

# Using AI to improve Behavioural Research (1)

28 January 2025

Speakers: Janna Hastings, Robert West & Susan Michie



Behavioural  
Research UK

BR-UK is supported by  
the Economic and Social  
Research Council  
[grant number  
ES/Y001044/1]

# First of three webinars on AI and behavioural research

- Today: Introduction, with a focus on generative AI
- Later:
  - AI-supported data analysis
  - Responsible use of AI in behavioural research

# Today's objectives

1. To increase knowledge about AI and how it can improve behavioural research
2. To introduce some AI tools and show
  - how they can assist behavioural research
  - pitfalls to avoid
3. To demonstrate the use of two AI tools

# Session Overview

12:00	Welcome & Introductions	Susan Michie
12:05	Generative AI vs Analytical ('traditional') AI	Susan Michie
12:10	Introduction to Generative AI	Janna Hastings
12:20	Demo: Using GenAI to Answer a General Behaviour-Themed Question	
12:30	<b>Q&amp;A (10 minutes)</b>	
12:40	Generative AI in intervention design	Robert West
12:45	Demo: Using GenAI to suggest components of a behavioural intervention	
13:00	<b>Q&amp;A (25 minutes)</b>	
13:25	Summary and Introducing Session 2: AI-Assisted Data Analysis	Susan Michie

# How do Generative AI & Analytical AI Differ?

Susan Michie

# Generative AI vs Analytical (Traditional) AI

- Generative AI – e.g., ChatGPT, Claude, Elicit, Scite
- Analytical AI – e.g., IBM Watson
- **In essence**, generative AI produces new content whereas Analytical AI analyses, classifies and reasons with existing information
- **Purposes**
  - **Generative AI** is designed to create new content or data often mimicking human-like creativity.
  - **Analytical AI** is task-specific and focuses on analysis, prediction, classification, or rule-based decision-making based on existing data.

# Output and applications

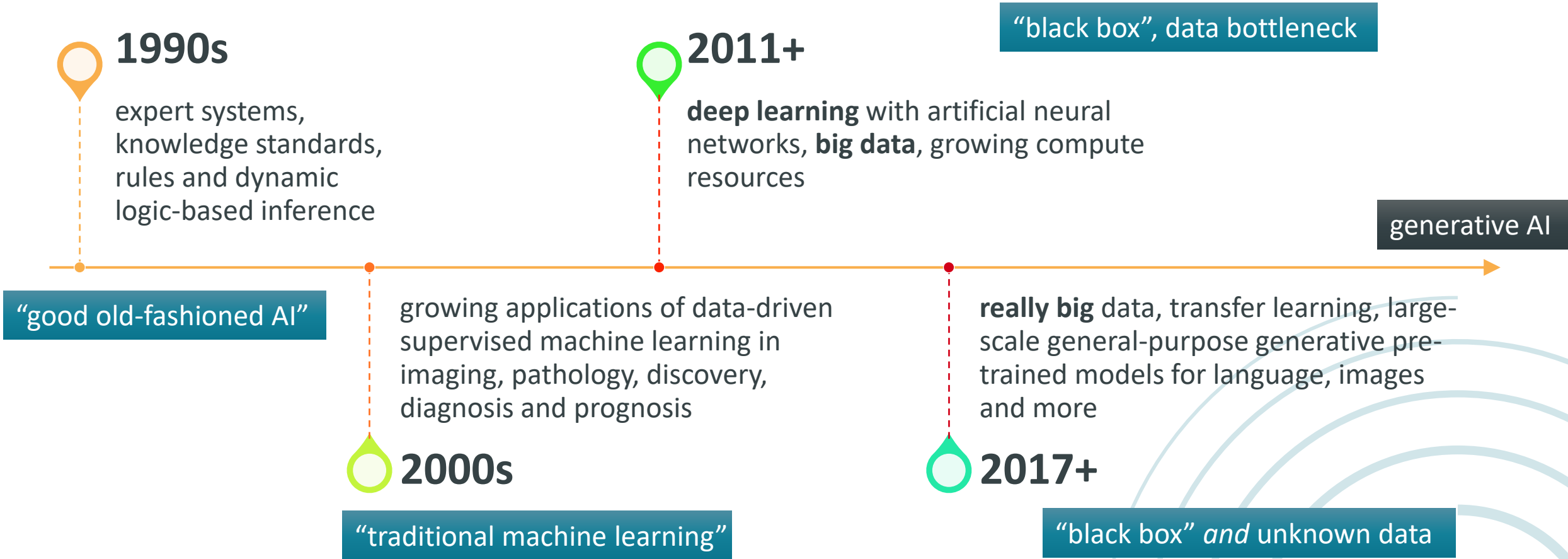
- **Generative AI:** Generates original content such as text, images, audio or code e.g., answering a question, writing a story, designing an image, chatbots.
- **Analytical AI:** Provides labels, predictions, or decisions e.g., fraud detection systems, weather forecasting, diagnosing diseases using medical imaging.
- This webinar focuses on use of Generative AI in behavioural research
- A future webinar will focus on the use of Analytical AI to analyse data and make predictions to novel behaviour change scenarios

