

# SIGCHI Conference Proceedings Format

**Ciabhan Connelly**  
Indiana University  
ciaconne@iu.edu

**Julia Dunbar**  
Siena College  
jc19dunb@siena.edu

## ABSTRACT

This paper gives an overview of the Asynchronous Remote Community (ARC) method of qualitative research, providing guidelines for future researchers wishing to understand or implement it. ARC draws from the existing HCI methods of focus groups, interviews, diaries, and scenarios. It then ports them to an online platform to take advantage of the unique properties of qualitative research conducted through online forums. We draw from existing literature and our experiences running an ARC study on individuals living with HIV to come up with recommendations for future researchers attempting to run an ARC study: researchers should (1) focus on learning about their population extensively so as to design activities that they will be responsive to, (2) be prepared to change activities based on new information, (3) expect to deal with a lot of data in many different formats (which is likely to be difficult to analyze), and finally, (4) carefully consider their research questions and what information they need, so as not to create unnecessary work for themselves. The paper concludes with conclusions and an overview of the work left to do to help integrate ARC into the toolkit of HCI researchers.

## ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous; See <http://acm.org/about/class/1998/> for the full list of ACM classifiers. This section is required.

## Author Keywords

Asynchronous Remote Community (ARC); research methods; focus groups; Facebook; population set.

## INTRODUCTION

The Asynchronous Remote Community (ARC) method of qualitative research has only recently been proposed as an alternative to existing approaches [4]. An ARC study involves a group of participants in an online forum (past studies use Facebook for reasons discussed later on in the paper) completing regular activities both individually and as a group. Activity is an intentionally broad term, and in practice comprises anything from surveys, to ice breakers (used to increase familiarity among the participants for the sake of activities

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

CHI'16, May 07–12, 2016, San Jose, CA, USA

© 2016 Copyright held by the owner/author(s). Publication rights licensed to ACM. ISBN 123-4567-24-567/08/06...\$15.00

DOI: [http://dx.doi.org/10.475/123\\_4](http://dx.doi.org/10.475/123_4)

occurring later), to online adaptations of existing HCI research methods such as diaries or personas.

This approach has many advantages over existing face-to-face (FtF) research methods, as well as its own unique disadvantages. MacLeod et al., outline their research experiences with participants who have rare diseases, and from their study they provide recommendations for other researchers interested in adapting ARC for their research. Prabhakar et al., followed many of the suggestions from the first study to adapt ARC to the population of pregnant mothers, and later provided more recommendations based off of their own experiences [5]. This method allowed researchers to overcome many barriers that obstruct FtF studies such as a geographically distributed target population. The data gathered from each ARC study provides a complete picture of the population's experiences. ARC captures participants thoughts over the course of multiple weeks, and the varied activities allow researchers to have more control over what participants post in response to certain directives.

All existing literature on the ARC method focuses on how it has been implemented for a specific study and population set. While this can be useful to reference, the overview we are providing in this paper will give researchers a more in depth look at the decision making process for designing an ARC study. This paper draws from these studies and three other ARC studies that are currently in progress to identify the ARC method's advantages and disadvantages. We also take an in depth look at the process for designing and adapting the ARC method based on the research questions and target population. This paper serves to better equip the research community to both replicate the ARC method, and to compare other research that involves ARC methodologies.

## RELATED WORK

This section provides an overview of previous work in reviewing qualitative research methods, and existing literature on the ARC method.

## Evaluation Metrics for Qualitative Research

There have been overviews of qualitative research methods similar to ours in the past, such as [2][6][3]. These are valuable because they provide guidelines for researchers wishing to replicate or compare these methods. They also educate researchers on the key features of each method. This helps researchers quickly identify the advantages and disadvantages of each and make an educated decision about what to adapt to serve their research questions. They are also better equipped to report on the strong suits and limitations of the studies they conduct.

## Previous ARC Studies

The first published ARC study focused on patients with rare diseases [4]. The activities used in their study are the basis for all subsequent ARC studies. MacLeod et al., present a series of lessons along with their research, with the goal of aiding others in evaluating and using the ARC method. These lessons range from the advantages of having an existing rapport with participants before the study begins, to balancing ethics and practicality to help ensure that participants are fully aware of the type of study they're signing up for when they provide their consent. Ensuring that consent is informed is particularly challenging for online research such as ARC. This difficulty is exacerbated by the fact that many online platforms can potentially create additional risk factors for populations where privacy is concerned key[1]. These lessons, among others, helped form the groundwork for our understanding of the properties of ARC.

