

Participant Information Sheet

HomeSense: digital sensors for social research

Kristrún Gunnarsdóttir, Jie Jiang and Riccardo Pozza are research fellows at the University of Surrey. We are inviting you to take part in a trial of new methods to study everyday life in households. Before you decide if you want to take part, please read carefully this information sheet. It tells you what this project is about and what you can expect by taking part.

- **What is the purpose of the study?**
- **Why have I been invited to take part in the study?**
- **Do I have to take part?**
- **What will happen if I take part?**
- **What will I have to do?**
 - *Walking interview and questionnaire*
 - *Living with sensors*
 - *Time use diary*
 - *Final interview and questionnaire*
- **What are the possible disadvantages or risks of taking part?**
- **What are the possible benefits of taking part?**
- **What happens when the research study stops?**
- **What if there is a problem?**
- **Will my taking part in the study be kept confidential?**
- **Who is organising and funding the research?**
- **Who has reviewed the project?**

What is the purpose of the study?

The HomeSense team is developing ways to use sensors in social research, and is trialling data collection and visualization techniques in UK households to establish how everyday life can be observed and studied with this type of measuring.

We will be demonstrating how the sensor-generated data can help describe household activities, along with data collected from interviews, questionnaires and time use diaries. We will document the ethical and technical issues that arise, demonstrate how consent, privacy and data security are affected, and examine the burden on participants. From this we will build a package of training resources for social researchers.

Why have I been invited to take part in the study?

You have been invited to take part in this study because you responded to our advertisement or you came forward at one of our outreach and networking activities in which we were promoting HomeSense and recruiting participants. You must be a household occupant living in south-east England, and living in one of three household types: 1. of one occupant; 2 of two or more adult occupants; or, 3) of parent(s) w/dependent(s) 0-16yrs. If you have one or more persons living with you, we ask that you share with them this information sheet and relevant consent form, and seek their permission to make decisions for this study as the key respondent on behalf of your household.

Do I have to take part?

It is entirely up to you to decide whether or not you want to take part. Should you decide to go ahead, you are still free to withdraw at any time up until one month after the end of the trial. **You can contact us by email (k.gunnarsdottir@surrey.ac.uk) or phone (07901 595430)**, and no questions will be asked as to your reasons to withdraw. If sensors have already been installed in your residence at a time when you and other household members no longer wish to participate, we will make an appointment at your earliest convenience to remove them. Once sensors have been installed, you will also be able to turn them off at any time should you, other members of your household or your guests prefer to do so.

In the event that your household withdraws from the study, we will need to know what you want us to do with the data that are already collected up until your withdrawal. You are free to request that the data are destroyed, otherwise, the participants' consent to use the research data will apply, as outlined in this document and on the consent forms.

What will happen if I take part?

If you choose to participate, you become the key respondent on behalf of your household and in agreement with other household members. This information sheet is yours to keep along with copies for other household members, visitors and house guests. We ask you to sign a consent form as the key respondent and we ask that all other household members, visitors and house guests (16 years and older) sign separate consent forms to acknowledge their understanding of the nature and purpose of the study. Visitors and house guests should first read the information prepared for them (see attached). They are free to request that the sensors are turned off during their stay or their children's. Otherwise, we ask that they read this document and consent to being indirect participants (also on behalf of their visiting children). Finally, we ask that children in your household younger than 16 are involved if their age is appropriate, by giving them the opportunity to learn about what the sensors can capture of daily life (see *Living with sensors*) so they can assent or decline in the presence of the researchers. Parents/guardians of child(ren) living in your household or visiting, can decide whether or not their child is mature enough to consent.

At each step of the study, you will have opportunities to ask questions, raise concerns and change your mind about participating. At the beginning of the trial, the researchers will ask for basic demographic information about the household and various aspects of everyday household practice. Live sensors will be demonstrated to your household before everyone concerned agrees that fixed sensors can be installed for 10 weeks (see *Living with sensors*). As the key respondent, you will also be asked to wear a wristband activity sensor and to keep a diary of your time use over four consecutive days of your own choosing. A second member of your household (if there is one) will also be offered an activity sensor to wear. At the completion of the trial, the researchers will ask for your thoughts and comments about the experience of participating.

For your efforts you will be compensated with a total of £100 and all other consenting members of your household will be compensated £25 each. The activity sensor(s) will be yours to keep.

What will I have to do?

Subject to all other members of your household consenting to participate and agreeing that you are the key respondent, you can give your own consent to participate, however, we ask for confirmation of everyone's consent and for the assent of children at a time when we can demonstrate a set of working sensors to your household. You take responsibility for the researchers' access to your household to install sensors and collect data, and for communicating decisions with the researchers on behalf of the household. You also take responsibility for informing your visitors and house guests about the trial.