# Introduction to Generative AI

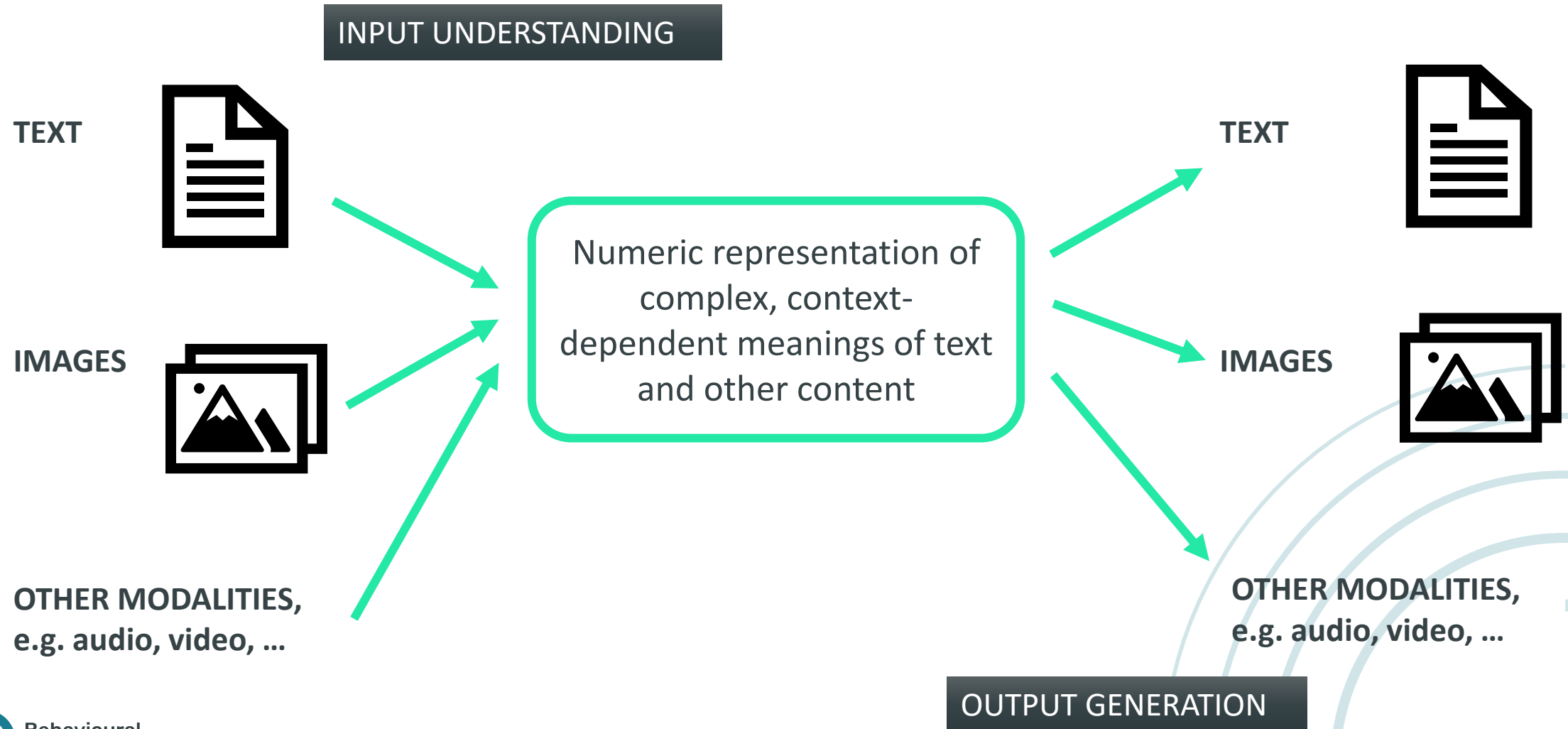
Janna Hastings



# A timeline of AI developments leading to GenAI



# What are the capabilities of modern generative AI models?



# What are some commonly used GenAI models?

- ChatGPT by OpenAI
- Claude by Anthropic
- Llama by Meta
- Gemini by Google



**ChatGPT**



**LLaMA**  
by  **Meta**



# What are the ingredients of an interaction with GenAI?

**SYSTEM INSTRUCTION:** The system has been instructed to play a certain role. You can suggest the system takes on a different role, but only if the overall system instruction allows.

**CONTEXT:** Your previous interactions including earlier chats within the same conversation

**CURRENT PROMPT:** Your current input and dominant instruction



# Demo: Answering behaviour-themed questions

J What behaviour change techniques are commonly used to support healthy eating?

Let me explain some of the most effective behavior change techniques used to support healthy eating.

Self-monitoring is one of the most powerful techniques. This involves keeping track of what you eat through food diaries or apps. Research shows that people who regularly monitor their food intake are more successful at making sustainable dietary changes. This works by increasing awareness of eating patterns and providing concrete data to reflect on.

Implementation intentions, or "if-then" plans, are another key strategy. Instead of just having a general goal like "eat more vegetables," you create specific plans like "If it's lunchtime, I'll fill half my plate with vegetables first." This technique helps bridge the gap between intentions and actual behavior by creating automatic responses to specific situations.

Environmental restructuring can significantly impact eating habits. This involves modifying your surroundings to make healthy choices easier and unhealthy choices harder. For example, keeping fruit visible on the counter while storing less healthy snacks out of sight, using smaller plates to control portions, or pre-preparing healthy snacks for

