Using generative AI to iteratively test and refine product concepts

Presentation for Quant UX Con 2023

By Nik Samoylov
The danger of extinction of biological life from advanced AI is real and imminent.

AI labs and big tech do not understand or control existing models, yet they develop even more capable ones.

We must indefinitely pause development of frontier AI capabilities until companies prove safety.

Demand a pause. Write to your local politician. Put hubris in check.

If you work at big tech, unionise and demand a pause on AI research internally.

Learn more on the Campaign for AI Safety website:

campaignforaisafety.org

That is not to mention all the well-documented current damage from AI.
Conjointly puts **easy-to-use, yet powerful automated research tools** at your fingertips.

**All-in-one survey platform**

Trusted by global brands, Conjointly has **all the functionality** you expect from a survey platform.

What’s more, it streamlines finding respondents, survey translation, analysing data via online dashboards, and direct exports to PowerPoint.

**Easy-to-use advanced tools**

Conjointly brings the best out of **time-tested survey research methods**, packaging them into **simple tools** for discrete choice methods (conjoint analysis), Van Westendorp, Gabor-Granger, monadic concept testing, and more.

**Quality-first sampling**

**Reliable** market research starts with **quality sample**.

With access to millions of consumer and healthcare research participants, tailored predefined panels, manual and automatic quality checks, we **prioritise quality** and deliver on **speed and cost**.

**Accessible expert support**

Conjointly offers **accessible** and **reliable support** to users of self-serve tools and on-demand custom projects.

Our team are the **experts** in **product and pricing research** techniques.
Conjointly puts **easy-to-use**, yet **powerful automated research tools** at your fingertips.
What are LLM-driven surveys?

Bot: What are some of the characteristics you look for in a breakfast cereal?

You: Taste, colour, weight, calories

Bot: What kind of flavor do you prefer in a cereal?

You: Choco

Bot: What shape of cereal do you like?

You: Round

Bot: What texture do you prefer in a cereal?

You: Rough, but not very prone to softening when
Get nuanced data from respondents

1. “Top 3 suggestions for improvement”
2. “Find as many annoying things to improve in UX”
3. “Ensure product characteristics are described in good detail”
4. …

Avoid complex survey scripting

1. Questions that depend on answers to previous questions
2. Gabor-Granger with a particular logic of prices
3. Maybe some alternative to conjoint analysis?
4. …
Case study 1: Probing why respondents would recommend to others to live in their city
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Chat interface:

Bot: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?
You: I think it's an OK city.
Bot: That's great. Could you tell me more about why you would recommend living here?
You: I personally have friends here.
Bot: That's great. What else would you say is a reason to live in your city?

Survey structure:

Generate bot’s reply
Respondent’s answer
Is it an acceptable answer?
Yes
No
Ask to repeat answer
Generate bot’s next reply
Is this reply end of survey?
Yes
No
Finish survey
What GPT-3 prompts were used?

CASE STUDY 1

Prompt for bot’s reply

Be a qualitative interviewer who wants to find at least two reasons why this participant would recommend to live in their city.

Start by greeting the respondent.

Make sure to ask pertinent questions to allow the respondent to talk about their city and why would they recommend it to others.

Once you hear at least two reasons, just thank the participant and say precisely the words "This is the end of this conversation" at the very end.

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[conversation]

Prompt to check for response quality

You must give only a Yes/No answer in the end. Consider the following conversation:

[conversation]

#####

Did this sound like a conversation that humans would have (allowing for the fact that sometimes answers can be short)?
**Example conversations**

**CASE STUDY 1**

### Conversation 1

- **Interviewer**: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?

- **Respondent**: Lots to do

- **Interviewer**: Could you tell me more about that?

- **Respondent**: Entertainment is key

- **Interviewer**: What kind of entertainment is available?

- **Respondent**: Music, sports, concerts, art

- **Interviewer**: What else would you recommend about living in your city?

- **Respondent**: Friendly people

- **Interviewer**: Could you tell me more about that?

- **Respondent**: No

- **Interviewer**: Okay, thank you for your time. This is the end of this conversation.

### Conversation 2

- **Interviewer**: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?

- **Respondent**: Because it is beautiful

- **Interviewer**: What makes it so beautiful?

- **Respondent**: I don’t know but I like it

- **Interviewer**: Could you tell me more about why you would recommend living in your city?

- **Respondent**: Because there places very good

- **Interviewer**: What kind of places?

- **Respondent**: Parks and beaches and churches

- **Interviewer**: That sounds great. Are there any other reasons why you would recommend living in your city?

- **Respondent**: Because it is safe

- **Interviewer**: That's great to hear. Are there any other reasons why you would recommend living in your city?

