



What do we know about mixed-device online surveys in the UK?

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We now live in a digital age with a high level of use of technologies in everyday life. The way surveys are conducted is changing. Adoption of technologies including mobile devices for data collection is becoming more widespread across the world. There is a big move in the direction of online data collection in the UK. This includes the plan to collect 75% of household responses to the UK 2021 Census through online data collection.

However, evidence is needed to demonstrate that online data collection strategy will work in the UK and to understand how to make it work effectively. Unfortunately, at present little is known about online data collection in the UK and specifically about the use of mobile devices in online survey data collection. Currently available datasets have very small subsamples, often making statistical modelling difficult and the generalisation of findings impossible. In particular, the use of different devices in data collection is still unexplored and many aspects of survey research and data quality issues are not well understood.

The main aims of our ESRC Secondary Data Analysis Initiative project, "Understanding Survey Response Behaviour in a Digital Age: Mixed-device Online Surveys and Mobile Device Use"¹, are to study participants' online survey choices and behaviour as a social phenomenon and to understand data quality issues associated with this behaviour in mixed-device online surveys in the UK. This project explores differences in a range of devices used by respondents in online surveys (desktops PCs, laptops, tablets and smartphones) with a special focus on mobile devices. We will be asking: Is there a difference in characteristics of people who choose to use different devices? and Is there a variation in data quality depending on device used by participants during survey completion? This project is timely in

addressing the existing gap in knowledge by utilising key UK data resources, which are soon to be available social surveys in the UK with large subsamples responding through online mode including mobile devices. These data will contain large enough samples to conduct advanced statistical modelling.

Results from the study will be compared to findings from other countries such as the Netherlands, Germany, Spain, and the US which have already made advances in this area. The findings from this project will be instrumental to better understand response behaviour in online surveys in the UK more generally and, specifically, in informing best practice for the next UK Census in 2021. The Office for National Statistics UK (ONS), Census Transformation Programme, Central Bureau of Statistics Netherlands (CBS) and Kantar Public (a market research company) will be directly involved as non-academic partners for the project. The ONS is responsible for the 2021 Census in England and Wales and CBS Netherlands has recently started a programme investigating online surveys. Preliminary work has already been conducted by the team using all publicly available UK social surveys which have used an online mode of data collection.

The findings of the project, which starts in February 2018, will be presented at national and international conferences as well as the project's international research symposium which will bring together experts from academic and survey practice institutions. The research findings will also feed into a short course on the use of mobile devices in online surveys provided by the NCRM.

Notes

¹ The Principal Investigator is Olga Maslovskaya, working with Gabriele Durrant and Peter WF Smith (Co-Investigators) from the University of Southampton.

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Diary methods: voyages into the interior

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'Please write as much as you can about what you do, what you talk about, what you eat and drink, what you buy or sell, what you are working on, the places you visit, the people you meet, the things you read, see and hear around you, how you are feeling and, of course, what you yourself think'

Mass Observation Project¹

There's no little irony in the fact that today, (12th May: 'Mass Observation Day') we are writing about Diary Methods for MethodsNews. This annual call for 'day diaries' to capture the everyday lives of people across the UK is a marker of the function of diary methods as a pillar of British social science. Put it in your diary.

However, despite (or perhaps because) of the familiarity of the diary and its strong associations with the written form, recent advances in diary methods remain under-explored within mainstream methods education, with the qualitative gaze trained instead upon the interview, focus group and observation for data collection. Many leading research methods textbooks make little, if any, reference to diary methods. Diary Methods and their regular, private, contemporaneous and time-structured records² are due a revival.

