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HOW TO RESEARCH MULTIPLE MIGRANTS? INTRODUCING WEB-BASED RESPONDENT-DRIVEN SAMPLING SURVEY

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Abstract

Multiple migrant populations are an under-researched group, perhaps because they pose particular challenges for survey research. First, they represent what literature refers to as a *hard-to-survey population* (Tourangeau 2014). Second, multiple migrations require taking into account multiple spatialities and hence highlight the potential of multi-sited research (originally developed within ethnographic studies). This working paper outlines some of the challenges related to quantitative research of multiple migrations that span multiple locations. Web-based Respondent-Driven Sampling (Web-based RDS) is presented as one solution to researching hidden populations of multiple migrants based worldwide, for which sampling frames are not available. RDS was initially designed for studying hidden populations (Heckathorn 1997). Web-based RDS is a version of the RDS carried out online. As in traditional RDS, in Web-based RDS, recruitment of respondents relies on migrant networks and utilises a dual incentive system. The online survey mode allows relative ease and low cost in reaching respondents based in various locations.

Key words: hard-to-survey population, multiple migrations, multi-sited research, Respondent-Driven Sampling, Web-based Respondent-Driven Sampling

Abstrakt

Migranci wielokrotni należą do mało przebadanych grup, co może wynikać ze specyficznych trudności w realizacji badań sondażowych na tej próbie. Po pierwsze, stanowią oni jedną z opisywanych w literaturze *populacji trudnych do zbadania za pomocą metod sondażowych* (Tourangeau 2014). Badania na migrantach wielokrotnych, gdzie szczególną wagę ma wymiar przestrzenny migracji, skłaniają do korzystania z potencjału badań wielostanowiskowych (wywodzących się z etnografii). Ten artykuł zarysowuje wyzwania związane z ilościowymi badaniami migrantów wielokrotnych w różnych lokalizacjach. W przypadku ukrytych populacji migrantów wielokrotnych, rozproszonych na całym świecie, nie istnieje operat losowania. Dlatego proponujemy metodologię *Web-based Respondent-Driven Sampling* (*Web-based RDS*) dla badania migracji wielokrotnych. Metodologia RDS została zaprojektowania do badań ukrytych populacji (Heckathorn 1997), zaś *Web-based RDS* jest jej wersją, przeprowadzaną za pośrednictwem Internetu. Tak samo jak w przypadku tradycyjnego RDS, w tej wersji rekrutacja respondentów wykorzystuje sieci migrantów oraz

używa podwójnego systemu nagród. Prowadzenie badania przez Internet umożliwia dotarcie do respondentów na całym świecie w stosunkowo łatwy i efektywny kosztowo sposób.

Słowa kluczowe: populacje trudne do zbadania za pomocą metod sondażowych, migracje wielokrotne, badania wielostanowiskowe, Respondent-Driven Sampling, Web-based RDS

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Contents

1. Introduction

Multiple migrants are an example of a *hard-to-survey population* (Tourangeau 2014), a term that refers to a population that, due to particular challenges, is more difficult to survey than the general population. The concept of multiple migrations was introduced and examined in more detail elsewhere (Salamońska 2017). To summarise the key points for our purposes in this paper, it is important to remember that multiple migrations involve repeated international movement (directed at various destination countries), and in this they differ from migrations that are most commonly addressed in the existing literature, such as permanent migration and migration followed by a return to the country of origin. The trajectories of multiple migrations can involve both short and long-term movements. They can also involve shorter and longer distances, either within or between continents. The sequence of movements in multiple migration can differ, as re-emigration can be preceded by temporary return(s) to the country of origin, or follow as an onward move from one destination country to another. Most relevant for this working paper is that the multiple temporalities and spatialities involved in these migrations pose challenges both to traditional migration research and to traditional survey research. Multiple migrants are, what Tourangeau (2014) terms, a *hard-to-survey population*, due to the difficulties with sampling, identification, reaching respondents, and persuading them to take part in the research. Moreover, researching multiple migration requires, in the first place, an approach that goes beyond methodological nationalism, which has dominated the social sciences in the 20th century. Instead, studying multiple migrants who are based worldwide involves multi-sited research, which is still not a common feature of migration studies. Although ethnosurveys follow migrants both in their places of origin and destination, migration studies generally do not sufficiently recognise that multiple destinations can be involved in a migration trajectory. Additionally research on migrants who are based and connected to different places (that is beyond the origin and destination countries) is still limited. This paper proposes a Web-based version of Respondent-Driven Sampling (RDS) as a methodology that is better suited to the challenges that multiple migrants pose to traditional survey research methods. There is a need to research migrants around the globe and online surveys can more effectively reach people in different places (even if various biases remain) and thus enable studying populations for which there is currently no sampling frame available.

The paper begins by outlining the challenges of researching migrants, and multiple migrants in particular, with special attention to issues of studying *hard-to-survey populations* (Tourangeau 2014) and the limitations of methodological nationalism. This discussion serves as a necessary context for the subsequent introduction of Web-based RDS surveys of multiple migrants as a methodology that can address some of the challenges and limitations.

2. Challenges related to studying migrants and multiple migrants as a *hard-to-survey population*

Populations of migrants and multiple migrants, which are in the focus of this working paper, are examples of what the methodological literature describes as *hard-to-survey populations* (Tourangeau 2014), in that they pose various difficulties at different stages of the research process. *Hard-to-survey populations* can be difficult to: 1) sample; 2) identify; 3) find/contact; 4) persuade to take part in the research; and 5) interview. Often some (or all) of these difficulties can occur simultaneously within the same study.

Multiple migrants constitute a small share of the migrant population (which in turn is only small part of society) and hence they fall under the definition of *hard-to-survey populations* (small in size, rare, and/or hidden). Multiple migrants also fit this definition as they are a sub-type of migrants. In the case of large populations, using some kind of general purpose sampling frame (e.g. an address or a random-digit dial) would be a possible strategy for survey research as non-members can easily be left out. When the target population is only a small fraction of the general population (10% is considered a cut-off line between the minor and major domains, see Schepers, Juchtmans, Nicaise (2017)) using a general sampling frame would not be efficient in terms of cost and time. This is because many members of the general population would have to be screened in order to find the relatively few members of the target population. Even in countries where researchers can avail themselves of sampling frames for migrants in general, there are no specific frames to sample multiple migrants.