Reply to Claude...



## Prompting strategies to try:

- Could you be more concise?
- Answer in only one paragraph
- Just give the answer with no explanation
- Please think step-by-step
- Please summarise the above
- Please generate easy examples

# Generative AI in intervention design

Robert West

# The use case

- You have been tasked with undertaking a scoping review to inform development of an intervention to address a behavioural issue such as:
  - Reducing bullying in local schools
  - Increasing take-up of stop-smoking services nationally
  - Reducing incidence of exceeding the posted speed limit by drivers

# A potential workflow

1. Design a prompt to generate a long-list of potentially effective components, optionally for a given mode of delivery
2. Use that prompt in a general LLM product (e.g., ChatGPT)
3. For each plausible item in the long-list, explore the evidence on its likely effectiveness using a science-based LLM product (e.g., Scite)
4. Explore different prompt variants with greater or lesser specificity of 1) behaviour, 3) population and 4) setting
5. Repeat for other 'APEASE' criteria such as acceptability, impact on equity, unwanted spill-over effects
6. Save responses and ask a general LLM to draft a report
7. Discuss and refine with human-in-the-loop methods and traditional searches



# Demo: Identifying intervention components

# Q&A

25 minutes



# Next session: AI-supported data analysis

Keep an eye open for the date ...



THE UNIVERSITY  
of EDINBURGH



Behavioural  
Research UK



The University of Manchester



University of  
St Andrews



The  
University  
Of  
Sheffield.



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales



Scottish Government  
Riaghaltas na h-Alba



UK Health  
Security  
Agency



Government  
Office for Science



Llywodraeth Cymru  
Welsh Government



BR-UK is supported by the Economic and  
Social Research Council  
[grant number ES/Y001044/1]