one entity. Instead, various components or aspects are discussed separately (e.g. research paradigms, research methods, procurement procedures, legal aspects). For a more informed view of the methodological aspects of preliminary research activities, the reader can consult the general literature on survey methodology (e.g. Blair, Czaja & Blair 2014; Groves et al., 2009), social science methodology (e.g. Babbie, 2013) or discipline-specific literature (e.g. for marketing research; Iacobucci & Churchill, 2015). Other aspects are rarely elaborated specifically for survey contexts. Exceptions are the publications by Iacobucci & Churchill (2015), Iarossi (2006),

and Sue & Ritter (2012), which do provide some insight into the specifics of the tendering process.

6.1.5.2 The Step of Advanced Analysis, Processing and Valorization

We have already defined this step in Section 1.2 (Figure 1.1) as the one belonging to broad research activities, not directly related to the specifics of web surveys. Its activities thus follow the core web survey process and we also specified the corresponding separation from the post-fielding step in Chapter 4.

The corresponding activities predominantly relate to advanced *analyses*, which include reporting, statistical procedures, variance estimation, substantive interpretations and the preparation of reports and presentations.

This step also includes various advanced forms of post-survey *data processing*, such as integration into certain management and decision-making procedures within broader administrative or business processes. Survey data can be subject to further manipulations, from data merging, record linking, statistical matching (i.e. data fusion) and several other uses. These manipulations are increasingly becoming an important element in advanced research and administrative or business processes.

The valorization component includes further exploitation of results (usage and reuse in other research or decision processes) and dissemination of results by public archiving of the datafile and by distribution, promotion and publication of the findings (in newsletters, briefs, documentation, full reports, as well as in papers and books).

6.1.5.3 Mixed-modes

We introduced the notion of mixed-modes in Section 2.1 as a combination of survey modes in the measurement stage, and we used the term mixed-mode system to also encompass multi-mode contacts in the recruiting stage, as well as other aspects and consequences of using more communication channels in the fielding step.

In addition to this, we address certain broader implementation aspects.

Firstly, note that, with business surveys, the web survey mode and the P&P (or telephone) survey mode are often routinely combined, typically in a standard sequential manner, proceeding from the inexpensive (web) mode to the more expensive (mail, telephone) one.

Secondly, we should point out that, despite various claims and indices of the growing use of mixed-modes – understood as a combination of survey modes in the measurement stage – this in general is not the case, at least for marketing research and for the DIY segment. In marketing research (Macer & Wilson, 2013, p. 40), mixed-mode surveys have a relatively low share of revenue (6% for mixed-mode compared with 52% for web surveys). In addition, the share has already been very stable for the last seven years and no future increase is foreseen. This is not surprising, since high-quality mixed-modes are complicated and typically very expensive, compared with the stand-alone alternatives of web, mail or telephone surveys, which currently dominate in the field of marketing research.

The situation is different with expensive probability-based F2F household surveys. Here, due to problems related to sampling, recruiting, non-coverage and nonresponse, web surveys cannot simply replace traditional surveys modes, but can enter into the survey process through mixed-modes. However, as discussed in Section 2.1, this is methodologically complicated. Nevertheless, it seems that – after initial implementations (e.g. Beukenhorst & Wetzels, 2009) – mixed-modes involving a web survey mode are slowly becoming mainstream in these types of surveys (Buelens & van den Brakel, 2014).

An important mixed-mode challenge in official statistics relates to the Labour Force Survey, where continuous progress can be observed in terms of introducing web surveys as a mode of data collection, as in Körner & van der Valk (2011) or the DCSS project (Blanke & Luiten, 2014).

In academic surveys we can also observe progress in considering mixed-mode data collection, but with a high degree of caution, as shown in the

ESS mixed-mode experiment in Estonia (Ainsaar et al., 2013) and the UK (Villar, 2013).

Let us present a typical example which illustrates well the problems with mixed-modes. A recent tobacco, alcohol and drug survey (average length 40 minutes) from the Slovenian Institute of Health¹ used a standard sequential mixed-mode survey approach (web → telephone → F2F) and obtained a cumulative response rate of 20% after the web, 45% after the telephone and 60% after the F2F wave. Response rates and cost savings were a big success compared with the standard alternative of F2F as well as the inclusion of segments which would not cooperate in traditional survey modes. However, mode effects remained unclear. For example, cannabis consumption (ever using cannabis) – after weighting for socio-demographic population for each mode segment – was 25%, 10% and 9% for the web, telephone and F2F mode segments respectively. The problem is that it is now impossible to isolate mode effects from selection (wave) of the mode, differential nonresponse bias, stage of survey process and differences in survey population. The future impact of the increasing percentage of responses collected via web surveys on trends is thus unclear. If the estimates of cannabis consumption increase, we might not know whether this is because people truly consume more, or only because more and more people respond on the web, where they may admit more consumption.

A possible solution to this problem would require parallel experiments where units would be surveyed only F2F, so that pure mode and between-mode effects could be estimated. Alternatively, re-interviewing the units with a different survey mode can be used. These approaches were studied in experiments run by Klausch, Hox, & Schouten (2014), where various mode effects were then isolated. A possible solution is also the involvement of advanced weighting approaches (Buelens & van den Brakel, 2014). It seems that we need to use both approaches, the involvement of some modelling assumptions based on external estimates (e.g. obtained by reinterviewing) of mode effects and also advanced weighting.

6.1.5.4 Mixed Methods

Mixed methods refer to the research design where we combine quantitative methods of primary data collection (e.g. surveys) with certain qualitative methods of primary data collection (e.g. in-depth interviews, focus groups, expert interpretations, story-telling, action research, ethnography and brainstorming). As with surveys, qualitative research techniques are increasingly moving to the web (e.g. online in-depth interviews (via chat) or online focus groups).