The second published ARC study included a participant pool of both pregnant women and new mothers [5]. The researchers in this study made multiple modifications to the original ARC activities to suit their population. They also made modifications based on lessons from the original ARC study. When reporting on their findings Prabhakar et al. introduced more lessons learned based off of their own successes and failures. These lessons mostly comprise advice for balancing effort on the part of participants and usefulness of data when designing activities. They also provide additional evidence to confirm many of MacLeod et al. lessons learned. Both studies suggest that participants are more likely to feel engaged when other participants are posting to the group regularly.

The lessons learned from both of these papers, as well as the experiences of current ARC method researchers, help to form the pool of knowledge that this paper draws from in its recommendations.

## METHODS

In addition to the information in the related work section, the experience behind the recommendations in this paper come from an ARC study on individuals living with HIV that we participated in. The unique features of this population (in particular the stigma that they experience), as well as a co-design element that we included in our study, help play into our understanding of how the ARC method can be implemented.

## KEY FINDINGS

Here we present a compilation of our knowledge about the implementation and theory of the ARC method.

### Overall Characteristics

There are some features that will remain consistent in most iterations of the ARC method, no matter the population. These features are important to keep in mind when deciding whether the ARC method is ideal for your research, as well as during the design process.

#### *Defining ARC*

One of the advantages of the ARC method is its modularity, as it can be modified to suit most target populations. This means that the ARC method can look very different depending

on the circumstances of the research. It is recommended that researchers intending to implement it read up on previous implementations to better understand how the process looks in practice. The following are the broad details that will remain consistent through any iteration of the ARC method:

Once participants have been recruited, they are invited to a private online forum (traditionally a closed Facebook group). The forum should be private in order to protect participants' information and prevent outside interference during the study. Participants are asked to complete a series of activities, generally with wide completion windows to give participants of all different backgrounds the time to complete them. These activities are generally adaptations of traditional research methods (e.g. focus groups, surveys, co-design, etc...). While it is recommended that researchers include baseline and debriefing surveys, the overall content of these activities should be tailored to the population and research questions.

#### *Volume of Data*

The ARC method collects a lot of data in comparison to other methods of qualitative research. While this is an attractive feature of the ARC method, it also presents complications. The data gathered from ARC is in a variety of formats, and thus provides a multitude of ways to look at the trends throughout a study. This, coupled with the length of the study, means that a lot of effort is required on the part of the researcher. We recommend that if a research question can be answered satisfactorily using other methods of qualitative research, to consider those alternatives before resorting to ARC.

If research questions are broad enough that rich and varied qualitative data is ideal or necessary, the ARC method is an excellent choice. If the research questions are not broad, ARC is still likely to answer them, but there will also likely be faster and less effort intensive ways of answering those questions. In other words, the less you know about what your ultimate findings will be, the more appropriate ARC becomes.

#### *Modularity*

The ARC method generally takes more than a month to run, meaning that there's a lot of time to learn more about the population and modify the study as the research is ongoing. While researchers should have a detailed plan before starting the study, they should be prepared with backup activities if they learn that there are certain types of activities that their population is not receptive to. Similarly, activities that have not yet been conducted are not set in stone. The researchers should expect to be, at the very least, making small modifications to their plans throughout the study. A group of participants might turn out to be less likely to complete activities involving cameras, for example. Once the researchers notice this trend within the population, they should consider switching any activities activities of this type to something that the participants are more likely to complete.

### Population Considerations

All aspects of the design process for an ARC study should be informed about the unique features of the given population. Different demographics will be more responsive to different types of activities, the size of the population will influence the

dropout observed, and the unique situations of the individuals involved may raise additional concerns that the researchers will need to pay attention to.

#### *Size*

It is important to consider the size of the population when implementing ARC. If a population is too small there is the risk of not gathering enough participant data at the end of each activity. Researchers should also expect some of their population to become inactive or drop out by the end of the study. In past research, drop-off starts to become noticeable between weeks three and five, continuing to the end of the study. Certain activities that are more difficult to complete can make it appear as if drop-off is occurring, but participants will return afterwards. An activity spike on the final activity (generally a debrief survey) may be observed.