Hidden populations are also difficult to sample. This term refers to populations 'whose membership is not readily distinguishable or enumerated on the basis of existing knowledge and/or sampling capabilities' (Wiebel 1990: 6). Historically, the term has been used to describe clandestine, deviant and/or illegal groups such as drug users (Morgan 1996), as well as populations that are subject to social stigma and/or criminal prosecution (Salganik,

Heckathron 2004). Migrants, including multiple migrants, can be considered a hidden population because of, for instance, their legal status in the country of destination.

Surveys of migrants sometimes utilise 'location sampling' ('time-location sampling'), which bases sampling on sites where members of the target population are expected to appear (e.g. places where immigrants work, see Schicker, Hiruy, Melak, Gelaye, Bezabih, Stephenson, Noland, Patterson, Tadesse, Emerson, Richards 2015, or communities with high percentage of immigrants, see Nandi, Galea, Lopez, Nandi, Strongarone, Ompad 2011). Different probabilities of individuals to be sampled should be taken into consideration, and gathering information on respondents' attendance in a particular location can be used to weigh the data (Karon 2005). This sampling approach has been used in the case of migrants in general, but it would be difficult to define locations in which only multiple migrants gather. Moreover, this kind of sampling would take time and, with a high probability, frame of locations would not be complete as researchers would not be able to identify all the locations that could be important for the target populations (Tourangeau 2014).

Another difficulty with *hard-to-survey populations* is that they are *hard-to-identify*. Members of such populations cause problems during the screening stage. In the case of 'indirect' screening when one member of the household is asked about other members, it may be that the household member does not have relevant information. For this reason, it is important to have a clear, unambiguous definition of the target group (Schepers et al. 2015) that is understandable to respondents. In the case of multiple migrants, an additional difficultly is that even if household members can identify migrants that fit the study target, they do not necessarily have information about their earlier migration trajectories.

Even if respondents have relevant information, sometimes they will not want to identify individuals with the relevant characteristics in screening interviews, especially if the characteristics are sensitive and/or stigmatising. Similarly, during 'direct' screening the individual may not want to identify himself/herself as marked by relevant characteristics. This may happen in cases of undocumented migrants (both one-off and multiple ones). Identifying respondents to outsiders (i.e. the researcher) may be considered undesirable not only due to shame, but also in order to avoid possible legal repercussions. Identifying members of such groups requires building trust between researchers and respondents (Schepers et al. 2015).

Sometimes members of the target population are relatively easy to identify, but the problem lies in reaching them. *Hard-to-reach populations* are difficult to locate. Tourangeau

(2014) distinguishes four groups of hard-to-reach, highly mobile populations: members of traditionally nomadic cultures, itinerant minorities, temporarily mobile or displaced persons, and people at a mobile stage in their life cycle (e.g. students). Multiple migrants can be another type of highly mobile populations. Even when they are identified, contacting members of such a target population can be difficult. An example are individuals living in gated communities, groups that do not trust outsiders (e.g. undocumented immigrants) or, in case of online research, electronically excluded individuals.

After finding and contacting potential respondents, researchers must persuade members of the target population to take part in the study. While there is general trend of rising non-response rates (Smith 1995), some populations can be particularly difficult to convince to take part in research. Characteristics other than migration may play a role. Individuals who are socially isolated would be difficult to persuade, while appealing to altruism would enhance the chances of respondents taking part in the research (Tourangeau 2014). Also lack of trust in research in general and in the researcher can prevent individuals from cooperating (Schepers et al. 2015).

Finally, some populations may be *hard-to-interview*, although this issue does not seem to be specific to the multiple migrant population. For some, such as underage individuals, interviewing requires securing additional consent from caretakers, parents, or guardians. Individuals with cognitive or physical impairments are another example of a target population that poses difficulties for conducting interview. Language barriers can render migrants a population that is *difficult-to-interview*. Solutions to such difficulties can include preparing multiple versions of the questionnaire, translated into relevant languages.

Multiple migrants are an example of *hard-to-survey population*. First, they are a *hard-to-sample population*, as no sampling frame exists and, by definition, they are highly mobile. Especially in countries where multiple migrants constitute a small proportion of the wider population of migrants, the cost of screening interviews would be high (even if a sampling frame for the general migrant population existed). Difficulties in identifying multiple migrants may occur in case of undocumented migrants as well as via indirect identification. Multiple migrants are also *hard-to-reach* because of their high mobility.

3. Beyond methodological nationalism: introducing multi-sited research for studying multiple migration

Multiple migrations introduce multiple spaces into our thinking about migration: migrants move out from their place of origin to a first destination, but then move to another location, once or more, at later stages. For multiple migrants, therefore, multiple localities are involved and some of these places may constitute gates or stepping-stones to future destinations. This reality of multiple migrants requires new methodological lenses, which are better suited to tracking mobile individuals and take a multi-sited approach to studying multiple migrants around the globe.

Within sociology, the notion of the 'mobility turn' and Urry's *Sociology Beyond Societies* (2012) significantly challenged the dominant thinking within a nation-state framework, which was also germane to migration research. Already in the 1970s, Martins diagnosed that: '[I]n general, macro-sociological work has largely submitted to national pre-definitions of social realities: a kind of methodological nationalism (…) imposes itself in practice with national community as the terminal unit and boundary condition for the demarcation of problems and phenomena for social science' (1974: 276). Within migration studies, too, methodological nationalism guided and informed scholars' imaginaries to see nation/state/society as a natural social/political frame for the modern world (Wimmer, Glick Schiller 2002).

Wimmer and Glick Schiller (2002) enumerate several forms of methodological nationalism, but in this paper we refer primarily to 'the territorialization of social science imaginary and the reduction of the analytical focus to the boundaries of the nation-state' (Wimmer, Glick Schiller 2002: 307). The focus within social sciences on processes taking place within nation-states overlooks the broader landscape of connections between nation-states (Wimmer, Glick Schiller 2002). Moreover, methodological difficulties emerge from a reliance on the nation-state model, which are connected, for example, to defining the scale of comparison (e.g. very small and very big countries) or historical changes (e.g. changes in state borders) (FitzGerald 2012). The concept of multiple migrations is useful particularly because it highlights that individual biographies can be made up of nodes that link various countries and localities (beyond the origin-destination dichotomy) through multiple migration moves. According to Marcus: 'Migration studies are perhaps the most common contemporary research genre of this basic mode of multi-sited ethnography' (Marcus 1995: 106). Both one-off and multiple migration can highlight the shortcomings of methodological nationalism, but

the latter requires attention to multiple spaces in order to facilitate thinking about international movement.

