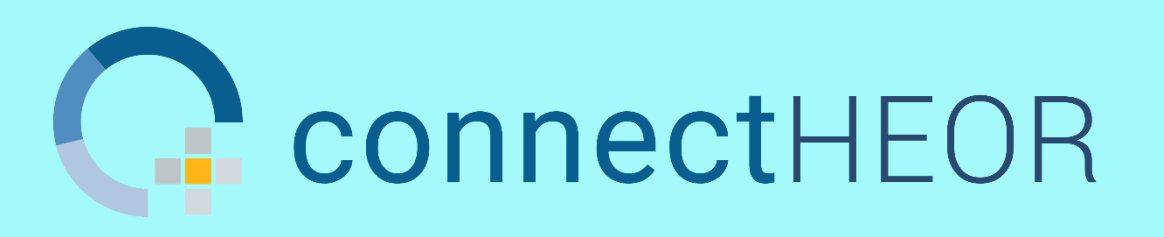


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## BACKGROUND

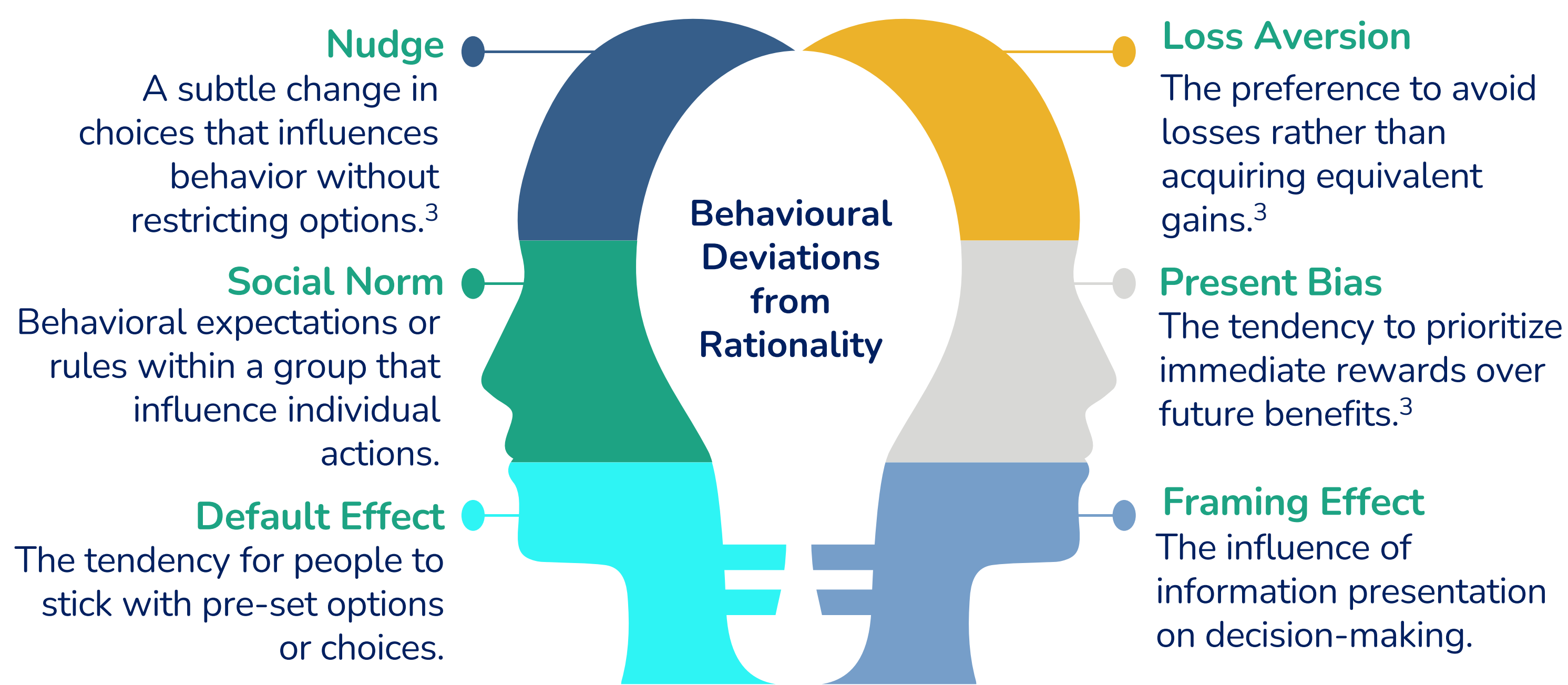
- Traditional healthcare models often overlook human behavioral factors, leading to poor patient adherence and engagement. By incorporating behavioral economics (BE) principles like nudges, framing effects, and social norms, healthcare interventions can become more personalized and effective.
- Artificial Intelligence (AI) enhances health economics and outcomes research (HEOR) by using big data to predict health outcomes and optimize interventions. However, AI may unintentionally introduce biases through flawed data or algorithms, limiting the accuracy of predictions.
- When tied together, AI and BE integration in healthcare decision-making could address crucial gaps that currently exist within their individual frameworks. This integrated approach has potential to enhance decision-making, mitigate algorithmic biases in HEOR, and ultimately improve patient outcomes.