For point of reference, ARC shares many similarities with focus groups. There is existing literature on the ideal size of focus groups. While there is some disagreement, experts tend to put the range at somewhere between five and twelve in order to maximize the generation of useful data [3], and much of the same reasoning applies to ARC. Too many participants can ultimately dilute interactivity as a few individuals dominate a conversation, and if too few people are participating the value of the interaction goes down. The major difference between the two is that ARC can both support and requires a slightly larger population. An online forum is easier to moderate than face to face interactions, as it is not necessary for researchers to intervene immediately, allowing for more time to consider an appropriate response to undesired behavior. The extended duration and dropoff means that ARC cannot support a small population, however.

While the exact numbers will vary based on the demographics involved and the nature of the study, we recommend an ARC study consist of no fewer than ten participants. While it is far more feasible to conduct ARC with a large number of participants than a focus group, each additional participant adds more work for the researcher both during the study and in processing the data. We suggest twenty as a soft cap for the number of participants in a single group. Prabhakar et al., have shown the effectiveness of splitting their population into homogeneous groups, using the same activities in tandem on these new subgroups [5].

#### *Location*

Knowing the location of a population set before beginning ARC is essential because it can determine multiple underlying factors when it comes to the amount of participant discussion there is for each activity. Since ARC uses an online platform for conducting research one of the biggest considerations for population location is their access to technology, such as if most of the participants are from a rural area they might have more limited access to technology. Another aspect that should consider some forethought is if participants are from the same geographical area they all may naturally have familiarity with one another. This would require less introductory work for the researcher as opposed to if the participants are from multiple locations and are completely new to one another.

#### *Time Constraints*

Another consideration to assess with populations are their time constraints. Depending on the population being studied some may have more or different time constraints than others. So knowing your population in advance and modifying activities so that the activities fits their time constraints is highly necessary.

#### *Stigma*

Every different population subset has a multitude of stigmas associated with it. The HIV population that we conducted our research on is considered a highly stigmatized group in comparison to many others and due to this we modified our activities with their stigmatization in mind. Stigma usually brings up many unwanted feelings amongst individuals so it is necessary to strive to create activities that do not overstep these boundaries while also still gathering the necessary information for the research.

#### *Privacy*

The biggest risk to participants in an online study is the possibility of their information being leaked. Even if researchers are completely ethical, the websites used can record information about the participants without the knowledge of anyone involved [1]. This makes informed consent especially important. For populations where leaked data could create huge personal risk, researchers could consider hosting their own forum to aid in controlling the possible sources of a privacy leak.

#### *Facebook History*

Past ARC studies have been conducted through Facebook due to the ease of use for participants, and the existing structure for setting up private groups. This provides an opportunity for researchers to learn about the online habits of their participants. Looking at the trends of potential participants' online activity before beginning the study is useful for gauging how often the participants are likely to be online, and therefore the amount of time that should be given to complete an activity. This can also be helpful for predicting the rate at which activity will drop throughout the study.

#### *Relationship with Participants*

MacLeod et al. suggest that a relationship with the participants going into the study will have a positive effect on participation. Researchers will have the opportunity to get participants invested in their work and results, as well as build trust and familiarity.

### **Activity Selection**

#### *Original ARC Activities*

This section contains the 11 original ARC method group activities. We will describe each activity as well as giving the pros and cons of each one.

-*Diary*: In this activity participants are expected to keep track of their interactions with others and record the outcome. (Motivated by...).

Pros: Direct insight into the participants lives and how others impact it, potentially useful for some other activities, etc

Cons: Time consuming, depends on your research focus to be applicable, may be perceived as too personal, etc.

*-Circles:* Participants are asked to draw a circle on a piece of paper with themselves or another main focus at the center. The farther away certain things are from the center circle the less meaning it has or the harder it is to conquer. (Motivated by...).

Pros: Easily adaptable to other populations, quick and easy activity if you have the resources, etc.

Cons: People may not have the resources (to take photo, make the circle, print out a template), potential to be repetitive of other activities, etc.

*-Questions:* A series of questions created by the participants about what they wish others would ask them or what they wish they could learn more about. (Motivated by...).

Pros: Gets directly at the heart of the participants problems, good insight into participants thoughts, gives a collaborative atmosphere, etc.