The advent of social media and the associated rise of diaristic (chronological, sequential) media practices, coupled with the boom in mobile technologies and associated affordances for individuals recording their experiences through texts, photos, video, audio and movement have put diary methods at a digital frontier of qualitative research: the imbrication of digital culture in everyday life. Diary methods are uniquely placed for 'capturing life as it is lived'³ and attending to unseen or sensitive subjects, creative practices, embodied experience. Diaries can also offer a way to access particular forms of hard-to-reach data that are simply not available through other methods. Creatively achieving the necessary match of modality and data can lead to rich insights, for example, using photo diaries to trace intimacies of space in the home⁴; using audio diaries to capture 'Narratives of the Night' in a sleep study⁵; or the Hull Floods Project⁶ which recruited a panel of 55 to keep a diary of how the floods affected their lives over a 12-18 month period. Diary studies can also effectively build upon activities people are already



doing. An example is inviting activists with dementia who were already keeping appointment diaries to keep a more detailed record of their campaigning activities⁷. Social components can be introduced through online writing in the form of diary circles⁸ to add support in the process of change and reflection. In these examples, the fit between the research aims and objectives, make diary methods a compelling mode for capturing experience.

There are, of course, challenges to deploying diary methods, and as with any method, it should not be undertaken lightly. Whilst it may appear an attractive method in terms of cost and time resource, with suggestions of fully-formed data generated by participants, there are significant challenges and practical issues to be negotiated and considered. Diary accounts can take several forms⁹. Maintaining participation across a study can be a challenge; respondent fatigue is probably one of the best known limitations of this method, however, just as new technologies have mobilised new modes of data capture, new ways for engaging and sustaining participation have also developed. The use of incentives, diary-writing holidays, researcher progress checks, rewards and writing studios are some of the approaches researchers use to successfully negotiate these issues.

Future Directions

Using digital technologies to make diaries, or elicit reports, necessitates a critical engagement with intersections between social research methods and more technical

disciplines focussed on user experience and accessibility. There is a need to recognise digital divides and how the uneven distribution of 'ubiquitous' technologies can disable, rather than enable participation. Ruptures in connectivity, access to hardware, usability and accessibility, particularly for those who use assistive technologies such as voice-recognition and screen-readers bear consideration. For some people, more traditional audio or 'pen and paper' based diaries will continue to remain the most accessible approach, for others, visual approaches may work better. Flexibility in application is essential. In all cases, attending creatively to the requirements of all participants (not just those we expect) and keeping approaches under revision will be central to ensuring appropriate methods.

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New methods for tracking immediate audience reaction to performances

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When we attend live performances, one important part of the experience is the 'collective engagement' ¹ with others attending the same performance, and feeling and sensing others' silent reactions and overt responses. Most of us have experienced the thrill of being amongst a wildly appreciative audience - whether that appreciation is expressed through cheers and whistles, screaming and dancing along, or through the magical hush at the end where no one wants to spoil the moment by applauding. Most of us have also experienced being amidst a restless audience, whose coughs and fidgets feel like a referendum on the quality of the performance. And there can be the surprising feeling of having reactions that are out of sync with the majority - not finding funny what the rest of the audience is laughing at enthusiastically, or being moved to tears by something that seems to leave others entirely unmoved.

While such anecdotes feel familiar, systematic understanding of the dynamics of audience engagement and reaction is surprisingly limited. When and to what extent are audience members affected by each other's reactions? Are some people affected more than others? How does audience influence vary across performance genres, venues, and kinds of audiences? Which overt behaviours are contagious (whether they were intended as communicative signals or not), under which circumstances and for whom? How much do audience members agree in their assessment of what has happened in the performance, and in their sense of what others' reactions are? How accurately do performers assess audience response?

Answering these kinds of questions is tricky. Directly addressing them has often required intrusive measures that may well disrupt the audience experience: hooking people up to unfamiliar equipment like heart rate sensors or EEG caps, or asking audience members to continuously turn a dial during the performance to report their evaluative reaction. Retrospective reports by audience members have their own problems: they can be far removed from the original audience experience, and the kinds of report that people provide can be vague and not specific to particular performances.

New technologies and methods are opening new possibilities for investigating audience reactions to live performances in real-time

and in non-intrusive ways. Advances in computer vision have provided new tools for tracking visible audience responses in live performance situations: automated processing of facially displayed emotion, gaze direction, and body movements, based on external HD video. We have exploited such tools in our studies of the social dynamics of live audiences ranging from stand-up comedy² to contemporary dance³. We have also developed new tools for combining and simultaneously visualizing multiple fine-grained data streams - e.g., facial expression, breathing and movement - from the perspective of any audience member or the performer^{4,5}.