There exist extensive paradigmatic, conceptual and operational discussions about these issues, and sometimes mixed methods even stand as the third research paradigm, in addition to qualitative and quantitative research (Johnston, 2007). In recent years we can also observe an expansion of mixed methods in the literature and in practice (Morgan, 2013).

We should add that within the web survey process researchers already rely on qualitative insights for various methodological reasons when formulating a problem, developing a questionnaire or evaluating survey questions. For the substantive aspects researchers typically involve qualitative research in the interpretations, using expert evaluation or qualitative feedback from the target population.

The web is extremely suitable for the combination of approaches. With traditional survey modes, the combination of methods beyond two steps (e.g. focus group → survey) very often requires a lot of time and resources. In contrast, the web enables easy, inexpensive and rapid mixing of qualitative and quantitative methods. Lobe & Vehovar (2009) showed that sequences of qualitative (online chat) and quantitative (web survey) methods can iteratively sharpen the depth and quality of the research and can provide a comparable advantage: four steps (qualitative → quantitative → qualitative → quantitative) may thus outperform one step (either qualitative or quantitative) and also more standard two- (qualitative → quantitative) or three-step (qualitative → quantitative → qualitative) research designs within the resources provided.

Mixed methods are particularly convenient within the context of so-called crowdsourcing and various other approaches in online community studies, where corporations and marketing research companies establish and maintain an online community of the target population for their qualitative and quantitative data collection.

6.1.6 Towards Interactive Fieldwork Design

According to the initial scope of discussions (Section 1.2), we predominantly discussed cross-sectional web surveys in previous chapters, relying on a single measurement session. The fieldwork process is relatively simple in such situations, particularly when we have list-based web surveys, using an email invitation and a reminder that is sent to all units.

On the other hand, complexities can arise from more sophisticated designs. Survey data can be collected in a series of replications of an identical survey on independent samples, but also with sequences of complementary surveys on independent samples, and of course in various types of longitudinal designs. In addition, different external data can be iteratively incorporated into the web survey process, namely administrative (e.g. using a certain form or enquiry of a citizen), business (e.g. commercial transactions of consumers) or technical (e.g. log file information of certain actions performed by the user on the web).

Another level of complexity appears when a mixed-mode system is involved and particularly when various interactive fieldwork strategies replace more or less fixed recruitment plans with limited implementation variations, as discussed in the recruitment stage (Section 3.1).

Adaptive design (Schouten et al., 2013) builds on the fact that survey fieldwork in general faces many uncertainties, which could be reduced by using the data from the fieldwork itself. That is, very often all units in the sample receive the same *treatment*, which means the same number of reminders, the same modes of invitation and the same survey measurement mode. Certain auxiliary data (such as age, region, cost structure,

estimates of response rates) are used to structure and optimize the sampling or the research design (e.g. stratification, multi-stage sampling, double sampling, repeated survey, mixed-modes). However, this is done in advance and does not incorporate feedback from the fieldwork.

Adaptive design is often discussed within the narrower context of *responsive design* (Groves & Heeringa, 2006), which additionally requires that the survey is structured in phases, where data from the previous phase are then used to improve the next phase (e.g. Wagner, West, Kirgis, Lepkowski, Axinn & Kruger-Ndiaye, 2012). Typically, certain subgroups may report low response rates, so with responsive design additional resources (e.g. more contact) are allocated in the next phase.

It is surprising that adaptive and responsive designs are mostly discussed with F2F or telephone surveys (Schouten et al., 2013), while implementations with web surveys are rather rare, despite the fact that rich paradata, flexibility, ICT support and elaborate monitoring actually provide a much more convenient setting (Bianchi & Biffignandi, 2014).

We extend here the notion of adaptive design to even more general *interactive fieldwork design*, which means any usage of data generated during (a) fieldwork at the (b) unit level – namely, survey data, paradata and external data (technical, administrative, business) – to improve the (c) real-time optimization of the fieldwork procedures related to the recruitment and measurement stages.

The line between implementation variability adaptations discussed in Section 3.1 and interactive fieldwork design can sometimes be very thin, as, for example, in the case where we pre-specified the exact criteria in the recruitment plan, when low response rates would require activation of a supplementary sample, sending additional reminders or launching an additional promotion. The main distinction is that interactive design also includes interventions at the unit level, not just at the level of segments. For example, it is not that a mail reminder is simply sent to all nonrespondents who have already received three email invitations, but that additional information at unit level is used to treat each unit separately and decide specific actions at that level.

Figure 6.1, updated from Vehovar & Batagelj (1996), conceptualizes the potential processes in interactive fieldwork design within the mixed-mode setting. The flow refers to information and data communication processes at the unit level, which is different from the conceptualization of the general web survey process in Figure 1.1 (Section 1.2). The centralized processing and monitoring interactively links the two essential fieldwork activities: recruitment and measurement (i.e. questionnaire completion). Different survey modes can be used to recruit respondents (i.e. multimode contacting) and contact attempts can be repeated until it is decided that a response is not possible (e.g. we learn that the unit is ineligible), the fieldwork time has finished, or it is not reasonable to try any further to contact a certain unit. The decision on the latter can depend on simple rules (e.g. a maximum of five contact attempts), on the nonresponse context (e.g. minimal response rate or minimal number of responses in a certain segment), on statistical parameters (e.g. required precision of certain estimates) or on certain complex cost-error criteria, which optimize the data quality by cost (e.g. product of costs and MSE).

