When Methods Meet:
Big Data and Action Research

Jo Ferrie and David McArthur, both University of Glasgow, in conversation.

In this 15-minute film David Macarthur and Jo Ferrie discover a surprising degree of common ground between a very new group of methods relating to research using 'big data' and action research which has been in existence for several decades. To begin with, both face challenges over definitions. There are many different ways in which research using 'big data' is understood, with some emphasising the different forms of data (such as Twitter data) that have recently become available, while others highlight machine learning or some other aspect of methodological innovation. In a similar way there are various definitions of action research, with different emphases placed on working with partners outside of academia and action being oriented to bring about social change. At the outset of action research it is often unclear where the process will lead, what types of data will be produced and how they will be usable in pursuit of a social justice agenda. The character of 'big data' as naturally-occurring data that may be available in real time also gives the analysis a potentially unpredictable quality, and the possibilities that are opened up by big data for more people to become involved in social science fits well with the philosophy of inclusivity that is central to action research. Both approaches appeal to the idea of 'citizen social science'. This does bring challenges, such as the need for extensive negotiations with various stakeholders in the research that is undertaken and the types of outputs that it is intended to produce, which will not necessarily be conventional academic outputs. Both approaches also generate interesting debates about data ownership, and also about the effects on researchers of being close to the issues being researched, many of which will have a direct policy relevance, as well as being close to the human dimension of a topic.

Transcript of conversation:

DM Some of the definitions have just said well data is data, big data is just there is more of it, and these sorts of explanations of what big data is tend to just focus on it's the technology we have to use. So if we can't analyse it on a desktop computer, then it's big data. Some explanations even say if you can't open it in Microsoft Excel then we might call it big data. So there is a class of explanations that focus on the technical infrastructure.

The others go into the data generating process, so big data can be any data which is a new and novel form or an emerging form of data where the data would be generated automatically. We wouldn't be designing it or controlling for those sorts of things, we would usually be interested in in a study.

The other explanations become more methodological. So it's where we are not using our standard classical statistics models to do the analysis. Maybe we are thinking of using things like machine learning or database procedures to analyse it. So the explanations have kind of straddled across the equipment, the data generating and collection process and the methodological aspect.

So no one seems to have agreed quite yet what big data means, particularly in the social sciences.

JF I think there are some parallels with the kind of research I do which I am going to talk more today about action research. It can also have lots of definitions but I think the simplest definition is that it's action orientated. So we work with partners outside of academia. With stakeholders out in the real world, where they want to use this research to deliver a particular knowledge base for them to then lobby for social change.

We are very much at the mercy of who wants to work with us. What are the big social justice challenges of this time and where can we develop resources to do that work. Which makes it quite exciting. But I think that lack of control, not knowing quite what the data is going to look like and therefore problem solving as you are producing data as you are making meaning from that data. And as you are producing, a product that is useable in that social justice field. That really motivates me; I enjoy that kind of work.

So what can you find from big data though that makes it a distinct and worthwhile method?

DM There has been a lot of hope that we can do wonderful things with it. We are swimming in data, there is always data around us and we can analyse it and find out things. I am not sure at the moment we've had the demonstration of what can big data do that no other method has been able to do.

So we can look at Twitter data to see what people in Glasgow are tweeting about right now. What are the topics that seem to concern them? Maybe that then generates well why are people talking about this one thing. Or why are people in this part of the city mainly using negative types of words in their tweets. So the big data maybe doesn't give us very much information about well are people there unhappy, why are they unhappy, what might we do about it. But it can be quite a useful way of potentially generating research questions.

The good thing about a lot of the big data is that it is naturally occurring, so it's been collected anyway. One of the things we are using at the moment is data from the Strava app, so if you are a keen cyclist you will have perhaps used it. The benefit there is that there is really very little data available on what cyclists do. So the cheapness, the availability and perhaps there isn't anything else to work with I think are some of the key advantages.

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JF One of my main preoccupations in being an academic and doing research and teaching research methods, is developing a responsibility within our students of social change. That this amazing intellect that they come to the university with and this career that they can build around using research, they should be using it to change the world and make it a better place. This is inbuilt into sociologists as part of our mission and research methods is for me central to that.

Action research is public social science. It's about taking the skills that we have here in our ivory towers and not just making them accessible to the public, to stakeholders, to real people, but to also demonstrating the value of those skills. And again that is something that I find really motivating. It's really challenging but it's really motivating. And so one of the things that we are able to do, using action approaches is to demonstrate impact. Is to be able to say an academic was here. And this is what we did. This is how we enhanced this team.

DM I think big data gives a chance for people to participate more in research. I am working on a travel planning app. One of the things it does it sits on people's phones and reports information about where they are, where they are travelling to and what mode of transport they are using. The idea is that this gets fed back to us, we then can process the data and this can go onto lead to improvements in cities, improvements in air quality, improvements in journey time, public transport and so on. So it gives an opportunity for people to participate in it. They can offer up their data as part of the research effort. It's certainly more light touch participation perhaps than what you are talking about. There is the risk it can be one way so they carry the sensor and it reports to us and then we take the data and run off. But ideally we want to deliver things which are of benefit to them and for them to sort of see the benefit.

So one of the things with the app we are working on, is that the data goes to planners to try and improve the city. So over the long term we certainly hope we see the city gets better, but that's a little bit vague perhaps. So one other thing that happens is we process the data in real time. Or we will eventually. And it will feed back important journey information to them.

The other aspect, we can put it under the big data umbrella, is this increasing citizen science of which you might see the sort of projects which have people looking at photographs from space telescopes to identify galaxies. So you get some instructions and then you look through these images and you classify things you see on the screen. And this goes straight into academic research projects and people can monitor through blogs and the website and social media, what is this collective effort achieving. What are we discovering based on their participation, so they can become part of the research team even if it is a very large team. They can be participating in the data analysis and so on. So it offers us some new opportunities for connecting with people perhaps and drawing them into the process. And hopefully driving this positive change in the world and that they feel they can be part of it.