Walking interview and questionnaire

You will first be asked to agree on an appointment at a convenient time so that the researchers can demonstrate the sensors to your household (*show-and-tell*). A sensor suite (see **Part 2**) will be set up for you and other household members to play with and see for yourselves what the data look like. The EGG captures temperature, humidity, light and noise levels (no actual sound recording), someone or something coming in and out of range and the density of particulates in the air. The electricity monitors capture electricity use on chosen outlets, and the wristband activity sensor collects so-called steps, but an EGG can also detect activity sensors in its vicinity. All these measures can be played with to see immediately the results on a screen (turn on a hair dryer, walk around, move the EGG around, turn on music, clap hands, and so on), and to have a conversation about the activities that could be seen/interpreted from the data, including personal and potentially sensitive information.

This can be quite an entertaining exercise but, more importantly, it is of immense value to the researchers to have a clear idea of how well you and other members of your household understand the capability of this

technology, and to discuss openly with everyone concerned what they find acceptable and what raises questions and concerns. This will also give everyone concerned a good idea of when they might want to turn off one or more sensors.

Following this demonstration, we ask you to take a walking interview at your residence. The interview will last up to 30 minutes, followed by a questionnaire that will take approximately 10 additional minutes to complete before the researcher leaves your residence. Upon your permission to proceed, the researcher will first reiterate how the interview is organised. This will allow you the chance to ask questions and raise concerns, e.g., if you wish to omit certain areas/rooms. You will then be asked to guide the researcher through your residence. In each room you will be asked to describe how that room is used by you, who else (if anyone) uses the room, what kind of activities and interactions take place, including the use of equipment such as TV / entertainment, computer, washing machine, Hoover, cooker / oven, etc.

During the tour, the researcher will suggest that a room or an area might be suitable for fixed sensors but you are free to exclude some areas of your residence, not discuss what they are or what goes on in them. By walking together, it will be much easier for you to recall different activities and routines, devices that are used and so on, and for the researcher to get a good grasp of daily life in the home and assess its suitability for the trial. When the tour is finished, you will be asked to complete the questionnaire with the researcher to capture more formally various aspects of activities and routines that have been discussed during the tour, along with basic information such as, how many occupants, familial relations, age, number/type of rooms and utility features.

Living with sensors

You will next be asked to agree on a second appointment so that the fieldwork researchers can go ahead and set up EGGs and electricity monitors in the places that have been chosen with your approval, and fit the activity sensor(s). You will not have direct access to data generated by the EGGs but the researchers will assist you in how to monitor electricity use and activity picked up by the wristband. This is a key moment for all persons concerned to re-evaluate or revoke their consent, to give children, if any, the opportunity to learn what is going on and, if of appropriate age, to assent or refuse the sensors. The researchers will check if everyone concerned is clear on how to turn the sensors off and on again, they will go over your responsibilities to visitors and house guests, including visiting children, and discuss with you the format of the time-use diary.

Time use diary

A diary of time use is very useful when compared with sensor-generated data from exactly the same time period. This method is used to establish in the data what goes on. You will be asked to choose a day to start and then complete the diary over four consecutive days whenever it suits you best. The lead researcher will have explained to you in advance how to fill in the blank diary form, allowing you the opportunity to ask questions and raise concerns (see **Part 3**). The researcher will help make this as easy for you as possible and will be available during these days to advise and answer questions. On the completion of the time use diary, you will be able to send it freepost to: **Dr Krístrún Gunnarsdóttir, Department of Sociology, University of Surrey, Guildford, GU2 7XH.**

Final interview and questionnaire

To complete the last step in the trial, you will be asked to agree on a final appointment to have the sensors removed. On the same occasion, the lead researcher will ask to interview you which can take up to 45 minutes including a brief questionnaire.

After you give permission to proceed, the researcher will first reiterate how the appointment is organised to allow you the chance to ask questions and raise concerns. You will be asked a set of open questions about everyone's experience of the trial, including how much effort it took to be involved, about privacy and other issues that have come up in living with the sensors. The aim is to allow you to share freely your thoughts, comments and critique so that the researchers can evaluate the study methods and develop guides to best practice. You will then be given a short questionnaire to capture more formally this information about your efforts and experiences, being the key respondent.

----- 0 -----

The lead researcher would like to record the two interviews on a digital voice recorder to be able to listen to them subsequently and produce a detailed transcript. The interview, questionnaire and time use data will be anonymized and securely stored in digital format for a minimum of 10 years in line with University of Surrey policy. The research could be audited by the University Ethics Committee.

What are the possible disadvantages or risks of taking part?

It is possible that in realising the potential of what sensors can capture with the support of other data, you may feel distressed and experience heightened awareness of your household situation, your relations to others and 'vulnerable times'. The interviews may also touch on sensitive topics as you talk about your domestic life. In line with the British Sociological Association (2002) guidelines, you are free to stop an interview or questionnaire, ask for a break and for recordings to be stopped. In addition, if appropriate, you will be offered information and contact details of counselling and support services.