The study of multiple migrations is closely related to research on social transnationalism. The boundary between research that focuses on multi-sited (multilocal) and transnational migration seems to be blurred, among other reasons because 'what current multilocal projects have in common is that they draw on some problem, some formulation of a topic, which is significantly translocal, not to be confined within some single place.' (Hannerz 2003: 2006). Transnational research strategies in migration studies emerged in the early 1990s as a result of the new social realities of globalisation and the accelerating flows of capital, goods, information, and people (Fauser 2017).

As with research on transnational communities, understanding multiple migrations also requires seeing new elements of social reality. A broader lens will include, among others, processes of transnationalisation (cross-border ties), transnational social spaces (prolonged concentration of such ties and practices), and transnationality (a continuum of ties and practices, from less to more intense and regular) (Faist 2012). Faist (2012) also explains how the transnational approach proposes that the nation state is only one of the possible units of analysis, but the context of migration can be better understood when taking into account other units, including households, networks and organisations.

In practice, migrations have been researched primarily on the level of destination countries, usually by national statistical bodies that collect: quantitative data on migration flows and stocks, and mostly with regard to immigration, not emigration or temporary mobility (Beauchemin 2014). The nation-state has remained not only the main frame for administrative data, but also the main context for migration research as well. Similarly, empirical research often takes place within the territorial framework of the nation-state. This has consequences for gathering data and its subsequent analysis (Faist 2012).

Relating multiple migration to multiple spaces calls for a different approach than studying a single destination country. We can see multiple migrations as both contained to nations-states and as part of flows spanning a global space. We can think of multiple migrations in the context of globalisation, and new information and communication technologies (ICT), which sustain migrants' movements and connections across the globe. Multiple migrants escape approaches that focus on a single destination country because their trajectories pass through multiple places. An alternative approach to exploring the

geographical reach of multiple migrations is what was initially referred to as multi-locale research. This research design dates back to reflections on the study of world systems by Marcus (1986, 1995). It is able to encompass multiple places, but involves qualitative methodologies. Falzon (2016) summarises what is at the core of such approaches: 'The essence of multi-sited research is to follow people, connections, associations, and relationships across space (because they are substantially continuous but spatially non-contiguous). Research design proceeds by a series of juxtapositions in which the global is collapsed into and made an integral part of parallel, related local situations, rather than something monolithic or external to them. In terms of method, multi-sited ethnography involves a spatially dispersed field through which the ethnographer moves – actually, via sojourns in two or more places, or conceptually, by means of techniques of juxtaposition of data.' (Falzon 2016: 1-2)

Within qualitative studies, multi-sited (or multi-locale) ethnographies explored two or more sites (locales) simultaneously, and were able to show their interconnections (Marcus 1968). These methodologies are constructed around 'paths, threads, conjunctions, or juxtapositions of locations in which the ethnographer establishes some form of literal, physical presence, with an explicit, posited logic of association or connection among sites that in fact defines the argument of the ethnography' (Marcus 1995: 104). Based on the assumption that individuals maintain transnational attachments, this research enables a study of linkages, exchanges and feedback effects between places (Fauser 2017). Objects of the study are constructed through movement, which can be planned or opportunistic. The selection of sites to be included in the research is connected with the research design, but also with emerging possibilities. Places can be chosen gradually, according to new insights and opportunities (Hannerz 2003). In their movement, researchers can follow certain people, things, metaphors, stories, biographies, or conflicts (Marcus 1995). The first strategy of 'following the people' especially departs from the classical anthropology concept of culture as something restricted to a group of territorially bound individuals. Multi-sited research focuses on individual and/or collective relationships across locations: how they are formed and maintained and what are their implications (Fauser 2017). Comparative studies can enable researchers to gain access to members of complex networks and explain an interplay of factors in origin and destination countries that influence migrations (FitzGerald 2012).

There are, however, doubts about whether multi-sited research can achieve the same level of deep knowledge that characterized traditional ethnographies (FitzGerald 2012).

According to Burawoy, changing places can cause anthropologists to 'substitute anecdotes and vignettes for serious field work' (2003: 673). Even in the traditional one-site approach to ethnographic research, however, it is not the geographical field that guides research (Emerson 2001 after FitzGerald 2012). The boundaries of a given field always have to be delineated through theory, thus multi-sited fieldwork is 'even more dependent on a clear theoretical orientation and strategic site selection than work in a single site' (FitzGerald 2012: 1727) as there is a risk of time and resources being stretched too thin. Also, as Hannerz (2003) notes, multi-sited research tends to focus on a limited research problem, prioritises establishing deep, emotional relations between researchers and 'natives,' and so foregoes ambitions for a holistic perspective.

Initially, transnational research was dominated by qualitative methods, which is reflected in the literature review above. It was also ethnographic, single-case studies that gave rise to criticisms regarding a lack of operational definitions and a scarcity of data about size, scope and determinants of transnational practices (Guarnizo, Portes, Haller, 2003). Multi-sited research began to develop within quantitative approaches as a response to these weaknesses and critiques. Beauchemin (2014), referring to quantitative data, argues for the use of multi-sited strategies, including more than one (destination) country, and for a widening of the focus to include connections or comparisons between countries. It would thus be possible to analyse and compare situations of groups in different places: migrants and non-migrants, or migrants who stayed in their destination country and returnees. Such a perspective would enable identification of the causes (and selectivity) of migration/return migration, but also assimilation processes; however, the origin-destination dichotomy remains, its main advantage being that diagnosing causal mechanisms requires data on the counterfactual situation in order to enable comparison (Beauchemin 2014).

Multi-sited studies require data from multiple places, which are sometimes geographically distant. This poses a methodological challenge for data collection. Beauchemin (2014) proposed four possible methodological approaches to multi-sited research, which are summarized in Table 1 below.