JF A lot of our participants are already active. In active and more passive senses, so one example of action research I was involved in recently was research funded by the Motor Neurone Disease Association Scotland, where they asked us to find out what it was like to live with motor neurone disease. So they asked us to follow twenty families, over around a year to see how the condition progressed. And this is a very brutal condition. So around half of those families we would lose the person who had motor neurone disease. And we actually had such a response from participants. Forty families wanted to be involved. To be recognised and they wanted that collected. So we just doubled the size of the study and didn't increase the size of the resources but that was fine. It was important to hear these voices. But as a result of having this incredible series of data that informed the charity about

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what the key barriers were. They were able to campaign to the NHS, to double the number of specialist care nurses working in Scotland. And have the funding for that taken on by the NHS rather than by the charity. But I suppose there is a tension there for me as an academic because my institution wants me to have impact of course, but it isn't so interested in that product that I produced. It wants me to have journal articles.

DM One of my colleagues is developing an index of public transport availability. So a lot of policy maybe done by saying this person has a bus stop near them therefore they have access to public transport. They can get a job because the bus stops there. What it doesn't tell you as well is there is two busses a day that goes to the bus stop or is there one every ten minutes? And does it let them get to where the jobs are. Does the bus run at the times when the jobs are. So he is working on producing this data set which is potentially very useful for analysis. But the output of this data set is not particularly counted in academia. It's not really seen as the kind of high value output. Even though this may then go on to get used by other researchers and organisations to make important policy changes. So we have the same kind of issues I think in terms of what is counted as a valuable output.

JF For the motor neurone disease project I went and met with families up to three or four times so that we could negotiate what an outcome would look like for them and obviously met with the charity a lot to see what they would value as change and kept negotiating that and reflecting and negotiating that. So from the start of thinking about where you are going to invest your time in doing research, you are identifying the stakeholders. And then you build networks of stakeholders which makes it easier to do action research as you move on in your academic career.

Do you guys use stakeholders?

DM We talk a lot about data owners. So we may identify some wonderful data sets. We may identify wonderful things we can do with them. But having the group of people that own the data and that are willing to give it to you. And on terms which allow you to do the research that you want to do is a big challenge. We certainly spend a lot of time networking and trying to build networks with stakeholders or data owners to try and get access to the sorts of data that we need or want.

We have to be careful to remember that data, big data, any data is about human beings and we have to respect that.

Sometimes I am quite happy that even though I may be involved in the research participants there is a level of distance there. I wonder how you experience being up close with the research participants and what it takes, does it require a thicker skin?

JF It's really challenging and it's, this is the first year where I've actively taught students about the emotional aspect of doing research because it's something that has changed me as a person. I am going to use again the example of the motor neurone disease work. Of the forty families I visited. There were five or six that I really got close to. And if you are going to be doing sensitive research, emotional research, do it in the morning, clear the afternoon. Use that time, set up peer relationships, I had some great colleagues who I could talk to about it but anonymity becomes a problem there. And we need to look at this in more depth with more responsibility because the people that can do this are not the people with the thick skin. They are the people with the thin skin because they are the most empathetic. They are the ones that can make emotional spaces where meaning can be constructed. And that is so important. Because if you lose the emotionality of what people were saying, you are losing

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half of the data. The data isn't in the words, the data, it's much more 3D than that. So it's exhausting doing this research.

DM And it's probably the sort of thing no matter how much you try to explain to someone I expect until you experience it you don't,

JF That shift in yourself, you go from thinking intellectually about the stakeholders and the action identified, to start feeling it. You are aware of people, social barriers. I mean there was one family I remember who lived in a first floor flat who got told that they wouldn't get a stair lift, an adaptation to their homes because the person with MND would have died before that investment was seen as valid to the local authority. So the husband fire-lifted his partner up to the first floor flat. And this was witnessed by his two children. And so I became so emotionally committed to the actions. It became my fight. And that is a privilege. And the reward of hitting that action was euphoric. As soon as you recognise that somebody is human in the data,

DM Yes, because even in these databases I know if you pulled up one individual's time line you see all of the services they got, their activities of daily living scores and their hospital admissions and you can see deteriorating health. When you are really humanise it, it does become closer to the qualitative experience. But I have found that when you work with the people who own the data on questions that they are directly interested on, that's usually where I've seen the greatest impact out of research because they really want to know what you can extract from the data. What you can find out from the data. And they want to implement what they find. So I've experienced that.

JF I think especially at the policy maker level, they are looking for two things, first of all it's the statistic to say why this has to matter to them as a problem. How many people are affected, or what are the budget consequences. It's the number that convinces them to read the next line. And then if the next line is a qualitative emotion-led statement then you've given them the reason to change.

So in my experience you absolutely need both.

DM No I can agree, it definitely adds the human dimension or emphasises the human dimension which is behind the process of maybe millions or billions of data points. But we are human beings and stories are powerful for us. So it not being given out of context is important I think.

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References and further reading:

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Mark Birkin's presentation on 'what is big data?' at the 2016 Research Methods Festival can be accessed at https://www.youtube.com/watch?v=X-Z5gteBYSA

Suggested questions for seminar discussion:

Why is 'big data' so hard to define to everyone's satisfaction?

Is action research easier to define by virtue of having been in existence for longer?

How do big data research and action research compare in terms of their potential to involve ordinary citizens in research?

How do they compare in terms of the ethical issues that they raise?

How might the analysis of big data be used in an action research project to drive social change? Does research involving 'small data' have a future?

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