Different decisions can be applied to different units in order to optimize timing, costs and data quality. For example, if there were units with no response after two email invitations, intelligent centralized processing – which disposes with all auxiliary information about the unit (e.g. age, gender) and also all fieldwork data, paradata and external data – might automatically decide, based on some optimizing algorithm, on the optimal timing, mode and format for the next contact attempt. It might be optimal to send the next email reminder in a week or two, or rather to send a mail reminder. Similarly, the most appropriate survey mode can be a P&P questionnaire instead of a web questionnaire.

The centralized ICT-supported processing can strongly improve integration, interactivity and optimization, particularly because it can incorporate experiences from past surveys and involve statistical and decision models. We may further optimize the structure of the measurement session at the unit level, which can be split into more sessions.

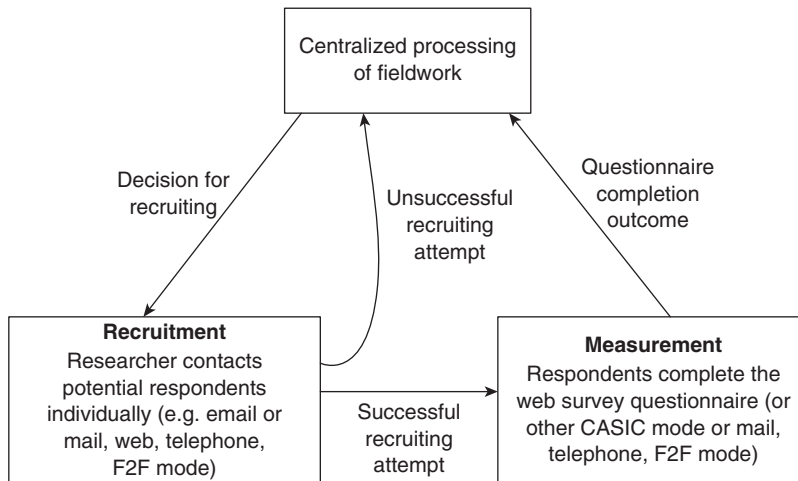


Figure 6.1 Unit-level processes within an interactive mixed-mode fieldwork design for list-based samples

In the above discussion and in Figure 6.1, we have talked about list-based web surveys, but in the case of non-list-based web surveys, this would change slightly: instead of direct individual invitations, a researcher interacts with the units using variations in the promotion strategy (e.g. banner ads), so the focus of interaction would be on modifying the online recruitment efforts (Section 2.2.3). For example, a researcher can decide to decrease direct banner advertising and increase promotion in online social media.

Interactive framework designs need to be considered in pre-fielding and can complement or replace the recruitment plan, where we additionally extend the set of design features related to timing, costs and data quality, as well as the set of monitoring indicators, which then point to situations requiring action or modification. As mentioned previously, real-time calculations can be integrated and expanded with intelligent ICT support.

Some aspects of the general optimization in a mixed-mode setting can be found in the literature (e.g. Schouten et al., 2013; Vannieuwenhuyze, 2014; Vehovar et al., 2010). Of course, the iterative fieldwork design can be further expanded beyond the involvement of mixed-modes by the incorporation of mixed methods and with the interaction of external administrative, business and/or technical processes.

6.2 WEB SURVEYS WITHIN THE PROJECT MANAGEMENT FRAMEWORK

In Section 2.6 we addressed management aspects that were specific to the core web survey process, while in this section we discuss the broader context of project management.

Web surveys can be treated as any other project, where general project management principles apply: a researcher needs to organize, plan and coordinate various activities to reach the goals within certain time and resource constraints. Professional project management standards were developed for these types of tasks and work, particularly when it is done once, for the first time, or repeated with different content.

Project management helps formalize the elaboration of *description of work* (DoW), structuring of the tasks and activities into *work packages* (WP) and the optimal allocation of resources. It also deals with planning and timing, including the specification of milestones (i.e. key dates) and *deliverables*, which is the term that denotes reports, results and other measurable outputs of the project in the project management context. The provision of control is also very important here, as well as supervision, coordination and interventions.

A researcher needs to coordinate many activities during the web survey project. We can deduce from the structure of the web survey process, illustrated in Figure 1.1 (Section 1.2), that the activities of all 12 stages interact among themselves. These stages can also be directly transformed into the structure of work packages within the project management plan. Considerable complexity arises already within the questionnaire preparation process (Figure 2.1 in Section 2.3.6), where testing and questionnaire development are linked to a complex management process. Additional complications come from preliminary research activities and other interactions with the environment that is external to the core web survey process.

Thus, there is a lot to plan, a lot to coordinate and also a lot that could go wrong. The managerial skills required can easily become equally important – or even more important – than the methodological skills for the successful running of web surveys. We can illustrate the project management tasks with a few examples related to levels of complexity:

- In a post-event evaluation survey – where we seek feedback from participants whose emails we are also disposing of – project management can be a straightforward sequence of preparing the questionnaire, arranging emails, sending invitations plus a reminder and then generating a preliminary report, which is disseminated online. All this may take only a few minutes for an experienced researcher with suitable software and with a standardized questionnaire at hand.
- In the above case, if we add new questions, which need to be developed and pre-tested, this involves more activities, so the entire project may require a few hours of a researcher's time. In any case, this example fully demonstrates the power of web surveys: namely, the extreme speed and convenience, especially if respondents reply immediately via a mobile device. The time and cost efficiency cannot be compared with any traditional survey mode alternative.
- Things get more complicated when we conduct a survey for a client or when the

complexity of the web survey requires a project team, where additional interactions, communications and complications arise. A typical web survey project, which includes certain substantive preliminary investigations, implementation of the web survey and a final report, may already require a small team and a few hundred hours spanning a few weeks or months. All of this perhaps also requires formalized project management tasks, at least at a minimal level.

