Research
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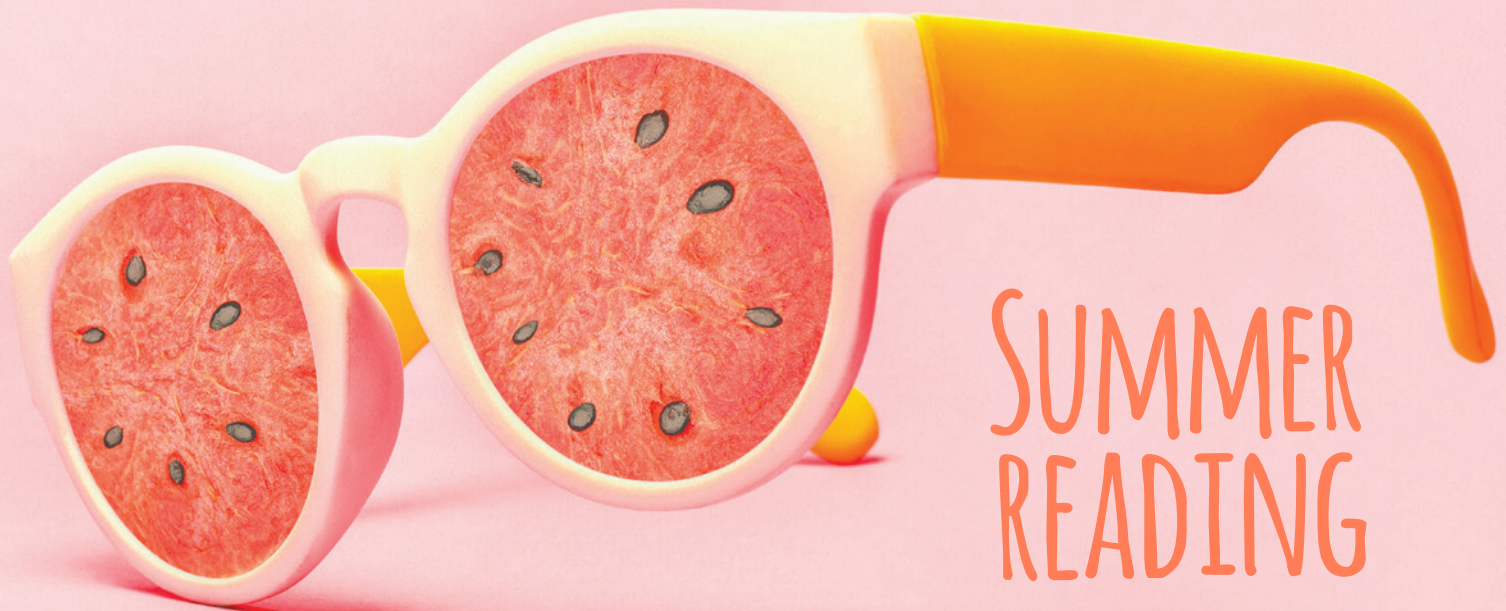
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The Chatbots are coming

What do you need to know?

Recently, we have seen an increasing interest among researchers in the use of chatbots for market research and the number of providers offering chatbot solutions is growing. It is important to keep in mind that chatbots are used far more extensively outside market research than within.

What is a chatbot?

The Oxford Dictionary defines a chatbot as "A computer program designed to simulate conversation with human users, especially over the Internet". While IBM provide a more tech-focused definition:

"A chatbot is a computer program that uses AI to have a conversation with humans. Users can ask questions, make requests and respond to chatbot questions and statements using natural language. A chatbot could support text input, audio input, or both." (IBM Cloud Education, 2019)

There is some disagreement as to whether chatbots use AI, but this disagreement tends to relate to the definition of AI. This is largely a philosophical issue. The key point is that if a chatbot is being used to conduct research with participants it is likely that adaptive scripting (or programming) is being used (which can be considered a

form of AI, or not). It is the functionality that is important, not the name.

A key benefit of using chatbots to gather research information is that they are scalable, potentially lowering the cost.

How are chatbots used in market research?

Chatbots are currently used in both qualitative and quantitative research, with both small and large samples, using both text and voice interfaces. Chatbots are being used in quantitative studies as an alternative to a traditional questionnaire and to conduct qualitative response probing. Some researchers report that chatbots can be used successfully, but some also report challenges.

In January 2019, NewMR partnered with Wizu to conduct an experiment (York & Powton, 2019) into the use of a chatbot as a tool for conducting a structured

interview. The study was conducted with a convenience sample of researchers drawn from the NewMR community. The interview commenced by asking three closed questions and these were followed by a sequence of open-ended questions. Some conditional branching questions were included in the design, but for many participants their responses did not activate the conditional probing questions. This implementation of a chatbot could be described as a traditional questionnaire with a conversational style and interface.