It is also now possible to unobtrusively collect audience members' self-reports about their experience - their characterizations of the performance, their judgments of peak moments - immediately afterwards using their own mobile devices, before they have even left their seats. This is in principle no different than passing out paper and pencil questionnaires, but the speed and ease of deployment is greater, and people may feel particularly willing to disclose private thoughts and reactions on devices they regularly use to do just that⁶. Further, it is possible to measure, immediately or later, the extent to which they agree with others' characterizations. With such tools, researchers can develop new kinds of profiles of audience members' connectedness in particular performances: the extent to which audience members with different backgrounds and genre-specific expertise, or with different spatial proximity and prior connection with other audience members, agree with each other's patterns of interpretation and evaluation⁷.

As we see it, the next methodological opportunity and challenge will be to integrate these different streams of data—audience members' visible behaviours, self-generated characterizations of the performance, and extent of agreement with each other's characterizations—so as to create new ways of understanding audience interaction and influence.

Symposium that focuses on these methodological challenges and opportunities will be held on Friday July 14th, 1pm-4pm at the Digital Catapult, 101 Euston Road, London.

Resources

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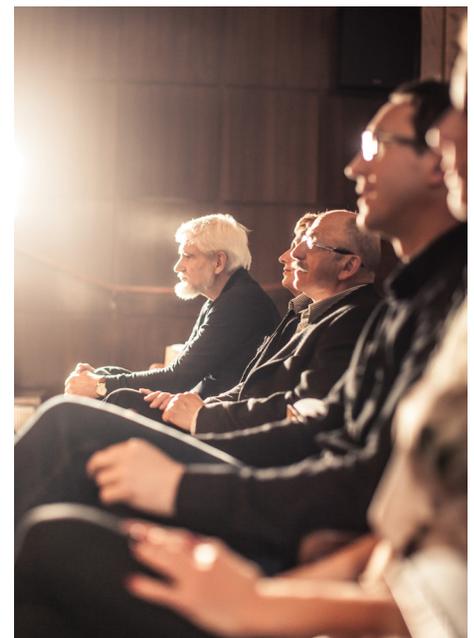
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Complex social survey data designs

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Social scientists now have unprecedented access to data. New social science data resources are increasingly becoming available including new forms of 'found' data¹, such as administrative data² and various forms of 'big data'. The richest and most research-valuable data resources available to social science researchers are large scale multipurpose social surveys, such as *Understanding Society* and the *British Cohort Studies*.

A feature of modern social surveys is that their designs are complex³. Large scale surveys generally do not collect data from simple random samples. This is partly due to the constraints of fieldwork, for example costs and logistic problems are reduced if households or individuals are sampled from within smaller areas (i.e. primary sampling units or clusters). To ensure that certain smaller geographical areas (e.g. the devolved territories in the UK) have sufficient sample sizes to support independent analyses, the survey may over-sample these areas. Similarly, groups that tend to have low coverage in national samples (e.g. individuals living in poverty or ethnic minority groups) may also be over-sampled to provide enough cases for focussed independent analyses to be undertaken. These samples are often referred to as booster samples.

When analysing complex social surveys researchers will need take the design elements of the data into account, or their results will not represent the patterns found in the wider population. These adjustments can be undertaken in statistical data analysis programmes such as SPSS (i.e. the complex samples package), Stata (i.e. svy commands), or R (i.e. survey package). The analysis of complex survey samples is not always straightforward, however. There are some data analysis techniques that do not readily support adjustments for complex survey designs and some statistical measures cannot easily be calculated.

In most large scale social surveys the respondents have unequal chances of being selected or have unequal chances of providing data. Therefore most contemporary large-scale social

survey datasets come supplied with weights. The purpose of these weights is to allow researchers to adjust the data in some way, usually to better represent a target population⁴.