- With growing complexity the resources required for project management typically expand rapidly, while at the same time the core web survey process itself often takes up an increasingly smaller part. Running web surveys with budgets approaching or exceeding six digits (e.g. \$100,000) is already a serious enterprise which requires formalized project management.
- With online panels, longitudinal studies, research conducted across many countries and research where partners from different organizations and sectors are involved, the importance of project management increases additionally. Within international research, the translation and back-translation alone is already a serious project management challenge.

Professional data collection organizations, regardless of the sector (commercial or public), typically have their own elaboration of project management rules. On the other hand, organizations not dedicated to survey data collection, particularly in the academic and non-profit sector, are also involved in conducting web surveys, and sometimes their researchers are not prepared for the management of complex web survey projects because management issues cannot be dealt with using only general knowledge and common sense. Below we outline typical project management issues that can cause problems when they are treated with insufficient resources and attention:

- Adequate format of project team meetings (i.e. structure, length, frequency), together with strict recording of minutes, their monitoring and reporting.

- Clear (i.e. written) separation of responsibilities among team members and the client, including the communication strategy (e.g. can the client talk directly to the web programmer?).
- Quality assurance criteria and corresponding evaluation procedures, which need to be formalized in advance in a stand-alone document, and where it is also useful to involve external expert monitoring or a steering committee, which regularly oversees the project (this is particularly relevant for new, lengthy or complex projects).
- Elaboration in advance of the essential management procedures, together with initial planning, contingency plans, risk management, crisis management and conflict resolution schemes.
- Formalized monitoring of the core web survey process, especially fielding (e.g. response rates, data quality).
- Regular control of resources, including hours spent, and monitoring of the timing via milestones, deadlines, critical paths and Gantt charts, which is a standard monitoring approach in project management.
- Platform for documenting, backing up, archiving and communication, which preferably goes beyond email attachments and enables online access to the most recent material (e.g. draft questionnaire).
- Clear regulation (e.g. contracts) regarding ownership of the data, intellectual property rights, and penalty clauses in the case of delays or mistakes in data collection.

All of the above hold true for any survey research project, while with web surveys there are many additional opportunities to shorten, simplify and optimize management tasks by using integrated web survey software and other online services.

The essential professional resources are related to specific management approaches where standards and certificates are also elaborated, for instance PMBok,² IPMA³ and PRINCE2⁴. There also exist many project management textbooks and guides, but there are surprisingly few dedicated treatments dealing directly with surveys (Stouthamer-Loeber & van Kammen, 1995) or indirectly (Lyberg et al., 1997). Likewise, survey methodology textbooks rarely have explicit chapters covering project management, although they may partially cover these issues in

sections on survey administration. A more structured discussion of project management issues in surveys – not specifically geared to web surveys, but to surveys in general – can be found in Iarossi (2006) and Kennedy, Tarnai, & Wolf (2010).

6.3 THE WEB SURVEY PROFESSION

Conducting web surveys requires familiarity not only with survey methodology, but also with ICT, statistics, management, legislation and with the broader social context, including ethics. Related competences are found at the intersection of various professions. In addition, a question of whether we can talk about a separate web survey methodology profession arises.

Generally, we talk about a profession when the following elements exist: formal education programmes, explicit occupation profiles, professional journals, dedicated international associations and events, as well as certain general codes and standards. The majority of these attributes are missing for web survey methodology. However, they do exist for survey methodology in general, which is the field to which web survey methodology predominantly belongs.

On the other hand, various professional activities specific to web survey methodology do exist, from regular events, dedicated courses (particularly in various summer schools), numerous research projects, professional networks, specialized standards and textbooks. We may also mention dedicated conference tracks, thousands of scholarly papers, presentations and other materials, including numerous online resources, as well as hundreds of web survey software packages, which often include related methodological guidelines. WebSM (<http://www.websm.org>) provides an exhaustive overview of these aspects.

From this point of view, we can talk about a certain professional knowledge and the corresponding elements of the profession, of which this book is a testimony. In the remainder of this section, we first review the scientific disciplines

where web surveys are applied and methodological research is conducted (Section 6.3.1). We also address the related legal (Section 6.3.2) and ethical issues (Section 6.3.3), formal codes and standards (Section 6.3.4), as well as informal guides and other materials (Section 6.3.5).

6.3.1 Related Disciplines

Web surveys are formally nested within the framework of survey research and within the broader context of social science methodology. In the narrowest sense, social science methodology often relates predominantly to sociology and to a somewhat lesser extent also to political science and communication studies. In any case, implementations of web surveys in these areas are highly relevant for web survey methodology.

In an even broader sense (e.g. OECD, 2002), the social sciences – and the implementation of web surveys – also include three other large streams: psychology, economics and educational science, as well as geography, urban planning, demography, management, public administration, law, management, organization science, and various specific areas such as evaluation research, social anthropology and linguistics. Marketing research, in particular, nested within the broader field of economics and business, is especially important for web surveys, because it is there that the majority of professional web surveys are conducted. A very important area of web survey implementation is also the specific cross-disciplinary context of so-called online research and Internet studies.

Besides the social sciences, web surveys appear in other sciences, especially in the humanities and medicine (health research), but also in various natural and technical sciences. The areas of statistics, computer science and informatics (e.g. HCI) are particularly relevant for web survey methodology.