In addition to the chatbot experiment, a number of conversations about chatbots were conducted with market researchers and insight professionals via social media, particularly LinkedIn, and these helped reveal opinions about using chatbots in research.

It would appear that within the market research space a number of schools of

thought exist. I have summarised these elsewhere as:

- Chatbots should mostly be used for qualitative research;
- Chatbots can be used to make existing surveys more engaging for participants – even if they do not produce better data;
- Chatbots should only be used if they produce better data;
- Chatbots should be used in a MVP/Agile way to develop better platforms and approaches;
- Chatbots should only be used when they are substantially more developed. (York, 2019a)

What are the learnings to date?

The growing interest in the potential of chatbots for research has led to researchers conducting pilot studies, tests and research-on-research. Fortunately, a number of these studies have been shared with the research community.

The research, at this stage, tends to explore questions such as:

- How to use chatbots in research;
- The strengths and weaknesses of this mode; and
- The opportunities that lie ahead.

The findings from a number of studies that examined chatbots as a research tool such as Ayoub (2018), Reid (2018), Wizu (2018), York & Powton (2019) can be summarised as follows.

- Participants have reported higher levels of engagement and satisfaction when taking part in chatbot studies, compared to traditional research activities.
- Participants tend to take a longer time to complete chatbot surveys, but this has not been viewed negatively by participants to date.
- Chatbot approaches have been shown to result in longer open-ended answers to questions compared to open-ended questions in questionnaires (as

measured in number of characters and/or number of words).

- The use of conditional or adaptive probing in chatbot conversations has been shown to increase the possibility of both meaningful and flawed interactions. A flawed interaction refers to a situation in which the probing 'goes wrong'. This issue is discussed later in this article.

It should noted that most of the research

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has been conducted on studies using relatively short chatbot interactions, (for example, less than five minutes). Work is needed to understand the impact of using chatbots in longer research interactions.

What are the market research use cases for chatbots?

Chatbots as a research tool are currently considered to work well when the 'conversation' content is relatively easy to predict. This may be because the area or topic is well understood or because the research is being conducted in a narrow and/or specific topic area and it is easier to predict the types of conversations, topics and language that will be used. If these conditions are not met, it may be possible to improve your understanding of the topic and the predictability of response content by conducting exploratory or preliminary research. This could involve desk or

secondary research, qualitative research or a small pilot study.

Currently, the evidence suggests that chatbot research studies are more engaging or enjoyable for research participants. Of course, this may be due to the novelty of the chatbot approach and this impact may decline over time. However, for the time being chatbots have a role to play in situations where participants are not engaged by or are bored with current methods or are suffering from survey fatigue (York & Powton, 2019). Similarly, when traditional quantitative surveys lack appeal to your potential participant group, a chat format that more closely replicates regular online communication behaviour may provide a more appealing or engaging experience for research participants (York & Powton, 2019).

When to avoid using chatbots in research?

Currently, it will be more difficult to use chatbots in exploratory research or where the topic language is not well understood or where the alternative responses are not already specified and are not easy to predict. However, as discussed earlier, incorporating a prior research phase to gather data and insights could be used to improve the design of a chatbot study.

Much of the research undertaken to date shows that when research is conducted via chatbot it takes a longer time for a participant to complete a task compared to other traditional approaches. To date, this has not been seen as a negative consequence as participants find the experience enjoyable and are known to provide longer open-ended responses. However, there are some research contexts where the actual length of time taken to complete a survey is important, as can be the case for in-the-moment or intercept or exit surveys. In situations where the length of time taken to undertake a research task

is an important consideration, a chatbot may not be a preferred or suitable option.

Flawed Interactions

One of the challenges for chatbots is in the area of adaptive probing. Chatbots offer the ability to provide customised or adaptive responses and current research indicates that while this can improve the experience it also increases the likelihood of a flawed interaction (York & Powton, 2019), which can impact negatively on the research experience. For research projects where an inappropriate follow-up question or probe may lead to the risk of a significant negative reaction such as when researching sensitive topics, chatbots may not be the most suitable research tool.

Two examples illustrate a successful and a flawed interaction.

A participant indicates that they like an advertisement. The chatbot might then ask "Why did you like the advertisement?" and the participant says "The cat was funny" and the chatbot follows up with "You did not mention the music. Can you tell me what you thought about the music in the advertisement?" Here the interaction works well.

A participant indicates that they like an advertisement and the chatbot asks "Why did you like the advertisement?" and the participant says "I liked the cat and the backing track" and the chatbot follows up with "You did not mention the music. Can you tell me what you thought about the music in the advertisement?" This is a flawed interaction.

There tends to be a relationship between how 'intelligent' the probing is and the number of flawed interactions (York & Powton, 2019). Currently, attempts to design more adaptive interactions increase the chance of flawed interactions.

Chatbots or not?