Table 1 A Multi-sited Approach to Strategies for Data Collection

Approach	Description
Absentee approach	• data collection carried out in one site; • members of the household are asked about migrants (or migrants are asked about family members that stayed in their country of origin); • two main limitations: lack of a standardized definition of absentees/migrants and doubtful accuracy of data collected indirectly, through proxy respondents; • allows collection of information on migrants regardless of destination country (unless of course, the whole household moved).
Follow-up approach	• follow migrants in their mobility; • usually, due to the cost and vulnerability of migrants, restricted to one destination country; • enables researcher to gather data on selectivity for return or onward migration in order to understand assimilation processes.
Ex-post merging approach	• makes use of data collected independently in different countries (without initial intention to merge them); • data can be merged as aggregates (macro ex-post merging approach) or as individual level data (micro ex-post merging approach); • challenges remain: missing data, lack of standardized definition of migrants, state border changes.
Multi-sited survey approach	• collect data sets in different countries with the intention of merging them; • questionnaires have to be identical in all countries and adapted to all contexts; • in interpretation of the data, background information needs to be taken into consideration; • an important advantage of this approach is the possibility of collecting data from migrants directly; • representativeness is a limitation as no country holds statistics that can be used as a sampling frame (that would require public statistics on all country citizens abroad).

Source: based on Beauchemin 2014.

Although promising, a multi-sited approach also poses serious challenges. In practical terms, it requires large-scale collaborations between academics based in various countries, which may solve some logistical difficulties but can also create new challenges. Distance and differences in academic backgrounds might necessitate additional actions (e.g. training and standardisation of research tools) in order to establish common epistemological and methodological frameworks (FitzGerald 2012).

Other potential difficulties relate to sampling. There are three possible sampling strategies in multi-sited research. 1) Samples can be unlinked, as when sampling is carried out independently in each location. For example, migrants can be compared to non-migrants (in their country of origin). 2) Linked samples use ties between migrants and non-migrants (and migrants in different countries of destination). For example, researchers may try to contact individuals coming from one village in the country of origin, who are presently living in one or more destination places. These ties are used instrumentally to help researchers locate members of a target population, but do not constitute research problem in itself. 3) Finally, the third strategy involves matched sampling and focuses on transnational ties as it takes into consideration personal networks. For example, respondents/interviewees can be asked about their significant others abroad (Fauser 2017).

Multi-sited research remains a relatively rare methodological choice among quantitative researchers, with its challenges and costs outweighing its potential advantages for migration research.

4. In search of solutions: Respondent-Driven Sampling and online surveys

As discussed above, the study of multiple migrants faces several challenges. One relates to the fact that multiple migrants are a *hard-to-survey population*. A second issue relates to taking into account the multiple locations in which multiple migrants are based. The following subsections introduces Respondent-Driven Sampling (RDS) as a possible solution to sampling of multiple migrants. The online survey mode is also described as a tool that has potential benefits in research focused on geographically dispersed groups of multiple migrants who are proficient users of ICT.

4.1. Dealing with the lack of a sampling frame – Respondent-Driven Sampling

Migration scholars who study multiple migrants have to deal with the fact that, for this group, there is no sampling frame (i.e. some kind of a list of all members of the population), which could be used to draw a representative sample. Additionally, multiple migrants are a small fraction of the general migrant population, which makes screening efforts aimed at identifying multiple migrants very costly. One sampling strategy that can deal with the lack of a sampling frame in the case of rare and/or hidden populations is Respondent-Driven Sampling (RDS).

RDS was first introduced by Heckathorn for research on hidden populations, a term that refers to populations for which there is no sampling frame and which are characterized by privacy concerns as the membership is illegal or stigmatised (Heckathorn 1997). RDS is also based on the assumption that members of such populations are in some way connected to or know about each other. Examples of such hidden or stigmatised groups can include drug users (Crawford 2014), sex workers (Simic Johnston, Platt, Baros, Andjelkovic, Novotny, Rhodes 2006), or members of the LGBT community (Ramirez-Valles, Heckathorn, Vázquez, Diaz, Campbell 2005, Bengtsson, Lu, Nguyen, Camitz, Le Hoang, Nguyen, Liljeros, Thorson 2012, Truong, Grasso, Chen, Kellogg, Robertson, Curotto, Steward, McFarland 2013). RDS was especially useful in HIV/AIDS studies. Meta-analysis of 123 studies outside the USA between 2003 and 2007 proved that RDS is an effective technique for sampling most-at-risk populations (Malekinejad, Johnston, Kendall, Kerr, Rifkin, Rutherford 2008). Worthy of note is that RDS has also been used in non-stigmatised groups, such as jazz musicians. In such cases, privacy concerns are not the result of illegality or stigmatisation, but rather of the tightness of informal networks, which are hard to penetrate by outsiders (Heckathron, Jeffri 2001). In migration research, RDS was mostly used for researching migrants in high-income countries, but could also be useful in low- and middle-income countries (Lattof 2018). RDS was proven to be faster (although more expensive) than quota/convenience sampling. Additionally, the quality of data obtained with RDS is higher than with quota/convenience sampling in terms of reducing non-response, length of interviews, and reaching different types of migrants (Górny, Napierała 2016).

RDS is a chain-referral sampling methodology that draws on Markov chains and the theory of biased networks (Heckathorn 1997). Information about network and recruitment structure is used to calculate relative inclusion probabilities, population indicators of minimal bias and the variability of these indicators (Heckathorn 1997, 2002; Wejnert Heckathorn 2008).

In order for RDS to be successful, several requirements must be met. First, the final sample should be independent from the initial respondents (known as seeds) if referral chains are sufficiently long (i.e. a sufficient number of cycles or waves of recruitment is reached). With a sufficient number of waves, the composition of the sample will become stable as all members of the target population will have a non-zero probability of being recruited (proportionate to the number of individuals they are connected to) independently of the seed sample composition (Heckathorn 2002, Salganik, Heckathorn 2004). Accordingly, it is

important to increase the length of the referral chain (Heckathorn 1997). Secondly, observations gathered during the sampling process can be used to calculate relative inclusion probabilities for respondents. This allows for obtaining unbiased population estimates and their variability (Wejnert, Heckathorn 2008). Salganik and Heckathorn (2004) proved that the RDS estimator is asymptotically unbiased (the bias is equal 1/sample size, so it is negligible in samples of meaningful size). The assumptions underlying RDS are summarised in Table 2 below.