To understand the role of web surveys in the various contexts, we should be aware that many disciplines have developed their own methodological approaches. Accordingly, the corresponding professions should be taken into

account when implementing web surveys; see the relevant textbooks: Iacobucci & Churchill (2015) for marketing research; Eysenbach & Wyatt (2002) for health studies; Bocarnea, Reynolds, & Baker (2012) for organizational research.

A very natural methodological environment of web surveys is the social science methodology, which provides the broader methodological framework for web surveys (e.g. Babbie, 2013). In particular, this holds true for the issues related to problem formulation, research steps, relationship of decision vs research problem, the conceptualization and operationalization process, as well as for general familiarity with the implementation of qualitative and quantitative research methods. More specifically, the survey research context is particularly important here. Throughout this book we have referred to the standard textbooks in this field, of Groves et al. (2009) and Biemer & Lyberg (2003).

On the other hand, for various specific aspects, other disciplines need to be consulted. For example, survey data analysis requires statistical knowledge (e.g. Heeringa et al., 2010), while web usability involves expertise from HCI (e.g. Roe, 2008).

According to the above overview of the related disciplines, the aspects of web survey methodology are very scattered, which is also a characteristic of survey methodology in general. Therefore, we can find these aspects within various professional associations, mostly related to survey research (AAPOR, CASRO, ESRA, ESOMAR), but also to Internet research (AoIR, AAAS, APA), social science methodology (ISA RC33), statistics (ISI, IASS, AMSTAT, RSS) and marketing research (ESOMAR, AMA, MRS), as well as areas related to computer science and informatics (ASC, ACM, IFIP-HCC). Large organizations (e.g. Eurostat) may also run specific activities related to new technologies in data collection (e.g. the New Techniques and Technologies for Statistics (NTTS) conference). None of the above professional organizations is dedicated exclusively to web surveys, and the same is also true for the corresponding activities and events. Nevertheless, dedicated and

continuous events related to web survey methodology exist: namely, the biannual Internet Survey Methodology Workshop⁵ and the annual International Workshop on Internet Survey and Survey Methodology⁶.

6.3.2 Legal Issues

Web surveys are closely interwoven with legislation, which can become very complicated particularly when we conduct international research. This is in general a very complex issue, and in our brief overview we will pinpoint and illustrate only the most essential aspects. More specific information and guidance can be obtained from local marketing, statistical or survey research associations.

Despite the trends towards global harmonization, legal settings vary considerably across countries, particularly with respect to criminal issues, privacy, intellectual property, telecommunication rules and consumer protection. Let us present a few of the crucial legal issues:

- Unsolicited email invitations: Can they be sent to private or business email addresses, which are public on the web?
- Cookies: How does legislation regulate them?
- Spam: What are the specific spam regulations?
- Incentive: What type and level of incentives are allowed and what administrative procedures accompany them?
- Lotteries or sweepstakes: How are lotteries or sweepstakes arranged from a legislation point of view?
- Privacy, confidentiality, anonymity: How are these issues legally regulated (for technical discussions, see Section 2.4.3)? How does one deal with situations where researchers take advantage of collected responses (e.g. for marketing purposes)?
- Paradata: Who has the right to capture, process, analyse, publish and archive them?
- Minors: How can children be involved in a web survey and what is the lowest age for their participation?
- Intellectual property rights: Is permission required to use a certain question? How is the

copyright for certain questions established and protected?

- Archiving: Whose responsibility is it if data disappear? What are the data archiving procedures?
- Software: Whose responsibility is it if a software bug causes damage?
- Illegal content: Whose responsibility is it when illegal content is uploaded by a researcher or respondents to the web questionnaire?
- Disclosure: Who is responsible if tables or data that enable identification of personal information are released?
- Security: Whose responsibility is it if an unauthorized person accesses the data during the (non-)encrypted answering process, via a stolen account, or directly by breaking into the server?

When web surveys run as a hosted service (SaaS), the *cancellation policy* and *taxes* can also become an issue, as well as the relationship between the respondent, a researcher and the supplier of the web survey service. Additional complications arise when the hosting service is separated from the software supplier, not to mention situations when all these subjects and services are in different countries with different legislation.

It is not surprising that the terms of use and the related legal clarifications of web survey software are becoming increasingly lengthy, often with separate sections on privacy, spam, cookies, security, incentives, cancellation policy, etc. A good illustration of this complexity are the popular web survey software services, where we can find up-to-date examples of elaborations on legal issues (e.g. terms of use, privacy issues). However, such detailed treatments are still not standard. A WebSM study (Vehovar, Čehovin et al., 2012) found that only 60% of suppliers include a privacy statement on their main website, while only 44% list conditions of use.

6.3.3 General Ethical Concerns

Ethical dilemmas are present in all steps and stages of the web survey process. Generally speaking they address the question of whether data, procedures, actions and non-actions related

to the web survey process may potentially harm other persons or groups. By harm we mean certain negative physical, psychological or societal experience and related negative feelings.

A typical problem, yet still a relatively light one, is whether to disclose the expected length of the web questionnaire in advance – when we know that it is above 30 minutes – and then run the risk of a decline in cooperation rates (Crawford et al., 2001; Galesic, 2006). Likewise, we have mentioned that seeking explicit consent that paradata can be captured substantially decreased cooperation (Couper & Singer, 2013), which is problematic for the entire *informed consent* approach (Losch, 2008) that requires respondents explicitly to agree – before undertaking the survey – that they are aware of the purpose, rights and potential harm of the research.

