NUDGES IN HEALTH CARE TOOLKIT

SUPPLEMENT

Cognitive biases and nudge design

Designing a nudge means thinking about how to influence someone's behavior – and the underlying decision-making – to achieve a desired outcome. We know from studies in behavioral economics and psychology that human decisions systematically stray from the most "rational" choice. Those tendencies have been categorized into what are known as cognitive biases. If we account for the way specific biases affect decision-making and incorporate them into nudge design, ideally, we can make our interventions more effective.

Below are some cognitive biases that we regularly leverage – or seek to overcome – at the Penn Medicine Nudge Unit.

Framing effect

The same information can be interpreted differently depending on how it is presented.

Example use: We increased flu vaccination rates the most with text messages that matched the tone of typical pharmacy communications and reminded patients that a flu shot was "waiting" for them.

Loss aversion

People tend to be more sensitive to negatives (losses) than positives (gains).

Example use: We found a loss-framed intervention the most effective among several types of financial incentives for getting employees to achieve step count goals.

Salience effect

Increasing the distinctness of important material can make it more noticeable.

Example use: We increased the number of serious illness conversations increased fourfold between cancer patients and their doctors using a combination of nudges, including giving doctors a weekly list of patients they were scheduled to see who had high mortality risk.

Status quo bias

People tend to resist change. In many cases, implementing changes as defaults can circumvent this bias and the need for extra work ("sludge") by the people affected.

Example use: By decreasing the default number of opioid tablets in discharge prescription orders, we significantly lowered the number of opioids that emergency departments prescribed to patients.

Anchoring

People tend to rely on early impressions, even when conflicting information is presented later. Emphasizing new information or employing evidence-based defaults can help overcome anchoring bias.

Example use: Screening rates for primary aldosteronism are low, possibly because it was previously considered rare. We are deploying an automated tool to identify patients who may have this disorder and recommend lab tests to their providers.

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Availability

People tend to rely on information that comes readily to mind when making decisions. Availability bias can be addressed similarly to anchoring bias.

Example use: By implementing a default order that called for no daily imaging for patients undergoing palliative radiotherapy, we reduced such imaging – which is unnecessary in these patients but may be ordered by standard practice – by half.

Decision fatigue

When people must make repeated decisions over the course of a day, the decisions tend to get worse over time. Eliminating or guiding decision-making, or shifting important decisions earlier, can help.

Example use: To help providers make evidence-based decisions around labor induction throughout the day, we are nudging towards a tool in the electronic health record that automatically identifies eligible patients, performs a risk calculation, and provides clinical guidance.

Additional resources

Nineteen cognitive biases and related concepts seen in clinical contexts are outlined in the following paper:

Cho, I & Bates, D.W. Behavioral economics interventions in clinical decision support systems. *Yearb Med Inform* **27**, 114-121 (2018) https://dx.doi.org/10.1055/s-0038-1641221.

The Cognitive Bias Codex, a graphic from the Visual Capitalist, offers an organized display of many additional biases.

EXERCISE // Identifying and addressing cognitive biases

Think about an outcome you are trying to achieve. What behaviors – and whose – need to change for this to happen?

Which cognitive biases could prevent your nudge intervention from working well?

How might you overcome these biases?

How might you leverage cognitive biases to make your intervention more effective?

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