

THE PSYCHOLOGY OF DATA SCIENCE

BY DR LISA-CHRISTINA WINTER

In marketing, research, or product development, data science is a fixed component in various aspects of our economy. While a couple of years ago, the creation of insights by using data led to a competitive advantage, it has become a requirement to stay competitive, and most companies apply it. However, only a few make use of the powerful combination of psychology and data science.

Psychology is a scientific discipline dealing with the human mind, its cognition and its behaviour by combining scientific methods from natural science as well as humanities. It makes use of qualitative and quantitative research methods. In the case of data science, psychology plays a major role considered from multiple perspectives.

The data scientist is always subject to psychological phenomena such as cognitive biases. One of the most important ones is the confirmation bias: The human tendency to confirm, rather than disconfirm pre-existing hypotheses. However, not only the data scientist is affected. There is also the potential pool of clients or customers who are affected through personalisation and psychology-based segmentation. This article aims to give an idea of how psychological concepts can easily be used in combination with data science. This is highlighted by an example from the field of data-based marketing. Data science is a modern applied scientific discipline with the goal of generating actionable insights from various data sources. By making use of different technologies, it is possible to analyse data from multiple types and sources. There are multiple definitions of data science and there is no universal understanding of the required skillset of a data scientist. Often, however, the profession is understood as a combination of relevant business skills, statistics and an ability to use state-of-the-art technology to turn data into actionable insights.

Since data science is always practiced by humans, psychology always implicitly plays a role. One of the most important aspects of psychology in data science comes into play when results are interpreted: The confirmation bias. Therefore, the bias can lead to severe mistakes in the interpretation of results. It can drive the analyst's attempts to make a statistical model to fit their hypothesis in order to find what they want, instead of accepting to find possible unexpected results which may lead to new insights.

On that account, the topic of cognitive biases is an extensive one while being an undesirable psychological aspect in data science. Still, we can gain psychological insights that can be used for the benefit of a business.

Each type of behavioural data reflects on human habits, attitudes or personality. Behaviour is interpreted as the reflection of latent constructs, such as personality traits. Data science is relevant in every aspect of marketing, in-

cluding the selection and development of the product. Still, it is most widely used to increase revenue by identifying potential clients, maintaining retention for existing clients and identifying up-selling and cross-selling opportunities. At the same time, targeted marketing leads to a decrease in marketing costs. Potential or existing clients are meant to receive relevant information. As the term "personalisation" implies, services, interactions and information are tailored to a person's or segment's specific needs and preferences. High personalisation leads to higher loyalty, to a better customer experience, and, therefore, ultimately to higher sales. Since the customer is in the centre of this data-driven marketing approach, psychological insights can significantly improve results.

So, what does this mean? Let's look at a very common approach of personalisation: Affinity analysis. It is often carried out to identify those clients that are most likely to be interested in a specific offer or product. Based on the data in the CRM, a scoring model can be created to predict the affinity of a specific client for a specific product. Those clients with high affinity scores are the ones to be approached. As a result, one gets a list of those clients that are most likely to favourably receive a specific offer, based on the results of the statistical models of choice. An additional segmentation of information such as the preferred channel of communication can be carried out, in order to know whom to contact when and how in regard to a specific piece of content. In more sophisticated applications, behavioural data is being added to CRM data to identify affinities and segments on a level of finer granularity. However, this does not provide in-depth insights to the client's personality in most cases.

While in most data science applications, quasi-experiential data is being collected and analysed, it is

common in psychological research to carry out experiments to generate new data. The latter is often anonymous and cannot be directly merged with CRM data.

Psychological tests have a long tradition starting in the 19th century, and have been used to identify personality traits. For example, Costa and McCrea's "Big Five", also referred to as the OCEAN model, offer the opportunity to identify the levels of the personality traits openness, conscientiousness, extraversion, agreeableness and neuroticism. Carrying out a psychological experiment with a specific sample of participants and identifying highly correlating relationships with a specific personality type as well as sociodemographic, behavioural or historical aspects enables the mapping of traits to segments of people. This approach results in a more thoroughly modelled, and therefore a more accurate affinity score. It also provides information about how content needs to be presented in order to appeal to a person with a high affinity score. With clever utilisation of psychological insights in data science, conversion rates are drastically increased.

Targeted influencing by creating the desire for a specific product has always been an important part of marketing, but it has probably never been as easy and as effective as it is now due to the powerful merging of psychology and data science.

This type of matching helps businesses to approach their prospective or existing clients at the right time on the right channel and with the right pieces of content. Knowing a person's personality type helps to choose the way in which a message is being delivered: Marketing material for highly extraverted people needs to be designed differently to material for introverted people. The level of neuroticism determines how well a strongly emotional message in marketing is received, and

whether it increases or decreases the chance for a conversion. Ultimately, marketing that is personalised up until the point of our personality traits feels natural and more relevant to ourselves. It increases customer loyalty, sales, conversation rates and referrals. Costs are cut by saving marketing budget. The combination of psychology and data science gives companies the chance to really "get to know" their clients and make any client interaction a pleasant and rewarding experience with a maximum sales probability.

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Dr Lisa-Christina Winter is an Austrian psychologist who discovered her passion for data science and statistics early in her career. Dr Winter applies a combination of data science and psychology in the context of Growth Hacking. She is co-founding the Growthhacking company "Hakuna MaData" which helps companies of all sizes and in all stages of their life-cycle to grow by applying combining know-how in psychology, marketing and data science.

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