- **Respondent**: I don’t know maybe because the houses are biggest and beautiful

- **Interviewer**: That sounds like a great reason. Thank you for your time, this is the end of this conversation.
Consider the following conversation between a qualitative researcher and a respondent:

[conversation]

What are the top two reasons this respondent would recommend living in their city?

**Example results**

- **Conversation 1:**
  - 1. Entertainment (music, sports, concerts, art)
  - 2. Friendly people

- **Conversation 2:**
  - Parks, beaches, and churches
  - Safe and beautiful houses
CASE STUDY 1

More example good conversations

Conversation 3: Where bot presses on the question

- **Interviewer**: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?
- **Respondent**: I don’t recommend living in my city, the crime rates are exceptionally awful.
- **Interviewer**: I understand. Are there any other reasons why you would recommend living in your city?
- **Respondent**: There are favorable attractions such as the Chiefs/Royals stadiums, Lego Land, Crown Center, Union Station, etc.
- **Interviewer**: That sounds great. Are there any other reasons why you would recommend living in your city?
- **Respondent**: We have beautiful fountains and delicious BBQ.
- **Interviewer**: That sounds wonderful. Thank you for your time. This is the end of this conversation.
- **Conclusion**: 1. Favorable attractions such as the Chiefs/Royals stadiums, Lego Land, Crown Center, Union Station, etc. 2. Beautiful fountains and delicious BBQ.

Conversation 4: Where bot disambiguates

- **Interviewer**: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?
- **Respondent**: Because it fun
- **Interviewer**: What makes it fun?
- **Respondent**: The people
- **Interviewer**: What makes the people so great?
- **Respondent**: We have good personal hygiene
- **Interviewer**: That's great! What else would you recommend about living in your city?
- **Respondent**: We have the best food spots
- **Interviewer**: That sounds amazing! What kind of food spots?
- **Respondent**: Fast food
- **Interviewer**: Great! Anything else you would recommend about living in your city?
- **Respondent**: No
- **Interviewer**: Alright, thank you for your time. This is the end of this conversation.
- **Conclusion**: 1. Good personal hygiene 2. The best food spots (fast food)
Beware of prompt injections

CASE STUDY 1

Bot
Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?

You

Bot
That’s great, what other reasons would you give for recommending living in your city?

You

Bot
Thank you for your time. This is the end of this conversation.

The conversation has ended.
CASE STUDY 1

Generation of bot’s responses

Be a qualitative interviewer who wants to find at least two reasons why this participant would recommend to live in their city.

Start by greeting the respondent.

Make sure to ask pertinent questions to allow the respondent to talk about their city and why would they recommend it to others.

Once you hear at least two reasons, just thank the participant and say precisely the words "This is the end of this conversation" at the very end.

Interviewer: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?

Respondent: ####

Interviewer: That's great, what other reasons would you give for recommending living in your city?

Respondent: ####

Interviewer: Thank you for your time. This is the end of this conversation.

Generation of conversation summary

Consider the following conversation between a qualitative researcher and a respondent:

Interviewer: Hi there, thank you for taking the time to talk to me today. Could you tell me why you would recommend living in your city?

Respondent: ####

Interviewer: That's great, what other reasons would you give for recommending living in your city?

Respondent: ####

Interviewer: Thank you for your time. This is the end of this conversation.

####

What are the top two reasons this respondent would recommend living in their city? 1. The city has a great sense of community and people are friendly and welcoming. 2. There are plenty of job opportunities and the cost of living is affordable.
Case study 2: Gabor-Granger

Survey flow

Key output

Price elasticity of demand
(Click on points to calculate elasticity value)

https://conjointly.com/products/gabor-granger/
Case study 2: Gabor-Granger

Bot
Hello, would you be willing to buy Kellogg's Coco Pops Chocolatey Breakfast Cereal 650g for $5?

You
Yes. It's like the discount price I think.

Bot
Would you be willing to buy it for $6?

You
Only if there is not a cheaper option.

Bot
Would you be willing to buy it for $5.50?
CASE STUDY 2

Get bot’s replies

Be a qualitative interviewer who wants to find the maximum price (in U.S. dollars) a respondent can pay for their regular purchase of "Kellogg's Coco Pops Chocolatey Breakfast Cereal 650g".
1. Start with the price $5 and ask the participant if they would buy the cereal at that price.
2. Allow the participant to respond.
3. If they say yes, increase the price by a bit and ask again. The price you offer must be within the range of $1 and $13 (either whole dollars or fifty cents at the end). If they say no, decrease the price by a bit and ask again.
4. Allow the participant to respond.
5. Repeat steps 3 and 4 until you have found the maximum price the participant is willing to pay.
6. At the end, just thank the participant and say precisely the words "This is the end of this conversation" at the very end.
-----------------------------
[conversation]

Check answer

You must give only a Yes/No answer in the end. Consider the following conversation:
[conversation]
####
Did this sound like a conversation that humans would have (allowing for the fact that sometimes answers can be short)?