Cons: Have to be careful with questions (what participants come up with), have to make sure the questions have a purpose alongside another activity, etc.

*-Problems:* Participants rank a list of problems that are contrived from posts and They are ranked in order of how much of a problem it was for them individually.

Pros: Can extrapolate out the core of what a lot of the research is getting at, also creates a basis for multiple other activities, overall valuable data, etc.

Cons: It could bring up tough subjects for participants.

*-Photo Elicitation:* Participants are asked to take photos of the themes collected from the problems activity. Then they are asked to send them to the research team privately all at once. After the the research team approves the photos they are posted into the Facebook group and the participants are asked to comment on the post. (Motivated by...).

Pros: Get to see first hand what they are experiencing, gets participants to think about thing in a different way, interesting form of data collection, etc.

Cons: One of the more time consuming activities, can be a bit more restrictive, people need to be more expressive (may be nervous about others opinions), etc.

*-Solutions:* Using the themes from the problems activity participants are asked to come up with and discuss possible solutions.

Pros: coming up with solutions! Gets the participants actively involved in coming up with ideas/solutions for their community,

Cons: Pay attention to phrasing when presenting it.

*-Mad Lib:* Participants are asked to create a Mad Lib that focuses on the more humorous aspects of their conditions. (Motivated by...).

Pros: Gets participants brainstorming, supposed to be interactive and fun, etc.

Cons: Requires more thinking time for participants, time consumption in general, may think we are trivializing their situation too much, etc.

*-Movie Script:* Participants are asked to write a movie script about their life. The script focuses on a relationship between the participant and a friend or relative. (Motivated by...).

Pros: Creative/interactive activity, etc.

Cons: People generally don't like writing activities, time consumption, etc.

*-Rant Line:* A rant line is created for participants to contact at anytime during the day to rant about anything going on in their lives. (Motivated by...).

Pros: People are able to freely express themselves at a stressful moment,

Cons: Have to monitor and check it constantly, talking/messaging to nobody, hard to set up, keeping things confidential, etc.

*-Personas:* Fake personas are created and posted into the group; the participants then critique and discuss how they can relate to the personas. (Motivated by...).

Pros: Possibly relatable stories, can bounce thoughts/stories off of one another, etc.

Cons: Do not want to accidentally have a story rub someone the wrong way, more time for the researcher creating the personas, etc.

-Survey: A debrief survey is sent out to the participants to discuss their experiences.

Pros: Find out what people thought of their entire experience, etc.

Cons: Maybe won't be filled out if people are tired from other activities.

### Other Considerations

### CONCLUSIONS AND FUTURE WORK

The ARC method is still new to the field of HCI, and there's a lot that the community can do to improve our understanding of and ability to use it. Most importantly, researchers should attempt to use the method for themselves so that we can piece together trends to come up with consistent metrics of evaluation between iterations of the method. Researchers should also make modifications to ARC and report on how those modifications improved or hindered their studies.

There is also design potential for the ARC method. Cross-platform applications that allow participants to more easily complete activities that are commonly implemented in ARC

studies would make it easier for new researchers to attempt the method themselves.

### REFERENCES

1. Brenda L Curtis. 2014. Social networking and online recruiting for HIV research: ethical challenges. *Journal of Empirical Research on Human Research Ethics* 9, 1 (2014), 58–70.
2. Jenny Kitzinger. 1995. Qualitative research. Introducing focus groups. *BMJ: British medical journal* 311, 7000 (1995), 299.
3. Jonathan Lazar, Jinjuan Heidi Feng, and Harry Hochheiser. 2017. *Research methods in human-computer interaction*. Morgan Kaufmann.
4. Haley MacLeod, Ben Jelen, Annu Prabhakar, Lora Oehlberg, Katie Siek, and Kay Connelly. 2016. Asynchronous remote communities (arc) for researching distributed populations. *PervasiveHealth'16* (2016).
5. Annu Sible Prabhakar, Lucia Guerra-Reyes, Vanessa M Kleinschmidt, Ben Jelen, Haley MacLeod, Kay Connelly, and Katie A Siek. 2017. Investigating the Suitability of the Asynchronous, Remote, Community-based Method for Pregnant and New Mothers. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. ACM, 4924–4934.
6. Allison Tong, Peter Sainsbury, and Jonathan Craig. 2007. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International journal for quality in health care* 19, 6 (2007), 349–357.