**Incorporating psychological and cognitive insights with AI processes can enhance the accuracy of predictive health outcomes. By tracking complex behavioural tendencies using big data and leveraging AI technologies to subtly reform harmful cognitive biases, BE and AI show immense potential in aiding HEOR decisions.**



## METHODS IN BE

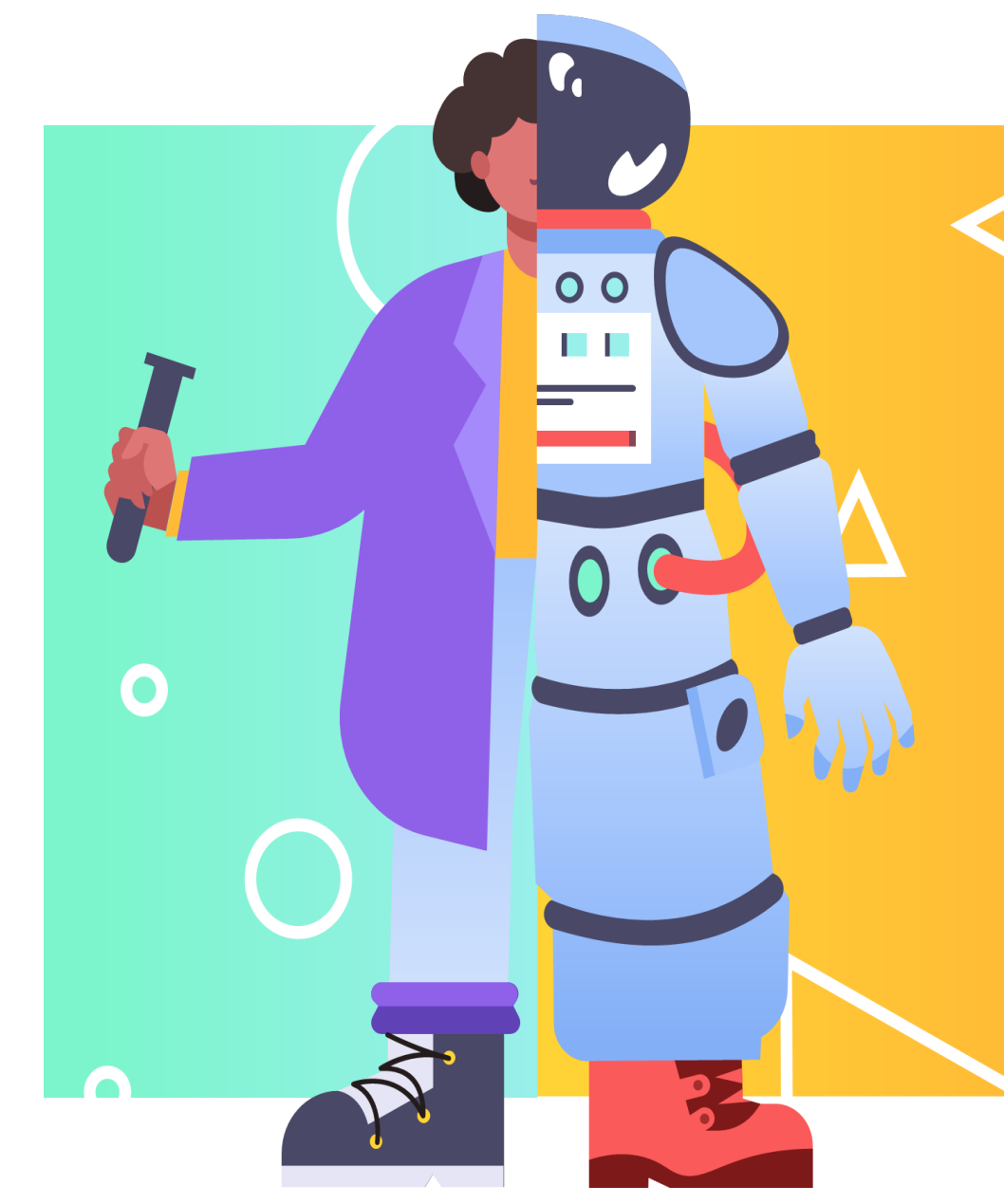
The study recognizes key BE concepts that lead to cognitive biases in decision making. A fair understanding of these heuristics and biases enable us to leverage the appropriate technology to mitigate them.