As the responses in the NewMR and Wizu study showed, some researchers contend that chatbots "are not yet suitable for research" (York, 2019b, p.35) and that there are methodological challenges to be explored and that further research and development is needed before they are used in live research projects.

Additionally, consideration will need to be given to the impact on sample composition as researchers transition to chatbots. Where benchmarks are used - they will need to be updated. Of course, researchers have dealt with this process in the past, for example, "the transitions from paper to CATI, CATI to online, and online to mobile have all required these issues to be addressed" (York, 2019b, p.35).

However, there is a compelling use case for chatbots. In the online ecosystem, the popularity of chatbots is growing. For many potential research participants, a chat-style interface is more familiar and comfortable than other methods being used in research (e.g. clicking on radio buttons), and it provides a fit with modern communications styles and studies show an initial positive response from participants (York, 2019a; 2019b).

Currently there are many chatbot solutions and it is likely there will be many more launched over the next year or two (York, 2019b). Some of the current uses of chatbots are for qualitative research, notably online and mobile qualitative research. The application of chatbots to the task of conducting qualitative research at scale combined with analysis using AI, is an area generating strong interest. The use of chatbots as an alternative approach to online quantitative questionnaires is also receiving attention.

Process and workflow challenges

The current designs of many chatbot platforms do not match typical research process workflows. For example, chatbots designed as a replacement for an online quantitative survey do not typically produce a traditionally formatted questionnaire and tend to have limited data exports available to the user. Researchers will need to consider this.

Ethical Considerations

There are, of course, ethical issues when using chatbots for research. One of the obvious ethical considerations is that participants need to be informed as to who (or what) they are talking to.

We should also consider and debate a range of issues that have ethical implications. Questions such as:

- Should a research chatbot display human characteristics? And how human should it be?
- Should chatbots display personality characteristics?
- What if participants form bonds with chatbots (with a personality), particularly in longitudinal studies with repeated interactions?
- Are there types of research or participant groups where chatbots are not suitable?
- What are the implications of chatbots responding to a participant?

It is also likely that researchers will revisit some familiar research principles and practices through an ethical lens in light of a chatbot asking questions. For example, questions such as what constitutes a leading question for a chatbot? Is acquiescence bias an issue?

Researchers will also need to assess whether honesty is impacted in chatbot interactions. Are answers given to bots more or less honest than when talking to a person? Are these answers more or less honest than those provided in online questionnaires?

Data and data analysis considerations

Researchers and data analysts often ask what the data that comes from chatbots will 'look' like. The answer is 'it depends', for example, it depends on the design of

the chatbot and the platform used. If you are planning to conduct a chatbot study, questions about what your data will look like should be asked very early in the process. Currently, many chatbot platforms tend to be limited with respect to data exports. The process of exporting data from a software platform and importing the data into a standard market research statistics package may not be an option that is available by default. It is advisable to think about what you need and talk to your chatbot provider. They are likely to offer files in CSV or spreadsheet formats, but they are less likely to support formats such as SPSS or other market research software formats.

Researchers may also need to think about their data analysis differently. One of the key considerations is whether you are undertaking qualitative or quantitative research and your analytic approach should reflect this.

One particular challenge, that is already emerging, relates to the less structured nature of chats when compared to surveys and is exacerbated when conditional probes are used. If the same concept or theme is mentioned at different points or levels in different participant's chats the quantitative analyst needs to think about how these can best be reported and compared.

In conclusion

It seems very likely that the rise of chatbots will continue in both the research space and online environments more generally. If you are a researcher who likes to keep up to date with new developments in research and insights, you need to be aware of what is happening with chatbots.

The approach is still in the early stages of its development as a research tool and there is much work to be done to develop the approach as a methodologically sound option.

If you want to contribute to the future of chatbots, in research you could address one or more of the following questions.

- How human should a chatbot be?
- Should a research chatbot have a personality?
- What ethical issues need to be considered? And how can these issues be addressed?
- How does the quality of data obtained from chatbot approaches compare to current approaches?
- How do chatbot design decisions influence the results?
- How does the use of a chatbot impact sample representation? Does the use of a chatbot allow us to reach new people? And are there participant groups that will not be reached? This list is by no means exhaustive.

If you do conduct research-on-research in the chatbot space, please consider sharing your findings with the research community.

Finally, remember that chatbots in research are still in their infancy and are likely to continue to evolve and this evolution may happen quite rapidly. The platforms will improve and change. However, they will also be less novel to research participants and this may impact how they are perceived by participants in the future.

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Author Note:

Many of the ideas contained in this article are inspired by, drawn from, or build on three recent pieces of work – a NewMR research project, a presentation delivered at the 2019 RANZ Conference and an article written for the RANZ InterVIEW Magazine. These are listed in the references.

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Sue enjoys working at the intersection of research, innovation and technology. She is a co-author of "The Handbook of Mobile Market Research" and co-editor and curator of the ESOMAR book, "Answers to Contemporary Market Research Questions".

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