Table 2 RDS Assumptions

No.	Assumptions
1	Respondents maintain reciprocal relationships with individuals who they know to be members of the target population.
2	Respondents are all linked into a single component in the network.
3	Sampling is with replacement.
4	Respondents can accurately report their personal network size (number of relatives, friends, and acquaintances who fall within the target population).
5	Peer recruitment is a random selection of the recruiter's peers.

Source: based on Heckathorn 2007.

While RDS provides answers to some of the challenges identified in the previous section and thus seems to offer a promising approach to studies of *hard-to-survey populations*, traditional face-to-face versions of RDS take place in select locations that must be easy to reach by survey respondents. This implies a geographically limited scope. In the following section, we turn to online survey research as a strategy to reach spatially dispersed migrant populations.

4.2. Research at various locations where multiple migrants are based – the online survey mode

Like migrants in general, multiple migrants, are based in different locations across the globe. Online surveys can be used to capture this geographical diversity of destinations, and we outline the advantages and disadvantages of this mode below. For digitally proficient populations, online surveys provide the possibility to collect data irrespective of where respondents are based.

As Toepoel (2016) notes, with more widespread use of the Internet we can also observe how online surveys have come to dominate data collection. This is due largely to two advantages of online surveys: the relatively low cost (due to less staff, equipment, travel, and office materials needed) and the relatively high speed with which online surveys can be carried out. Online surveys are suitable for reaching respondents in different geographical

locations, assuming that Internet coverage is high among the population in question. These features make on-line surveys particularly interesting for research of migrants. Online surveys allow for expanding the reach of a study to multiple sites where respondents are based, particularly if the study concerns a highly geographically dispersed population for which face-to-face interviews would prove costly considering travel to conduct interviews all over the world or the need to organise an international network of trained interviewers.

We summarise some of the key features of online surveys (see Couper 2011), especially against other survey modes, in order to highlight the appeal of Web surveys for the study of migrants. The online survey mode is a type of self-administered survey that is less susceptible to social desirability bias, which is an issue in other interview modes where the interviewer is present. The respondent can complete the online questionnaire in their own time and have a greater sense of privacy. Moreover, prospective respondents can feel more secure in their anonymity as they do not have to interact with researchers and so might be more likely to agree to participate in the study (Fox, Murray, Warm 2003) (even despite the fact that recent events of large-scale breaches show that personal data security can be compromised). Although Web surveys are often compared to surveys carried out via the post, there is a wide range of ways in which online surveys can be implemented. For instance, similar to face-to-face interviews, online surveys can incorporate oral and visual channels of communication. Importantly, online surveys utilise technology on the side of the respondent, so both high Internet coverage and proficiency with ICT among the target population are required.

There are also disadvantages to online surveys, as Couper (2011) documents. Eliminating the interviewers reduces the costs of research and the errors that might be introduced by interviewers, but it does increase the possibility of errors related to nonobservation (e.g. sampling and nonresponse) and measurement (e.g. effects on sensitive questions, ability to motivate, probe, assist, etc.) (Couper 2011). The absence of interviewers also means that it is not possible to obtain additional observations or to persuade prospective respondents to respond to the questionnaire. Additionally, although comparative research between surveys carried out by post and online points to lower response rates in the latter, it is unclear what the underlying reason is. There is also relatively little known about nonresponse bias differences between surveys done by post and online. Online surveys are easier and cheaper for researchers, which partly explains the proliferation of online surveys as a research mode, but there is a question about whether online surveys are attractive enough for

respondents to decide to participate. With increasing social digitalisation (Rana, Staron, Berger, Nilsson, Scandariato, Weilenmann, Rydmark 2015), the propensity for people to connect virtually increases and so does the possibility that researchers can reach potential respondents online. This seems to be especially the case for migrants who use ICT to stay in touch with friends and relatives. Certainly, digital exclusion still has to be taken into consideration as well as a sensitivity to the biases that any online research introduces.

5. Conducting Web-based RDS

RDS (introduced in general terms above) provides a sampling strategy for studying multiple migrants. The online survey mode can help to reach respondents scattered in various locations. In this section we propose a combination of the online survey and RDS, the Web-based RDS, which would facilitate reaching respondents in multiple sites and address at least some of the difficulties characteristic of studies of *hard-to-survey populations*. Web-based RDS is a version of RDS, but carried out online in multiple sites, with locations driven by the respondents' networks. It is based on the assumption that multiple migrants are part of and make use of virtual connections and networks. A brief overview of Web-based RDS studies, with information about the methodologies that were used, is presented in the Annex at the end of this paper.

While traditional RDS studies used PAPI (Paper and pencil interviewing) or CAPI (Computer-assisted personal interviewing*)* as the interview mode, a new form of RDS, Web-based Respondent-Driven Sampling (Web-based RDS), moves both the recruitment of respondents and the interview into the space of the Internet. Web-based surveys are 'an important advance in the evolution of self-administered questionnaires' (Tourangeau, Conrad, Couper 2013: 1). The fact that research can take place online is only natural in societies where people spend a significant part of their lives online. This mode of administration is convenient and intuitive for respondents. Web-based questionnaires enhance RDS efficiency as they allow researchers to reach various *hard-to-contact populations*, both from the top (gated communities) and the bottom (dangerous locations) of social hierarchy (de Rada 2012).