It is possible that you recognise yourself in written texts that discuss or quote the anonymized data, e.g., in the summary report that will be sent to you at the end of the study or in publications and other reports that are made publicly available. You and other household members may feel offended or compromised. The researchers are obliged to manage such a risk by processing, sharing and communicating anonymized data **as if** they were always presenting the results directly to you in person. Similarly, it is possible that a member of your household recognises some other member in written or oral communications that discuss or quote the anonymized data. The researchers are obliged to manage such a risk by respecting the intimacy of relations in households and their 'internal confidence', e.g., situations involving one household member that may not be known or appreciated by other members.

What are the possible benefits of taking part?

We hope that the results will help social researchers to make good use of sensors in all sorts of research. As we explain above, we ask you as the key respondent to take interviews, complete questionnaires and keep a diary of time use. These methods are essential to get a clear picture of everyday household life and to make sense of the data generated by the sensors. Sensors are new to social researchers and our project is designed to assess if and how they can be used, and to what extent participants accept this technology in their private dwellings. To achieve these goals, the participation of your household is invaluable.

It is likely however, that you will not benefit directly from the study but we hope that all our participants benefit indirectly from discussions with the researchers about the practical implications of using sensors in households. These discussions may bring about new ideas for how to design for *assisted living* and the future of *telecare*, or for more efficient use of energy. Our discussions will also bring to light, without a doubt, the ethical issues that ought to be flagged up and dealt with when sensors are put to use in people's homes.

What happens when the research study stops?

At the end of the trial we will send you a summary with our key findings in lay terms.

What if there is a problem?

If you require any further information concerning this study please do not hesitate to contact Dr Krístrún Gunnarsdóttir on telephone: 07901 595430, or email k.gunnarsdottir@surrey.ac.uk. Additionally, if you have a complaint or concern about any aspect of the way you are dealt with during the course of the study, you may require an independent contact. Please contact Jon Garland, Professor of Criminology and Head of Department of Sociology at the University of Surrey, on telephone: 01483 682829 or email: j.garland@surrey.ac.uk.

Will my taking part in the study be kept confidential?

Yes. All of the information you give and everything you say in interviews as well as all sensor-generated data

from your household, will be anonymised. The results from this study may be used in publications, but those who will read our reports or listen to presentations that discuss or quote the anonymized data, will never know who has contributed to the study.

Personal data will be handled in accordance with the Data Protection Act 1998. Your name, household address and contact information will only be disclosed to the named researchers. No sensor-generated data will be made available outside the research team and all results will be based strictly on anonymised data.

With your consent, to make the most of your participation and to support the advancement of science, the anonymized data from interviews, questionnaires and time use diaries will be processed for sharing with similar research projects and results from the study may be used in future research and for publications outside the research team. Other researchers may use your anonymized words in publications, reports, web pages and other research outputs. Your data will not be used for commercial purposes.

We cannot tell you at this moment what this research will find or what analyses will be successfully carried out, but we can assure you that all appropriate legal, ethical and other approvals will be in place. For practical reasons your consent will not be sought again after the project is terminated (unless you indicate that you wish for us to do so).

In certain exceptional circumstances where you or others in your household may be at significant risk of harm, the researcher may need to report this to an appropriate authority. This would usually be discussed with you first.

Who is organising and funding the research?

The Research is funded by the Economic and Social Research Council <http://www.esrc.ac.uk> and organised by the HomeSense research team at the University of Surrey.

Who has reviewed the project?

The study has been reviewed and received a favourable opinion from the University of Surrey Ethics Committee.

Thank you for taking the time to read this Participant Information Sheet

Part 2 – The sensor suite.

Individual sensor components will first be demonstrated at work before coming to an agreement with your household about setting up sensors. The sensors will be hooked up to tablets and smart phones so that members of your household can play with them to see for themselves what happens in the data when conditions change, and to have a conversation with the researchers about how the data are interpreted and what kind of personal (and potentially sensitive) information could be gleaned from the data views.

The data views generated from data captured by the EGGs and merged with data from the other sensors, will not be available to participants during the trial. There are three reasons for this:

1. **Technical barrier.** An export of data from your household is completely *garbled*. The data can only be structured, visualized and analysed by accessing and fully understanding several specialised tools and instruments, including the database environment and its specifications that decrypt and structure the incoming data, the naming convention used to tag different types of data, and the visualisation tools and how they are configured according to specification by the researchers to generate particular kinds of structured views.
2. **Practical / access permission barrier.** Access to any visualizations hinges on authorisation to access a secure data server and database environment at the University of Surrey, and the access-restricted visualizations that are created with specialised software adapted by the fieldwork researchers.
3. **Ethical barrier.** The research team is obliged to respect the internal confidences of households which prevents them from sharing with participants data from their households that involve the presence and activities of other household members.

The wristband activity sensor

The electricity monitor