The respected and highly experienced data analysts Angrist and Pischke⁵ assert that 'few things are as confusing to applied researchers as the role of sample weights.' Gelman⁶ makes the bold assertion that 'survey weighting is a mess', because it is not always clear how to use weights in estimating anything other than simple descriptive statistics. We concur that there is little in the way of a clear prescription on when and how best to use weights in empirical analyses, and advice differs within the technical literature. The statistical literature on survey design, sampling and weighting is dense and the terminology and concepts that are used are often confusing for applied social science researchers. An aim of our ongoing work is to make these prescriptions more accessible⁷.

Using simpler standard data analysis techniques that fail to account for the complexity of surveys is a naive approach. In some analyses a survey design and selection strategy may be ignorable and a naive approach to data analysis will be satisfactory, however making this assumption a priori is at best speculative and at worst may result in misleading inferences. Our advice is that researchers should take this issue seriously and begin by studying the design and selection strategies used to collect the data. Researchers should be open about their analytical decisions, and the choices that are made to operationalize the analyses. Whenever possible researchers should compare results that attempt to take into account the complex survey designs and selection strategies with more naive analyses, and reflect upon whether or not the survey design is ignorable. The research process should be fully documented. This is often infeasible within the confines of a standard journal article, but through sharing code and the use of repositories, researchers can ensure that their analysis of complex survey data is transparent and reproducible⁸.

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Researching approaches for education in the digital age: digital tethering and digital métissage

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Researching education in the digital age arguably has become both more complex and more exciting in terms of the issues that need to be considered and the range of possibilities available. Today young people, small children and older adults are all using the internet and digital technologies in diverse ways and for different needs. In terms of research in education, the issues about what counts as learning, who decides this, and how it is changing and moving are also areas that bear consideration in the digital age. Two key issues in terms how we understand and implement research approaches are, the way in which technology is used (digital tethering) and the use of new methods for linking the arts, social sciences and the digital, one example of which is digital métissage.

Digital tethering is defined as both a way of being and a set of practices that are associated with it. To be digitally tethered would generally be associated with carrying, wearing or holding a device that enables one to be constantly and continually in touch with digital media of whatever kind¹. Practices associated with digital tethering include the practice of being 'always on'; 'always engaged': texting at dinner, or driving illegally while 'Facebooking on the phone'. With the increasing use of technology across home, work and school, most of us are digitally tethered, but few links have been made as to how this affects the research approaches we use. Thus there are questions to be asked about the value and impact of digital tethering on research approaches and it is vital that researchers, in whatever context, consider its impact.

In terms of undertaking research it is vital to understand that what we are dealing with is different ways/forms of 'reading' and 'interrogating' that we have not yet come to understand, as well as different ways of being and managing left behind identities. The use of technology is already a culturally embedded practice, even if its impact on higher education is not entirely understood. For example, there is a sense that participatory culture characterised by the use of Facebook and YouTube prompts or encourages the democratization of media production, bringing with it the suggestion that young people are not only central to the digital age, but key players in its formulation and (re) creation. What



appears to be important is to understand how students live and learn across the many digital media available to them and what is new, changed, or changing about how they live and learn today, and what evidence there is for these shifts.

Digital métissage is a research method, often used in biographical and narrative approaches to research. It is based on the idea of literary métissage². Literary métissage is the process of creating stories that are braided together and rooted in history and memory, as well as being stories of be-coming. Literary métissage provokes engagement with dominant discourse(s) in order to challenge and change them. Digital métissage captures the idea of blurring genres, texts, histories and stories in digital formats that recognise the value and spaces between and across cultures, generations and representational forms. The notion of métissage (French meaning hybridisation or fusion) brings with it the sense of braiding, so that the process of digital métissage requires co-production and co-creation with participants in ways that braid data and stories. Through collecting stories, researchers and participants undertake digital braiding so the data and representation are both individual and collective. Such métissage is a method that enables researchers to work in innovative participatory ways that enable the creation and illustration of visual and emotional aspects of the stories, artefacts and research. The focus on 'the digital' also recognises the importance of connectivity as a complex and contested concept.