By using ICT, Web-based RDS additionally builds on strengths 'traditional' RDS: large populations can be sampled in a short time and with less resources (assuming that the target population is electronically connected). Moreover, Web-based questionnaires allow for a more sophisticated questionnaire design, for example using audiovisual materials (de Rada

2012). As some communities exist mainly or only online (e.g. on forums or social media groups that gather people around a specific interest), online questionnaires are the best, if not the only way to reach them (Wright 2005). In the web-RDS, sample size can be reached significantly faster than in traditional RDS because the whole process (from initial recruitment to recruiting further respondents) can be conducted at the respondents' electronic device without the need to leave the house (Wejnert, Heckathorn 2008). This means also that the scope of the study area is not geographically limited as in traditional RDS (Bengtsson et al. 2012). This feature of Web-based RDS makes it also different from multi-sited ethnography, where multiple sites might be suggested by respondents but are ultimately selected by the researcher. In Web-based RDS, it is the respondents who drive the recruitment of further respondents based in different places in the world. There are no printing or posting costs, although, even in traditional RDS, these remain relatively low compared to the costs of incentives. Web-based RDS also solves another limitation of traditional RDS in the case of individuals from stigmatised groups: the need to come to the study site can be an obstacle to their participation (Bengtsson et al. 2012).

Compared to 'traditional' RDS, Web-based RDS also shares some disadvantages, which relate to online research in general. Unlike face-to-face interviews, researchers have no possibility to control who is completing the questionnaire (Wejnert, Heckathorn 2008). The anonymity of participants of Web-based questionnaires has been shown to compromise the integrity of data (Gosling et al. 2004). In the case of RDS, this can be especially problematic as use of a dual incentive structure may encourage individuals from outside the target population to take part in the study. Incentives may also encourage respondents to take part more than once. While it is possible to track IP addresses and to not allow new questionnaires from the same IP address for a second time, IP address are traced to a computer, not an individual, so fraud is still possible. Web-based research also comes with possible biases, as it excludes those in the target population who do not have access to the Internet or whose access is limited (Wejnert, Heckathorn 2008). Researchers therefore need take into account that Internet coverage is not (yet?) total, and that, consequently, some groups (e.g. the poor, undocumented migrants) will not be able to participate in such studies. Additionally, although speed is generally an advantage of Internet-based research, in the case of Web-based RDS, it can be problematic. For example, if recruitment proceeds very fast, researchers might not be able to react in time to sub-groups becoming oversampled.

5.1. The procedure

Web-based RDS draws its main features from RDS, including that it begins with a small group of initial respondents (i.e. 'seeds') who are recruited by the research staff. After completing initial interviews, 'seeds' are invited to recruit further respondents via the Internet (given that web-based RDS is used with populations that are connected electronically, see Wejner, Heckathron 2008). They receive e-coupons to pass on electronically to their peers. All participants are rewarded twice: for completing the interview and for recruiting others to complete it, thus creating the chain-referral system. Sampling is closed when the target sample size is achieved or when the target population is saturated (Heckathron 1997). The referral chain process should be closely monitored so that researchers can modify elements of the methodology that might be malfunctioning, a procedure that is called 'parallel monitoring.' Recruitment that takes place too slowly or too quickly is problematic and should be addressed by modifying the methodology (Montealegre, Röder, Ezzati 2014).

Web-based RDS questionnaires, just as in 'traditional' RDS, must include questions that refer to an estimated size of the respondents' personal network (i.e. how many members of the target population they know) in order to assess sample bias and data weight. It is possible to calculate the probability of selection within a network and known network properties are used to account for clustering effects (Johnston, Sabin 2010). Importantly, as in the case of RDS methodology, Web-based RDS covers both sampling and analysis phases, and both parts of the methodology must be applied in order for a research project to be considered as RDS (Johnston 2014).

Limits on the number of respondents that can be recruited by one individual is also a feature of Web-based RDS (and traditional RDS) that can help overcome some of the biases and difficulties typical of traditional chain-referral sampling. Limiting the number of recruitment e-coupons given to respondents can limit clusters and the risk of a high homophily of the final sample. The strategy reduces biases connected with voluntarism and masking, it also enables researchers to control biases resulting from the fact that members of the population have personal networks of different sizes (Heckathorn 1997, Salganik, Heckathorn 2004). Thanks to limited referrals, chains can be longer, which lessens the final sample dependence on the seeds and the network can be penetrated deeper (Johnston 2014).

Finally, what distinguishes RDS (both face-to-face and web-based) from snowball sampling is that respondents are not asked to identify peers for the investigator, but only to

recruit them, which is less threatening to privacy (Heckathorn 1997). This has particular relevance when research focuses on stigmatised populations (e.g. undocumented migrants) by removing the obstacle of respondents having to provide the researcher with information and contact details of other potential respondents.

5.2. Seeds

Since it is impossible to have a sampling frame of the target population of multiple migrants, the Web-based RDS starts with a limited number of respondents who are part of the target population (this means that the survey is not advertised widely, but rather the link to the questionnaire is sent only to selected seeds). These are initial seeds recruited by the investigators, so the initial sample of seeds is simply a convenience sample. The main selection criterion for the seeds is that they should be diversified with respect to those factors that influence how social ties are formed. This should include basic socio-demographic characteristics (age, race, social status) and geographical dispersion as spatial proximity is connected to the potential for creating social bonds. In our case, Web-based RDS seeds should include multiple migrants, males and females, who are of different ages, have different levels of education, and who are based in a range of destination countries. Initial seeds should be energetic and motivated sociometric stars, meaning that they should be individuals with a broad interpersonal network who are respected by other members of the target population (Wejnert, Heckathorn 2008) and also be virtually networked. Prior knowledge of the target population (e.g. subgroups, models of networking, probable bottlenecks) is therefore very useful (Kubal, Shvab, Wojtynska 2014). The selection of initial seeds is important as it affects the speed of sampling and the time in which an equilibrium can be reached (Heckathorn 2002).

The number of seeds can differ significantly, from one (e.g. Crawford 2014) to seventy (e.g. Truong et al. 2013). The number of seeds should be small enough to promote longer referral chains (so the final sample is less biased by the initial choice of seeds) and large enough to allow for fast recruitment and to decrease the risk of the final sample being dominated by any particular subgroup of the target population (Kubal, et al. 2014).

Kubal et al. (2014) recommend taking several options into consideration in regard to finding and recruiting the seeds in migrant population studies (according to pre-planned characteristics): 1) migrants associations, 2) religious centres, 3) international, non-governmental or religious organisations (e.g. trade unions, the Red Cross or Caritas), 4) places

where migrants spend their free time (e.g. coffee houses owned by migrants, clubs, ethnic food restaurants, colleges, community centers), 5) embassies or consulates, as well as 6) researchers who previously conducted research on the migrant population in question. In the case of Web-based RDS, recruitment of the seeds can also take place online (Bauermeister, Zimmerman, Johns, Glowacki, Stoddard, Volz 2012) and then relevant social media sites and other websites that are frequently visited by migrants in the target population should be identified.