A more extreme example would be a web respondent reporting various problematic issues in a web survey, from illegal activities (e.g. stealing, drug trafficking, illegal gun ownership) and eventual critical inner states (e.g. depression, suicide attempts) to serious crime issues (e.g. attempted murder, paedophilia practices). In such cases, keeping the promise of anonymity and non-disclosure can become a very serious ethical dilemma for a researcher. We provide some illustration of typical ethical dilemmas in web surveys in the Supplement to Chapter 6, *Examples of ethical dilemmas in web surveys* (<http://websm.org/ch6>).

The treatment of ethical aspects varies across countries to a lesser extent compared with the variation of legal issues. However, a larger variation in ethical aspects is seen across different institutions and associations. Instead of inspections and juridical systems, various ethical committees and boards monitor the rules and may impose profession-specific sanctions (e.g. formal warning or even expulsion from a professional association). Sometimes (e.g. in health research) explicit pre-approval is required from an ethical body before the start of the survey. In the United States, for example, research in most institutions (academic, public and sometimes private) is subject to Institutional Review Boards (IRBs), and surveys are examined in order to

ensure the protection of safety, rights and welfare of the respondents. The American Association for Public Opinion Research (AAPOR) maintains a special section on its website dedicated to IRBs and survey research practices.

We recommend familiarity with ethical codes before the start of a web survey project, in order to identify and address potential problems. The recommendation of which ethical code to read is less straightforward. Groves et al. (2009) provide a good starting point for the general survey research context.

6.3.4 Formalized Certificates, Codes and Standards

In previous sections we mentioned the general legal and ethical issues that need to be taken into consideration when conducting web surveys. More specific elaboration is usually found in various codes and standards for conducting research, which have been established by professional research associations within the context of formal certificates and standards. Since the methodological, legal, ethical and professional aspects are usually interwoven in such codification, we treat them all together in this section.

With respect to project management, we have already mentioned specific standards (e.g. PMI-book, IPMA and PRINCE2), and other quality management approaches and certificates (e.g. Six Sigma TQM). General management, administration and processing standards (e.g. ISO 9001) can be obtained from professional certification organizations (e.g. ISO⁷ or BSI⁸). Some more specific standards may appear relevant for web surveys, as we mentioned in the related discussions on usability, security or archiving. Similarly, we referred to two survey-specific ISO standards:

- ISO 20252 Market, opinion and social research. Vocabulary and service requirements (ISO, 2012).
- ISO 26362 Access panels in market, opinion and social research. Vocabulary and service requirements (ISO, 2009).

Obtaining and maintaining these certificates confirms that an organization complies with certain standards and may also help to qualify a research organization for big clients. However, this is expensive (e.g. ISO or BSI).

In addition to these certificates, which are commercialized to a considerable degree, various other codes, standards and guides – directly or indirectly related to web surveys – exist and are typically freely available in the context of professional associations and organizations. These may be stand-alone documents dealing exclusively with web surveys or just explicit sections in some broader documents. The corresponding focus is typically coloured with the mission and specifics of the organization/association (e.g. survey methodology, marketing or statistics). A monitoring and/or appeal body may also exist to overview and clarify issues.

In terms of specific international treatment related to web surveys, ESOMAR is particularly a very rich source that provides several guidelines, including ‘Guideline for online research’, ‘Guideline for social media research’, ‘Guideline for conducting mobile marketing research’, as well as ‘Questions to help buyers of online samples’. Similar guidelines are also provided by the Marketing Research and Intelligence Association in ‘Ten questions to ask your online survey suppliers’ (MRIA, 2013).

Ethical decision making and Internet research are also fully elaborated within the context of Internet research surveys (AoIR, 2012). International aspects of professional ethics are also provided by the Global Research Business Network (GRBN), which published a study comparing codes of professional conduct in Australia, Canada, Germany, the UK and the United States, with a specific section dedicated to Internet research.⁹

Specific web survey aspects are discussed in the CASRO ‘Code of standards and ethics for survey research’ (CASRO, 2011) and in the Council of German Market and Social Association’s ‘Directive for online surveys’ (Rat der Deutschen Markt- und Sozialforschung eV, 2007).

We should also mention the resources provided by AAPOR with respect to standards and ethics, including the elaboration of disposition

codes (AAPOR, 2011), as well as the annual review of new books (English language only) in public opinion, survey methods and survey statistics (Callegaro, 2014a).

With respect to general statistical aspects, Eurostat’s professional code is very informative (Eurostat, 2011). Various other professional codes and standards exist, particularly within national associations and large organizations; an overview can be found at WebSM.

We may also recall here the importance of general W3C technical standards on the web (e.g. HTML or CSS code) and particularly the compliance with web accessibility standards (e.g. the US Rehabilitation Act, Section 508¹⁰).

6.3.5 Informal Guides, Recommendations and Other Material

Despite the certificates, codes and standards discussed above, in practice there is still a considerable dearth of practical guidelines about how to run web surveys. This gap is filled in part by various informal guides, which predominantly appear on the web.

The main stream of these materials originates from web survey software suppliers. They understand that selling the software and related services represents only one part of their business and that providing methodological guides, hints, training and best practice material from the broader methodological field – and not merely support for specific software features – is an important part of their mission. These materials range from simple how-to-do checklists and systematic tutorials to special user conference events and profound methodological materials, including white papers and even books (e.g. Bhaskaran & LeClaire, 2010).

According to a WebSM study (Vehovar, Čehovin et al., 2012), out of 377 software suppliers, 67% offer basic methodological documentation on how to conduct surveys. 30% offer specific white papers, while 17% include extensive documentation and 9% have

methodological documentation in a formalized PDF file. An overview of their recommendations is summarized in the Supplement to Chapter 6, *List of web survey software methodological recommendations* (<http://websm.org/ch6>).