Notions of curriculum, language, culture, place and identity are explored: 'Place and space, memory and history, ancestry and mixed race, language and literacy, familiar

and strange are braided with strands of tradition, ambiguity, becoming, (re)creation, and renewal'³. Poetry, pictures, storytelling and narrative and mixed and braided genres are used. The linked examples in this text also illustrate how this can be transferred into digital forms online.

Thus when considering researching approaches for education in the digital age digital tethering is important in to understand how people live and learn across the many digital media available to them, what is new, changed, or changing about how they live and learn today, and what evidence there is for these shifts. Digital métissage offers opportunities to both explore, challenge and disrupt the status quo and ask questions about what is meant by 'the digital', what is meant by 'research', and what is meant by 'education'.

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- Research Methods for Education in the Digital Age* by Maggi Savin-Baden and Gemma Tombs has just been published by Bloomsbury Academic.

Missing biomarkers in biosocial data

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A number of survey based studies, e.g. Understanding Society, English Longitudinal Study of Ageing, now collect biological samples from the blood, hair, saliva, teeth, nails and urine of their respondents. However, not all survey respondents are willing or able to provide such samples. For example, in wave 2 of the English Longitudinal Study of Ageing, of 8,780 eligible participants only 7,666 (87%) took part in the nurse visit, and a valid blood biomarker was obtained for only 5,899 participants (67%). In wave 2 of Understanding Society, of 35,937 eligible participants only 13,107 (36.5 %) provided a valid blood biomarker, but this low percentage is also caused by sub-sampling participants for the nurse visit.

Given the high proportion of missing biomarker data, it becomes particularly important to investigate the reasons for missing biomarker data (missingness mechanisms) and to account for the missing data in statistical analysis, for example through inverse propensity weighting, multiple imputation and selection models.

One of the strengths of survey data is the detailed information on those participants who take part in either the interview or questionnaire based components. Usefully, it is now standard for assessors (usually nurses) to record reasons for missing biological samples. These data on reasons inform analyses of biosocial data as we illustrate here. We use data from wave 6 of the English Longitudinal Study of Ageing (ELSA). At wave 6, hair samples were collected for the first time. From these hair samples, hair analytes such as cortisol were processed. Hair cortisol is an integrated measure of Hypothalamic-Pituitary-Axis (HPA) axis activity, with higher levels indicating higher physiological stress responses. Around 2 cm of hair was collected, which is indicative of stress levels over the last 2-3 months. There are considerable amounts of missing hair cortisol data. Of 7,419 ELSA participants in the nurse data collection, there were only 2,558 participants with hair cortisol data. This is partly because some people were ineligible for the data collection (having less than 2 cm of hair). Others refused to give hair samples, mainly for reasons related to appearance. And funding constraints meant that only a subset of the hair samples could be processed to produce hair cortisol data.

As baldness predominantly affects men, we

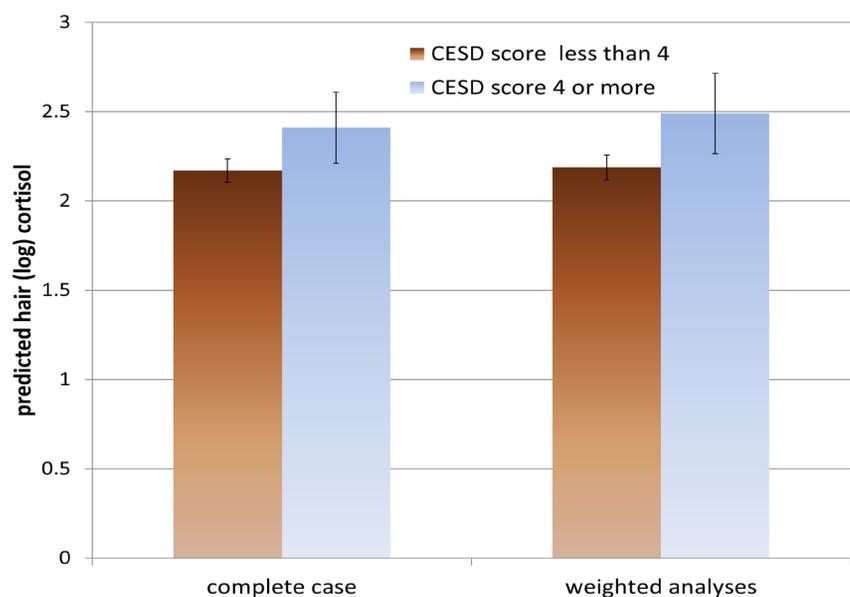
may expect gender to be associated with having hair cortisol data. Furthermore, given the association of ageing with hair loss, we may expect younger participants to be more likely to have hair cortisol data. Also, given the importance of appearance to some participants, it is likely that having a negative self-image is linked to missing hair cortisol data. As the ELSA survey asks detailed questions related to depressive symptoms (the CESD questionnaire), we can examine to what extent these survey questions predict having hair cortisol data. As stress and depression are interlinked, depressive symptoms may predict both missing hair cortisol data as well as higher levels of hair cortisol.

