Artificial intelligence and the value of human reason

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Artificial intelligence (AI) is here to stay; it will continue to develop and take over an increasing number of tasks that were previously performed by humans. It is important to make clear that AI can be useful and helpful. We have published three articles on the topic of AI in JAO,[1-3] and MRI and radiographic analysis are examples of areas where better results can be delivered with the help of AI alongside the doctor than with human analysis alone.

Despite this, trust in AI is still lacking. According to the Edelman Trust Barometer 2022,[4] 35% of respondents to a survey conducted worldwide rejected the use of AI, and in industrialised countries, the figure reached 45%. Today's AI models, which are based on machine learning, are black boxes, meaning that nobody knows exactly how they make their decisions. Mistrust arises because we do not know whether AI has invented something and generated false information, or whether it has produced something true. Due to our involvement in aligner orthodontics, we are familiar with this situation of a loss of trust and control. Large aligner companies create virtual treatment simulations with the help of AI. Where do the "big data" come from, what rules are implemented, what goals are defined? We need to know how our ideas relating to tooth movement and occlusion are realised. The more we know about this and the background, the more trust we can place in the virtual treatment simulation created.

The final decision as to whether and the extent to which AI can be trusted is left to pure human reason. Trust in AI requires us as users to know how the AI arrives at results, which tasks it can and cannot complete, which biases it has and how reliably it works at all; it needs clear responsibilities and rules.[4] AI can and should serve as a "tool" to improve our scientific understanding, not to replace human abilities. It should help us to recognise complex problems and contribute to solutions.

AI models such as ChatGPT can certainly be employed, and their use can be ethically justifiable if it is specified. Not stating when AI has been used is dishonest and misleading, and must be declared as unethical behaviour. AI systems do not recognise a "critique of pure reason" and cannot determine or reflect on their own limits of competence; this must be done externally, according to Vogl.[5] These limits of competence need to be pointed out and explained.

Since 2005, scientists have been working on agnotology, the study of how ignorance and untruth are created and maintained. There is no lack of knowledge here; ignorance is the result of "political, cultural and commercial" interests through manipulation or misleading, false or suppressed information, as well as censorship.[6] In the scientific domain, so-called "junk science" is developing as a result, with alternative facts being disseminated on the internet on topics including sugar consumption, tobacco consumption and climate change.

In the discussion about AI, I feel that one aspect is neglected, namely the distinction between what AI should and should not be used for. Let's return to the analysis of MRI

and radiographs. AI is a helpful tool in the technical field; it continues to develop and will endure there. It is useful if it remains under human control and the user knows the basics of how AI works. Analysing a complete CBCT scan (and we as orthodontists must assess it as a whole, not just the part we need, such as the displaced canine or the temporomandibular joint) takes time, and this task can be delegated to AI. Subsequently, the results produced by the AI can and indeed must be checked and then rejected or confirmed. Thus, in the technical domain, AI is helpful as it improves the quality of results and saves us time; however, the situation is completely different in the intellectual field. If AI extracts passages of text from big data, reassembles them and then declares them as its own knowledge, this is fraud. If someone then passes this text off as their own and publishes it, they must state this and show that the result did not originate from their own mind. This rule has been acknowledged by Quintessence in its guidelines for authors, and this is a logical and absolutely necessary consequence. The guidelines state: "Authors must disclose whether generative or nongenerative AI-assisted technologies (e.g., large language models or image creators/editors) were used to produce part of the submitted work by including in the Materials and Methods or Acknowledgements section detailed information on the specific use of these technologies during the production of the work, as well as the name of the AI tools employed and their version." Likewise, no AI-generated images may be used. Peer reviewers must also not employ AI. Due to the rapid development of AI, the guidelines will be adapted accordingly in a timely manner.

It is therefore clear that even in the age of AI, Kant's motto for the Enlightenment still holds true: "Sapere aude", which translates as "Have the courage to use your own understanding".[7]

References

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