Another stream, which fills the gap in popularizing the best practices in web survey methodology, is represented by the blogs and other regular postings on the web. There might be some promotional noise in these postings, but much valuable insight can be obtained on the current state of affairs in web survey methodology. The WebSM organizes blogs into four main categories:

- Expert blogs, which are maintained by survey methodology professionals and marketing professionals.
- Association and media blogs, which strive to discuss contemporary survey methodology objectively and are not directly involved in selling survey software or providing methodological advice.
- Web survey software supplier blogs, which are a part of the supplier's marketing and sales strategy, but also offer relevant information because they must be interesting to a broader audience to be successful.
- Research organization blogs from the private, public and non-profit sectors which deal extensively with web survey methodology.

In 2014, the WebSM database¹¹ contained around a hundred blogs and other online sources, which more or less regularly address issues related to web survey methodology.

6.4 WEB SURVEY BIBLIOGRAPHY

We introduced the WebSM website <http://www.websm.org> in the Preface and referred to it in all the chapters, particularly with respect to supplementary materials, the web survey software list, blogs and other information. However, the core mission of WebSM is its bibliographic database, established in 1998. The selection and inclusion

process is routinized and relies on a regular overview of around a hundred sources and also on an elaborated strategy to deal with new entries detected by search engines.

In WebSM the bibliographic entries are included according to three criteria: (a) the source is publicly available; (b) at least the abstract exists; and (c) the entry is based on research with relevance to web survey methodology. Since a methodological research focus is essential for establishing this relevance, various descriptive research project reports or marketing research conference papers are beyond the scope of the database. On the other side, some more general bibliographic entries are also included, because of their high indirect relevance for web survey methodology. They span from general social science methodology, general survey methodology, and CASIC, through usability research, HCI, online qualitative methods, Internet studies, research on online communities, e-learning to important case studies from different substantive fields where web surveys are used to collect data. This indirect criterion is more arbitrary, but we believe the approach has been consistent through the years.

The bibliography is structured according to scholarly entries (journal papers, books, edited books, book chapters) and other types (magazine papers, newsletters, conference proceedings, conference material, theses and diplomas, reports, business material, etc.). Each bibliographic entry is described with standard codes for publication type, title, author(s), source, year, abstract and source database for full text, and also with specific codes for scientific field, topic, country, target population and related topics.

We provide here some insights into the WebSM bibliographic database structure for publications dating up to 2013. The scholarly ones amount to 2,888 out of 6,890 entries, the remaining ones belonging predominantly to various conference materials, proceedings and other documents.

The 10 journals with the largest number of entries (journal papers) in the WebSM

database – each journal having more than 10 entries – can be sorted in descending order as follows: *Quirk’s Marketing Research Review*, *Public Opinion Quarterly*, *Social Science Computer Review*, *Journal of Official Statistics*, *International Journal of Market Research*, *Survey Practice*, *Behavior Research Methods*, *Computers in Human Behavior*, *Journal of Medical Internet Research* and *Marketing News*. These journals essentially reflect the structure of the related scientific fields and disciplines discussed in Section 6.3.1. The majority of the entries are from the social sciences, followed by marketing, health, Internet research, psychology and education, with a strong overlap with general social science methodology, computer science and statistics. Of course, this structure differs greatly from the structure of actual web survey projects, as well as from the structure of daily completed web questionnaires.

With respect to region, US-related research contributes the majority of entries (53%), while, for conferences, AAPOR has by far the most entries, followed by ESRA (European Survey Research Association) and GOR (General Online Research).

Regarding the trends shown in Figure 6.2, there seems to be a steady increase of new entries over two decades, following the initial publication year of 1994, when the very first scholarly publication directly related to web survey methodology appeared (i.e. Pitkow & Recker, 1994). After 2004, the increase in annual input has slowed down to around 500 entries per year, of which 150–200 are scholarly entries. An unexplained decline occurred in 2006. It is interesting to note that similar observations on trends were found by a meta-study of related publications on web survey research in China (Zhang, Shao, & Fang, 2008).

As for authors, there were 8,323 in the database by the end of 2013, of whom 4,741 contributed some scholarly input. In both cases the largest part (76% and 84% respectively) contributed only one entry. We might say that the entry level for publishing in this area is relatively low, but this is more likely due to the fact that the main research focus of the authors is outside web survey methodology.

In Figure 6.3, we illustrate a co-authorship network of authors in the field of web survey methodology using the Pajek tool for network

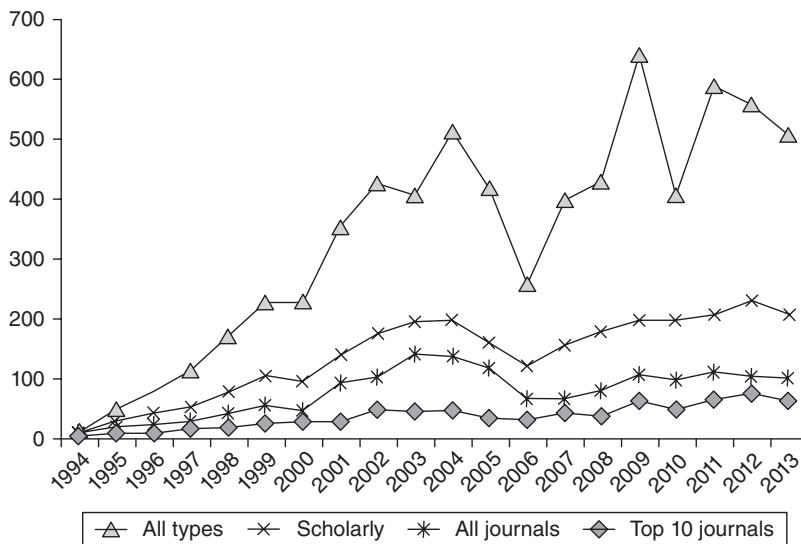


Figure 6.2 Bibliographic entries in the WebSM database according to publication year (1994–2013) and publication types

