

Gaining from Gamification

Gamification may be the key to getting the most from patient questionnaires, as it may increase their devotion and, therefore, the quality of answers

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Much of the data in clinical research to capture the patient voice in clinical trials, observational research, and clinical practice is gathered using questionnaires. However, conventional questionnaire design and, notably, online surveys can be conceived as dull and unengaging, resulting in negative respondent behaviour such as speeding, random responding, lack of attention, and premature termination, ultimately leading to lower quality data (1).

Writing good survey questions may seem deceptively simple. However, the challenges facing questionnaire developers include:

- Getting respondents' attention
- Getting respondents to read things
- Getting respondents to think
- