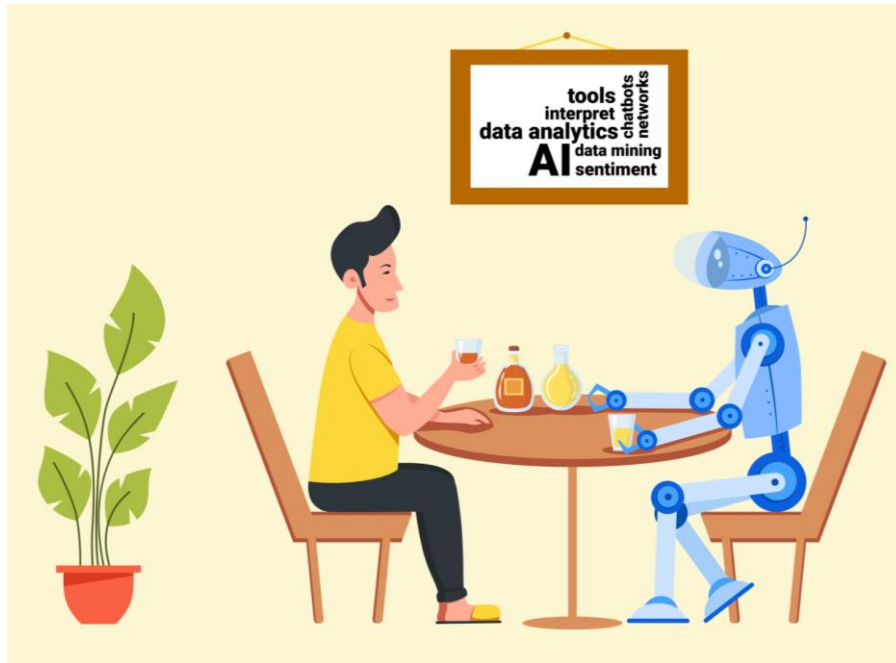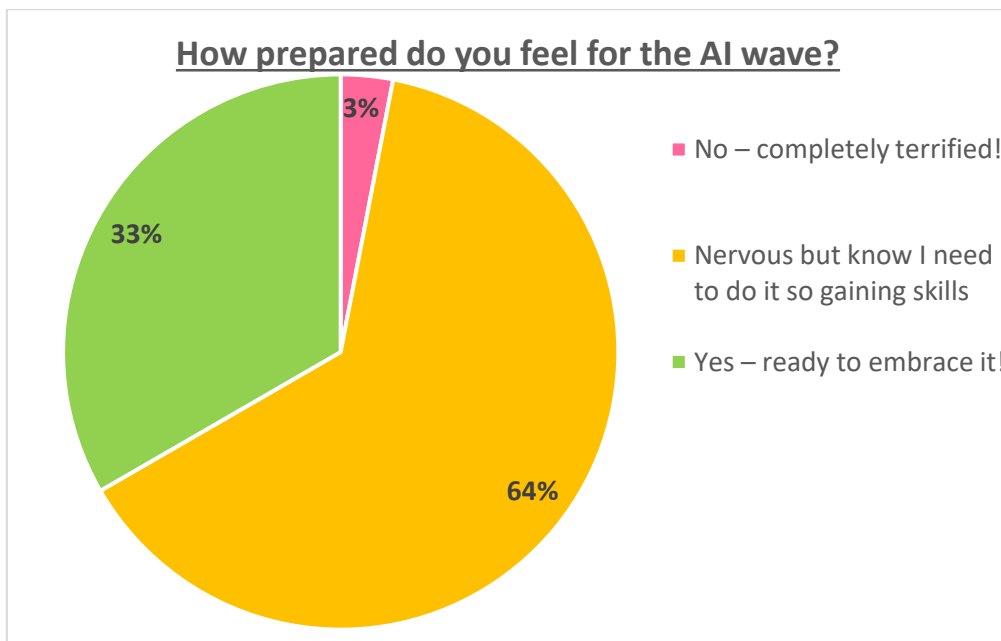**AI in Sensory and Consumer Science**

Break-Out Group Discussions

On 26th November 2020, a total of 60 participants (52 participants & 8 facilitators) attended the SSG workshop on 'Sensory Science Meets Data Science'. We had a good mix of industry, agency and students attend and participate in the webinar and discussions.

Prior to the first breakout session, we asked the question 'How prepared do you feel for the AI wave?'

Most felt nervous but know they need to do it so are keen to gain skills, and 33% felt ready to embrace it. So, it was clear that all could see the value it will bring to us.

Breakout Session 1

What AI and data science tools are you currently using?

- There were many not currently using AI for sensory and consumer science, but it was clear that all see the need for it, want to learn more about it and hope to use it in the future. They would particularly like to use it to assist with analysing data and information (e.g. social media downloads, focus group transcriptions), as there is a lot of sensory and consumer data that is not looked at. It is felt that using AI for data analysis purposes would be fairly easy, as there are many off-the-shelf software packages to enable this. They would also like to use AI for new product creation, but it was thought this was a more difficult area. For example, they would like to use it to assist flavour creation and can imagine a system where the flavour formulations would be on one side of the 'equation' and the sensory descriptive analysis/profile would be on the other, as well as incorporating analytical and consumer data. But it was queried how would the AI cope with all the complex synergies and interactions between all these pieces of information? It was felt that it is how to develop something that is useful for the product developers that will be the challenge.

- A variety of tools & software packages are now being used to assist data collection and analysis, e.g.:
  - Transcription
  - R (but not for machine learning yet, more for stats analysis and panel performance monitoring)
  - Compusense – word clouds for comments (can set number of times mentioned for it to appear in the word cloud)
  - XLSTAT – stats analysis & dataset correlations
  - GC-O – voice recognition that annotates the chromatograms with aroma descriptors as the participant speaks
  - Data mining for choosing products for mapping, then using graph databases for visualising results and linking back to larger data set
  - Data correlation
  - Data visualisation

- It was also discussed how it is perceived that big companies are investing in AI for sensory and consumer analytics. And there is a fear that they are keeping their learning to themselves.

- There was also mention of using Voxpopme , which has been described as incredibly easy to use – particularly in cutting up the videos and creating showreels of consumer feedback – this software transcribes the videos and has great search functions and theme analysis so really speeds up the analysis time.

- Another tool mentioned was Toluna, a quantitative online survey tool that enables companies to be very reactive to business questions and ask the consumer directly in a very short space of time.

How well do the AI and data science tools you currently use perform?

- The majority of those that are using data collection software packages mentioned that the real value comes from automatic reporting, e.g. creating the data tables and charts in the exact format that you need them. This was felt to be where AI is very useful, and where it is speeding up the manual tasks.
- Well, but it can be complicated to set up and if something goes wrong it can be a challenge to rectify or know how to sort it out (particularly in R).
- Voice recognition is great when it works but can be interesting when it is not recognising something.

In an ideal world, what improvements would you like to see in AI and data science offers for sensory & consumer science?

- It needs to be:
    - easy to use and reliable
    - fool proof
    - less cumbersome with data formatting before you can input it
    - something you can trust – so you know it is giving you the correct output and information
- It needs to:
    - take unstructured data
    - collect all data, do the analysis and be a predicting tool
- Data Scientist needs to partner with Sensory Scientists
- It needs to be proof that it works
- There is uncertainty how invasive voice technology is

Potential value

- Prediction of what consumers want and like
- Prediction of sensory profiles
- Combining sensory and consumer data
- Providing accurate consumer preference
- Understanding how consumers use the product (e.g. shampoo in the shower)
- Creating reports
- 3D printing
- Data collection and turn around especially for private label development which requires a lot more agility and speed than brand development.
- Agency use is limited by projects that come through the door, although there is a need to find new ways of doing things that increase efficiency and make us stand out from competitors.

It was interesting that of the 4 students in one of the discussion groups at the event, none were using or knew anything about AI and this certainly was not featuring in their research projects.

Breakout Session 2

What do you consider are the strengths, weaknesses, opportunities and threats for using AI in sensory & consumer science?

Strengths	Weaknesses	Opportunities	Threats
More efficient (quicker and time saving by speeding up data analysis)	Doesn't/can't replace all that we do (although that may also be a good thing)	Want to be able to use it more but don't know how to – there is therefore an opportunity to get it implemented	Lose certain skill sets in the industry
Get new, and more insights and knowledge	Formatting the data first to allow for analysis, which can take time	It gives industry the opportunity to bring in new skill sets into the department (e.g. data scientists) and also the opportunity for Sensory and Consumer Scientists to further their knowledge	How do you know if something is wrong (without double checking the output is correct)?
New ways to analyse results and interrogate data	Difficult to figure out how to resolve issues (can be difficult to understand how to fix something when there is an error)	Getting more people interested in sensory, as it is more on-trend and data-like	Will it affect our jobs? Job losses? Jobs taken over or not necessary/ required anymore?
Able to build in greater number of datasets	Work (programming) to get the ultimate rapid reporting can take a long time and longer than the time it saves for an individual study – requires a lot of initial investment	Opportunity to develop complementary things and new ways of doing things as a result	Knowledge/fear: someone knows more than you so can't 'dip toe in the water' for fear of being seen as foolish
Able to integrate different types of data	Can be expensive and time consuming to install	Enables looking at evolutions and monitoring of things over time e.g. flavour preferences & also looking at new combinations of flavours	Lack of investment
Integrate consumer and sensory data better	Quality of past data/data you put in could have an impact on the quality of the output (rubbish in then get rubbish out)	Go down through the layers of data looking at all aspects (due to speeding up and new software that allows this type of exploration and examination)	How does everyone get the right level of knowledge – where do you go to learn about AI in Sensory and Consumer Science?

Get to predict preferences to guide development/work	Difficult to learn, as too much hype and confusion in terminology and methodology	Bring all the information from different areas together	Getting the right level of knowledge is a threat because it prevents you using it and also if you don't use it, you will be behind
Increase predictive value of models, especially sensory to consumer	Can AI understand the context for the analysis? Less human involvement in analysis may mean important context points are missing. Will it understand the objectives and make the right decision (versus a sensory scientist)?	Removing human bias (e.g. choice of product based on senior person)	Consumers more reliant on AI and bots so making less of their own choices and using senses less?
Ability to potentially predict the future	Data privacy issues may arise	New and very novel insights gathered	Data security
Still need/got human input	New area so skills need to be developed	Saves time, combining data, finessing	Sensory looks at data differently so may misconstrue results
Removing emotional decisions	People's fear and not trusting it	Gives the team an opportunity to take a more leading role in the development cycle	
Removal of human bias	Need a more holistic view	Prediction of the consumer response from sensory data	
Easy access to the data	AI tools clunky, not intuitive		
Friendly formatting and customisable			
AI is flexible and customisable			

The feeling was there's great potential, but some group members didn't know enough to really define what this potential was for their businesses and operation.

It was queried how do you weigh up just launching something and doing a real in-context human study – is it actually quicker and cheaper?

What should we as a profession be doing now to prepare for an AI future?

- Learning about AI
- Trialling AI
- Developing skills as individuals and not be scared
- Making contacts in AI - but how?
- Visibility of successful case studies
- Share case studies so everyone can learn
- Share what AI helped achieve and solve
- Look at the successes and failures
- Talking and sharing experiences – how are suppliers, colleagues and clients using AI? What are their plans for the future? What do we do as an industry?
- Hold discussions about why (and why not) people use AI
- Hold drop-ins and 'ask the expert' sessions
- Make it approachable
- Friendly programmes and interfaces
- Make its use real
- Need more data scientists in the sensory fold to move forwards in general
- Need to trust machines, some skills are there but need more
- Train Sensory and Consumer Scientists in some elements of data science to bridge the wide gap that currently exists between the 2 disciplines
- A barrier to use will be convincing companies to make the investment (be it in kit or personnel with a different skill set) so sharing of industry case studies that demonstrate return of investment will be valuable.
- Be open to it and embrace it but how can we learn about it?

It was a really interesting discussion forum and I know I was previously daunted by the idea of AI, but after the SSG webinars and the discussions in this webinar, I can really see its value and the benefits it will bring to me and my work, and I am really excited to embrace it. Hope you are too 😊

Victoria Whelan, MIFST and SSG Events and Communications Working Groups member; Sensory Scientist II, British American Tobacco on behalf of IFST Sensory Science Group