Unlike in snowball sampling, in Web-based RDS it is the survey respondents who drive the recruitment of new respondents. Respondents who take part in the initial interview are given a limited number of recruitment e-coupons (typically 2 or 3) in order to invite their peers to participate in the research. This prevents overrepresentation of respondents recruited by seeds with larger personal networks. Otherwise, the recruitment process could be dominated by one very effective seed, known as a 'super-seed' (Heckathorn 1997).

Because it is respondents who recruit further respondents, the definition of the target population and the recruitment criteria need to be easily understandable to survey participants. Therefore, we need a clear, unambiguous definition of 'multiple migration.' On the side of the investigators, the recruitment process has to be monitored and moderated in order to keep the chain growth at a desired pace and to prevent horizontal growth from dominating the recruitment process. Daily checking of survey data can also help eliminate fraudulent and duplicate cases (Bauermeister et al. 2012). Additionally, researchers may want to contact seeds in order to ask about their experiences in recruitment as well as to collect information about possible ways to motivate respondents to take part in the survey and recruit further (as reported by Baumaeister et al. 2012).

5.3. Incentives

While snowball sampling is based simply on referrals of potential respondents via participants' networks, RDS introduces a dual incentive system. First, respondents are rewarded for taking part in the study (primary reward). Second, they are rewarded for recruiting peers (secondary reward). Extra rewards can be given for recruiting specific subgroups in the target population as a way of 'steering' the recruitment process (Heckathorn 1997).

Research on the incentive system has shown that when social approval is a relevant factor, social control and the need for sanctioning in the group are cheap and dependable

types of ‘secondary incentives’ that are also more effective and efficient (Heckathorn 1990, 1996). Using peer social influence means that compliance costs are external and ‘it is usually easier to tell others to comply than to do so oneself’ (Heckathorn 1997: 177). Also monitoring becomes more efficient when it is peers who mutually monitor each other. Finally, peer pressure also translates into non-material rewards (i.e. peer approval) connected with interpersonal relationships, which the researcher would never be able to provide.

The role of the incentive is crucial: it has to be high enough to motivate all subgroups of the target population; however, if it is too high, it may increase the likelihood of fraud. Researchers should also take into consideration what is culturally appropriate in the target population. Other factors to consider are: the cost of living and the average income in the population, the effort expected from the respondents (cost of their time only in Web-based RDS), legislation (e.g. tax), and ethical guidelines (Tyldum, Rodriguesz, Bjørkhaug, Wojtynska 2014).

Different types of rewards have been used in the Web-based and traditional RDS studies that were conducted so far. They have included monetary rewards (Heckathorn 1997, Ramirez-Valles et al. 2005, Bauermeister et al. 2012, Forrest, Lachowsky, Lal, Cui, Sereda, Raymond, Ogilvie, Roth, Moore, Hogg 2016), in-kind rewards (Strömdahl, Lu, Bengtsson, Liljeros, Thorson 2015, Bengtsson et al. 2012), or mixed rewards (Lachowsky, Lal, Forrest, Card, Cui, Sereda, Rich, Raymond, Roth, Moore, Hogg 2016, Bauermeister et al. 2012). Additionally, in Web-based RDS, rewards can be sent virtually, as for example: VISA e-gift cards (Bauermeister et al. 2012), credit on participants’ SIM cards (Bengtsson et al. 2012), gift certificates for membership to on-line-communities (Strömdahl et al. 2015), or entry into a draw (Lachowsky et al. 2016). While in traditional RDS remuneration is given directly to the interviewee upon completion of the questionnaire, in Web-based RDS the administrator of the survey must be able to collect the respondents’ contact information (usually an email address) in order to get the incentives to respondents. This may seem problematic to survey participants and raises additional ethical concerns about the storage and use of contact details. Additionally, with multi-sited/multinational research projects it is important to remember that monetary incentives can have very different purchasing power in different countries, so it is crucial to highlight the scientific value of the conducted research.

Importantly, not all respondents collect their compensation and other forms of motivations can also play a role, such as the desire to be involved in a new and interesting action in the community/group (Wejnert, Heckathorn 2008). In some cases non-material

rewards have been used, including the possibility to see progression of the recruitment or access to aggregate-data and summary statistics (Stein, Van Steenbergen, Chanyasanha, Tipayamongkholgul, Buskens, van der Heijden, Sabaiwan, Bengtsson, Lu, Thorson, Kretzschmar 2014, Crawford 2014). Another possibility is to give respondents a choice whether they want to receive the reward themselves or give it to a chosen charity organisation (as in Bengtsson et al. 2012) – respondents are then free to decide if they prefer a material or immaterial reward (e.g. the satisfaction of being able to support a chosen charity). If there are no material incentives on offer, it is crucial that participating in the research is an easy and positive experience for respondents (Tyldum et al. 2014).

5.4. Biases

The accuracy of RDS estimates is affected by several factors: recruitment dynamics, the structure of the social network in the target population, and the distribution of traits within the network (Goel, Salganik 2010). Bottlenecks between subpopulations may affect estimates, even if they concern traits that are not directly linked to the source of the bottleneck (Goel, Salganik 2009). Also, RDS weighting methodology relies on the respondents' own declaration of the size of their social networks and it is unclear how easy or difficult it is for respondents to estimate the number of multiple migrants in their personal network. People tend to round numbers to the nearest even increment of 5 or 10, which obviously affects the accuracy of estimates made on the basis of answers from respondents (Mills Johnson, Hickman, Jones, Colijn al. 2014).

Biases typical for Web-based research in general (some of which were mentioned in the previous section) have also to be taken into consideration in the case of Web-based RDS. Wejnert and Heckathorn's (2008) comparison of institutional statistics with Web-based RDS estimation of a population's characteristics based on self-reports from respondents on their networks, shows that the recruitment process in the latter can produce biases. Biases might be due to selective choices made by respondents who recruit their peers or to the level of non-response between different subgroups. In Web-based RDS in particular, patterns of email usage may be key, as subgroups with smaller usage would become underrepresented. Because Web-based RDS depends on the Internet for the recruitment of respondents and the administration of questionnaires, access to the Internet is a factor that can affect representativeness (Bengtsson et al. 2012), for example in terms of the scale of participation of older cohorts or of respondents who are less proficient with the Internet.