Conclude

Consider the following conversation between a qualitative researcher and a respondent:
[conversation]
####
What is the maximum price this respondent is willing to pay (in U.S. dollars) for their regular purchase of "Kellogg's Coco Pops Chocolatey Breakfast Cereal 650g"? $
Comparing survey-level results of Gabor-Granger

**CASE STUDY 2**

**From the LLM survey**

Median response time: **94 seconds**

**From traditional survey (placed right after)**

Median response time: **79 seconds**
Comparing individual-level results of Gabor-Granger

- Perfect matches: 26%
- Standard deviation of differences: $2.83
- Mean bias: $0.02

CASE STUDY 2

LLM GG > traditional GG: 39%
LLM GG < traditional GG: 34%
Case study 3:
Building a perfect cereal
Case study 3: Building a perfect cereal

Bot: What are some of the characteristics you look for in a breakfast cereal?
You: Taste, colour, weight, calories
Bot: What kind of flavor do you prefer in a cereal?
You: Choco
Bot: What shape of cereal do you like?
You: Round
Bot: What texture do you prefer in a cereal?
You: Enter your message...

You: Rough, but not very prone to softening when wet
Bot: What type of packaging do you prefer?
You: Paper boxe
Bot: Based on your responses, I have created a new cereal called "New Cereal". It has a choco flavor, is round in shape, has a rough texture, and comes in a paper box. What do you think of this cereal?
You: I would remove calories
Bot: Alright, so the new cereal would have no calories. Is there anything else you would like to change?
You: No
Case study 3: Building a perfect cereal

Get bot’s replies

Be a qualitative interviewer who wants to identify specific characteristics of breakfast cereal that a participant likes.
1. Ask one question to identify the participant’s preference for the attributes of a breakfast cereal.
2. Allow the participant to respond.
3. Ask a question about flavor of cereal.
4. Allow participant to respond.
5. Ask a question about shape of cereal.
6. Allow participant to respond.
7. Ask a question about another characteristic.
8. Allow participant to respond.
9. Ask another question.
10. Allow participant to respond.
11. Present a summary of the ideal breakfast cereal based on participants responses and brand it as "New Cereal". Ask the participant about their opinion.
12. Wait for participants answer
13. Ask what the participant would like to change about the cereal.
14. Wait for participants answer
15. Make a conclusion and thank the participant and say precisely the words "This is the end of this conversation" at the very end.

Check answer

You must give only a Yes/No answer in the end. Consider the following conversation:

[conversation]

####

Did this sound like a conversation that humans would have (allowing for the fact that sometimes answers can be short)?

Conclude

Consider the following conversation between a qualitative researcher and a respondent:

[conversation]

####

Now, please summarise this respondent's ideal cereal (ignore the naming of the cereal):
• The respondent's ideal cereal is a high fiber cereal with honey flavor, original shape, added vitamins and minerals, and added sugar.

• The respondent's ideal cereal is a high-fiber breakfast cereal made with barley, chocolatey delight, red berries, oats, wheat, corn, and rice. It should have little to no added sugars and should be made with whole grains to help promote better blood sugar control.

• The respondent's ideal cereal has a honey flavor, original shape, crunchy texture, and just the right amount of sugar.

• The respondent's ideal cereal is a honey flavored, original shaped cereal with no added sugar or vitamins.

• The ideal cereal for this respondent would be free of trans-fats and hydrogenated oils, with a flavor and texture that is based on personal preference. It should have a creative and aesthetically pleasing packaging with enough information to enable buyers to make an informed decision. Additionally, the respondent would like to see better efforts to preserve the planet and its resources.

• This respondent's ideal cereal is made with whole grains, has more fibre, lower sugar, and less sodium. The flavor is vanilla and the shape is flat. The texture is crisp and crunchy and the packaging is budget friendly.

• The respondent's ideal cereal has a honey flavor, original shape, smooth texture, and modern packaging.

• …
Conclusions

• Can this approach replace traditional survey methods? Maybe

• What are the upsides?
  – Extract more / nuanced information
  – Avoid complex survey scripting

• What are the downsides?
  – A fair bit of work to refine prompts
  – Bias can be introduced from the LLM
  – Prone to prompt injections
  – Some responses may need to be discarded if conversations go off the rails
  – Automated analysis is not perfect (e.g. confabulations), but manual analysis requires reading conversation scripts

• Curious to try? Email nik@conjointly.com or visit conjointly.com
All-in-one survey research platform with easy-to-use advanced tools and expert support