analysis (de Nooy, Mrvar & Batagelj, 2011). For this purpose we run additional analysis on November 2014 WebSM bibliographic database, including only scholarly publications with direct relevance to web survey methodology. In Figure 6.3 only 72 authors with five or more scholarly bibliographic entries appear and all together they produced 528 entries included in this analysis. Each author is presented with a circle and its size reflects the number of their entries in the WebSM database, for example Couper with 53, Reips with 42, and Dillman with 31 entries. Altogether, there are 25 authors with more than 10 entries. The weight of the lines linking the authors reflects the number of scholarly entries written in co-authorships, for example Couper-Tourangeau with 14 entries written in co-authorship.

We should not forget that this illustrates only bibliographic entries that are directly relevant for

web survey methodology and that it excludes eventual other scientific bibliography of the authors.

It is interesting to note that 52 of the 72 authors in the figure present the largest component in the network (the largest sub-network of connected authors). Thus, this is a relatively small network and as we (the authors of this book) personally know almost all of these researchers, we observe that web survey methodology is a dominant research focus only for a few of them. The great majority are involved in general social science methodology, general survey methodology and various substantive fields (e.g. sociology, psychology).

The list of all bibliographic entries included in the above figure, together with some further statistics on the bibliographic entries (research topic, language, sources, etc.), can be found on WebSM as the Supplement *Statistics of WebSM bibliography database* (<http://websm.org/ch6>).

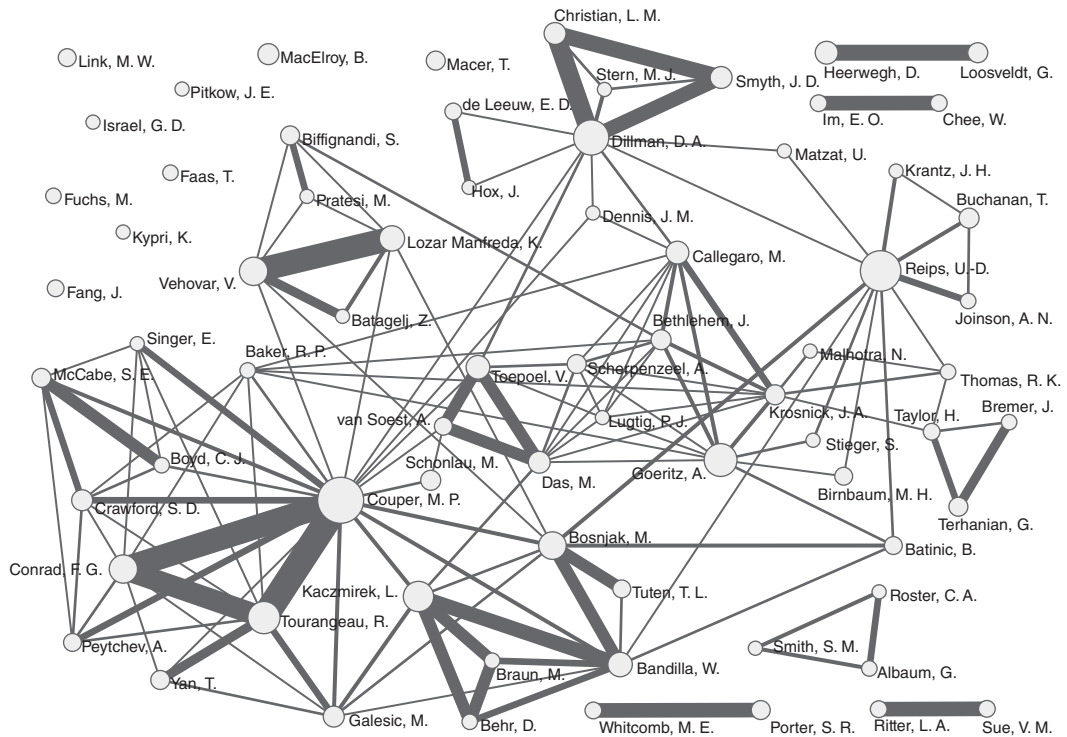


Figure 6.3 WebSM co-authorships for authors with five or more scholarly entries with direct relevance to web survey methodology, November 2014

We can conclude that professional activities related to web survey methodology have stabilized at a certain level. In future we expect that web surveys will become even more integrated into the general social science methodology context, as well as into the general management framework. The borders with survey methodology will become increasingly blurred, which we further discuss in Chapter 7 on future trends.

NOTES

- 1 See pages 20–21 in Institute of Public Health presentation on data aspects, available at <http://www.websm.org/nijz13>
- 2 <http://www.pmi.org/PMBOK-Guide-and-Standards.aspx>
- 3 <http://ipma.ch/resources/ipma-publications/ipma-competence-baseline/>
- 4 <http://www.prince2.com/prince2-methodology>
- 5 <http://workshop.websm.org>
- 6 <http://kostat.go.kr/iwis/index.html>
- 7 ISO standards: <http://www.iso.org/iso/home/standards.htm>
- 8 BSI certification: <http://www.bsigroup.com/>
- 9 <http://www.websm.org/grbn12>
- 10 <http://www.websm.org/508>
- 11 <http://www.websm.org/blogs>