5.5. Ethics

Traditionally, use of RDS provoked criticism because it places greater ethical responsibility for the study on respondents (Scott 2008). Specific procedures can (and should) be used in order to safeguard the ethical standards of RDS studies (Lansky, Mastro 2008). Many of these are applicable to both Web-based and traditional RDS, regardless of the specific topic of migration that interests us here.

Incentive systems can raise ethical questions because they 'can be considered as taking a step away from the ideal of free and informed consent in survey research' (Tyldum et al. 2014: 59). Paying respondents to complete questionnaires could lower the quality of responses as internal motivation is replaced by external incentive (Singer et al. 1997 after Singer et al. 1998). However, other research suggests that respondents who are given incentives provide longer open-ended answers and have less missing data (Shettle, Mooney 1999, Singer, Hoewyk, Maher 2000). In any case, it is crucial that respondents understand that the reward is not conditional on their answers but only a payment for their time (Tyldum et al. 2014). In poor and/or stigmatised populations dual incentive systems can lead to various forms of exploitation. In order to gain money, isolated individuals may try to recruit individuals outside their 'real network' (Scott 2008). There is also the risk of individuals who are not part of the target population attempting to 'fake their way in to [the] study' (Scott 2008: 49).

In all cases, in order to obtain informed consent from participants, investigators should clearly describe the study, including information about the benefits and risks, confidentiality, etc. (Lansky, Mastro 2008). In the case of hidden or vulnerable migrant populations, researchers should be prepared for situations when respondents reveal difficult or even illegal circumstances, or directly ask for help. Research staff should be prepared to provide appropriate information and to refer respondents to relevant services (Montealegre, Röder, Ezzati 2014).

6. Conclusion

This working paper outlined some of the difficulties faced by researchers working on multiple migrations and presented Web-based RDS survey methodology as a possible solution to (some of) the challenges discussed. First, multiple migration research has so far been a specific niche within the field of migration studies, perhaps because irrespective of the *mobilities turn*, the research methods that have been used to follow migrations have remained surprisingly static by tracking primarily permanent (or close to permanent) migrations and return moves. Methodological difficulties can be a key reason for the paucity of research on multiple migrations. On the one hand, these difficulties are connected to the fact that multiple migrants are a *hard-to-survey population*. On the other hand, studying multiple migrants requires taking into account various locations, those through which migrants pass and those in which they are based.

In this working paper we argue that a version of RDS carried out online, a Web-based RDS, can be an alternative for studying multiple migrants worldwide. For this population, which uses ICT daily in order to stay in touch with family and friends in other countries, online surveys seem appropriate given the realities of the lived experience. Web-based RDS relies heavily on the assumption that multiple migrants form a virtual network and it draws on this network in its sampling strategy. While other studies (Górny, Napierała 2016) have relied on the network structure of migrant populations, the assumption of a virtual network, as in the case of multiple migrants, is yet to be confirmed.

There are of course specific challenges related to conducting Web-based RDS studies. At the time of writing, relatively few studies employed the Web-based RDS method, which makes them *de facto* methodological experiments. One challenge is defining the target population: there is difficulty in making the target population's definition clear to survey participants. Another is the recruitment procedure: in 'traditional' RDS, a dual incentive system is implemented through the interviewers, but this is not straightforward when surveys are carried out online. Furthermore, incentives have to be virtually transferable and relevant to people in different parts of the globe.

Even with these such difficulties for Web-based RDS in mind, this methodology seems to be important and promising for reaching *hard-to-reach populations* such as multiple migrants. Where standard methods fail, we need to take into consideration new methodologies that effectively enable better insight into the rich world of multiple mobilities.

ANNEX

List of selected Web-based RDS Studies

Source	Topic/Target population	Number of seeds	Sample size	Incentive type	Number of waves reached	Fieldwork duration
Bauermeister et al. 2012	American youth aged 18-28	22	3,426	Primary incentive -$20 (VISA e-gift card) Secondary incentive – $10 (VISA e-gift card) Max paid referrals: 5	n/a	2,5 months
Bengtsson et al. 2012	• men who have sex with men • aged 18+ • living in Vietnam	15	676	Primary incentive – 2.45 USD (50,000 VND) as credit on the participant's SIM, with option of donating the monetary reward to an MSM community organization chosen by the participant + a lottery with the possibility of winning an iPad + text emphasizing participation in order to support MSM in Vietnam + being able to compare one's own answers to those of other Secondary incentive – 2.45 USD (50,000 VND) as credit on the participant's SIM Max paid referrals: 4	24	1 month, 22 days
Truong et al. 2013	• men who have sex with men • traveling internationally • living in San Francisco	70	501	Original methodology: Secondary incentive only – $10 Max paid referrals – 3 Revised methodology: Secondary incentive only – prize raffle for a $500 gift card prize Max paid referrals – 10	13	27 months
Crawford 2014	• marijuana users • aged 18+ • living Oregon	1 super-seed	72	Secondary incentive – the appeal of the study subject matter to prospective respondents, on the basis of the potential political and economic importance of examining their population + live updates and total network referral counts for each respondent were posted on a web site to encourage competition among participants to recruit	5	2 months

Source	Topic/Target population	Number of seeds	Sample size	Incentive type	Number of waves reached	Fieldwork duration
				others + access to near-live aggregate data and summary statistics as the project developed. No limit of paid referrals		
Strömdahl et al. 2015	• men who have sex with men • aged 15+	37	123	Primary incentive – gift certificate for one month of the highest standard of membership at LGBTI Web-community Qruiser ($4) Secondary incentive – gift certificate for one month of the highest standard of membership at LGBTI Web-community Qruiser ($4) Max paid referrals – 10	9	7 months 10 days
Lachowsky et al. 2016	Men who have sex with men	119	600	Primary – CAN $50 equivalent entries into a draw for electronics or travel gift cards (CAN $10/entry) Secondary – CAN $10/ person Max paid referrals – 6	n/a	2 years

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