## METHODS IN AI

The study recognises latest advances in AI to be tapped for aiding HEOR decisions:

- Machine Learning (ML):** AI detects procrastination and sends reminders emphasizing immediate treatment benefits.<sup>4</sup>
- Data Analytics:** AI predicts non-adherence and alerts patients about health risks.<sup>4</sup>
- Wearables:** AI monitors activity using watches or micro body monitors and delivers real-time nudges for better lifestyle choices.



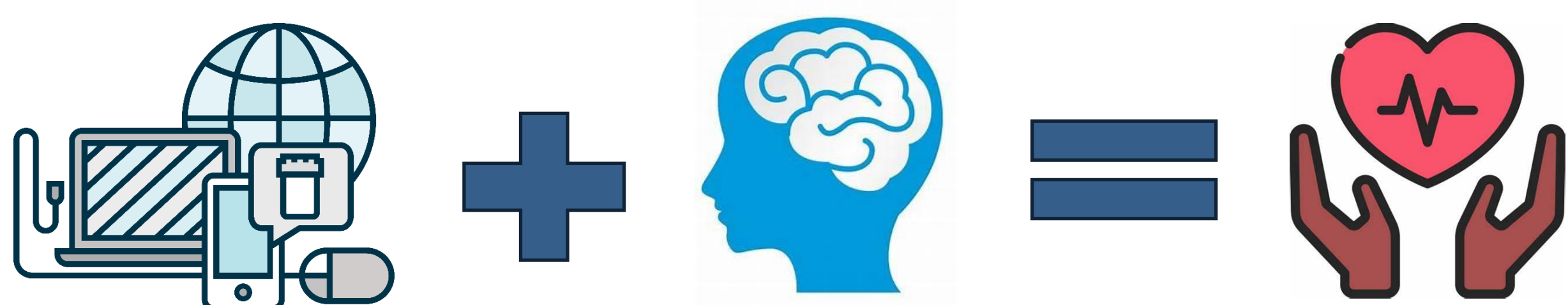
- Natural Language Processing (NLP):** AI delivers treatment options framed to highlight positive outcomes.<sup>1</sup>
- Predictive Analytics:** AI shares peer success stories to influence healthy behaviors.<sup>4</sup>
- Automated Systems:** AI auto-schedules follow-ups and sets default treatments to boost adherence.

## STRATEGIC INTEGRATION OF BE AND AI IN HEOR (EXAMPLES)

Behavioral Instance	BE solution	AI Integration
<b>Hyperbolic Discounting:</b> People prefer immediate gratification over long-term well-being.	Pre-committing to a plan with penalties for non-compliance. <sup>2</sup>	AI can monitor patient behaviour patterns and identify when a person is at high risk of relapse and trigger reminders about penalties.
<b>Status Quo Bias:</b> Individuals tend to stick with the default option or their current state, even when better alternatives exist.	Design systems with default options that favour healthy behaviours. <sup>2</sup>	AI can adjust default settings dynamically to healthier decisions and lifestyle choices..
<b>Optimism Bias:</b> People believe they are less at risk of experiencing negative outcomes compared to others	Techniques to provide a balanced view of health risks as well as realistic scenarios that counter the optimism bias.	AI can detect patterns of optimistic bias in patient behavior and provide balanced or narratives that present realistic scenarios
<b>Herd Behavior:</b> Individuals tend to follow what others are doing, particularly in ambiguous situations	Leverage social norm interventions that highlight healthy behaviors as the norm	AI can exploit herd behavior by promoting positive social norms—like using data on the number of people getting vaccinated —hence encouraging others to follow suit
<b>Ambiguity Aversion:</b> People prefer known risks over unknown risks, which may lead them to avoid beneficial but unfamiliar medical treatments.	Use information framing to reduce ambiguity and simplify information in the form of multistep process or checklists to check re-enforce healthy behaviour. <sup>2</sup>	AI can tailor educational content to individual patient needs, reducing ambiguity by providing clear, concise explanations based on patient history

## RESULTS

AI utilizes big data analytics to predict health outcomes by analyzing extensive healthcare data. Incorporating psychological and cognitive insights into AI processes can enhance the accuracy of predictive models.



By identifying those at a risk of non-adherence, behavioral nudges like personalized reminders highlighting the benefits of adherence can be sent to patients. Another example is in preventive care, using lifestyle and genetic data, AI algorithms can predict the risk for chronic diseases among individuals.

## CONCLUSION

The integration of AI and BE in HEOR holds substantial promise for enhancing healthcare outcomes. Future directions for AI and BE integration in HEOR include leveraging advanced AI technologies like deep learning<sup>1</sup> and NLP to further personalize healthcare interventions. Yet, current hurdles include addressing biases, data privacy, and the complexity of integrating psychological insights with predictive models.

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