We explored these predictors of having hair cortisol data in the ELSA dataset. Overall, there was an pattern of men being less likely to have hair cortisol data compared to women, except in the youngest age group (50-59) where both men and women had low probabilities (around 0.2) of having hair cortisol data. We also saw that depressed participants (who scored 4 or more on the CESD questionnaire) had a 7% lower probability of having hair cortisol data compared to non-depressed participants.

We used these three variables (depressive symptoms and the interaction between age and gender) in a logistic regression model to predict missingness and derived weights for missing hair cortisol data based on inverse probability weights from this response model. We then applied these weights to the regression model predicting (log) cortisol with depression as the explanatory variable

and compared these estimates to the complete case analyses where no weights are used, but accounting for the design of the survey in both cases with respect to clustering and stratification. We see that although both the complete case and weighted analyses show similar patterns, the association of depression with (log) cortisol is stronger in the weighted analyses. When the log cortisol estimates are exponentiated, there is a difference of 2.38 pg/mg in cortisol estimates from the complete case vs weighted analyses. This suggests that the association between depression and cortisol is under-estimated in the complete case analysis, possibly because there are fewer depressed people who are willing to give a hair sample.

There are many caveats to this analysis. The model of missingness would normally include many more predictors and it also does not take into account the other complexities of missing ELSA data at wave 6 such as survey weights for the nurse visit. But the main point is the richness of the survey data which allows us to discover factors that are both correlated with the missingness mechanism as well as our outcome of interest. Our inference based on complete case analyses may be biased if we don't take account of such factors. Researchers using biosocial datasets should investigate the reasons behind missing biological data using the rich survey data to discover the missingness mechanisms and incorporate such information in their methods to deal with missing data.



Talking to autistic students in transition: collages, card sorts and walking interviews

Jacqui Shepherd, University of Sussex

This ESRC-funded PhD research sought to understand the lived experience of young people with autism as they left special school to join mainstream colleges of further education at the age of 16 or 17. I was concerned to privilege the point of view of the young people with autism and for this reason, a creative approach to developing a more 'interrupted interview' was designed¹. By using a combination of visual methods, tablet applications and walking interviews², different ways of engaging young people in the interview process were employed and allowed for a richer conversation.

Disability rights, the social model of disability and autism self-advocacy all lead us to consider carefully the representation of autistic views when we conduct research; this is coupled with an ethical imperative to examine our own methods. All the activities used to generate data had another purpose of helping to readjust the power relationship between the researcher and participant by sharing the process more with the participants themselves. Handing over the tablet to order the card sorts, to arrange the collage and to take photos all contributed to this changing relationship to the point where, in the walking interview, the participant was literally leading the researcher around unfamiliar territory.

Using collages to capture capabilities

By harnessing the likely inherent interest and skills of many young people with technological devices and using visually mediated methods to strengthen the communication of young people with autism³, a collage application was used on a tablet. This held some preloaded images of typical subjects studied at school and participants were invited to enlarge or shrink the images according to their interest in them. They were also encouraged to add their own choices through words or images either within or outside school. This resulted in a positive representation of the participant from the outset moving away from the deficit or medical model of autism.



Using card sorts to organise thoughts

Continuing the use of tablet devices and apps, the next activity led into a discussion about the impending transition to college and how the participants were feeling about it. Rather than try to discuss these feelings in a completely open-ended way, which could be problematic for anyone trying to imagine a future but for people with autism can be more so, pre-loaded cards were presented on the tablet. The first list covered suggestions about what they might be looking forward to at college and allowed us to discuss these things while the participant put the cards in a rank order. Similarly we repeated the exercise with concerns they might have about making the transition to college. Participants could also add to this list or delete items from it.

Conducting walking interviews to experience inclusion

Follow up interviews took place once the students had been at college for a term and I handed over the tablet to each participant to take photos of places they were taught or socialised in at college and if there were particular places they liked or avoided. This facilitated another useful discussion, minimising the need for eye contact or body language interpretation, and also handed over not only the symbolic power of the

tablet and taking photographs but also the physical direction of the interview. By exploring their varied exposure to different parts of college a further dimension to the interview was added as well as easing the interview process itself. For example, one student was only taught in one corridor of a large further education college and was not allowed to go anywhere unsupervised by his learning assistant, whereas another was able to attend lessons and social spaces across the campus. By sharing their embodied experience of being (a)part of college and of their inclusion/exclusion within it, the research was able to draw on a further dimension of student experience.

There are clearly limitations to these methods, perhaps the most obvious one of restricting or forcing choices through the collages and card sorts; only the most articulate participants added their own ideas. However, by scaffolding responses, the research was able to gather a broader range of voices, not just the more articulate autistic voices, and to hear those that may have been missed without that support. Challenging ourselves to think creatively about traditional qualitative methods helps us to listen to a wider range of autistic voices and deepens our understanding as we walk alongside them on their varied and unique journeys.

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NCRM training and events



Methodological Considerations in Biosocial Research Using Understanding Society Data, 16 June 2017, Southampton

Time Series Analysis for Political and Social Data, 20 – 21 June 2017, Southampton

Oxford NCRM Summer School: an Introduction to Combining Social Science and Molecular Genetic Research, 26 – 30 June 2017, Oxford

Applied GIS for Social Science Applications, 27 – 28 June 2017, Edinburgh

Big Data Analysis for Social Scientists, 6 July 2017, Edinburgh

Managing Danger in Oral Historical Fieldwork, 6 September 2017, Edinburgh

Thinking with Ethics in and Beyond the Field, 7 September 2017, Brighton

Applied Multilevel Modelling, 13 – 15 September 2017, Southampton

Introduction to Spatial Analysis for Researchers, 4 – 5 October 2017, Southampton

Spatial Interaction Modelling, 19 – 20 October 2017, Manchester

Creative Approaches to Qualitative Researching, 13 – 14 November 2017, Manchester

Introduction to Latent Class Analysis, 16 – 17 November 2017, Southampton

Advances in Diary Method for Qualitative Researchers, 1 December 2017, Cardiff

Web Survey Paradata, 7 December 2017, Cardiff

Designing and Implementing Mobile Web Surveys, 8 December 2017, Cardiff

ABOUT NCRM

The ESRC National Centre for Research Methods (NCRM) is a network of research groups, each conducting research and training in an area of social science research methods.

NCRM brings together researchers from across the UK with a wide range of research methods expertise, at the frontiers of developments in research methodology.

NCRM disseminates innovations and developments in research methods through training courses and events and through other direct engagement with researchers, but also by cooperating with other organisations and initiatives with an interest in social science research methods.

NCRM was established in 2004 as part of the Economic and Social Research Council's (ESRC) strategy to improve the standards of research methods across the UK social science community. NCRM acts as a strategic focal point for developments in research, training and capacity building related to research methods, both at the national level and cutting across social science disciplines.

For more information about the NCRM and its activities please see our website www.ncrm.ac.uk

MethodsNews is published three times a year by the National Centre for Research Methods.
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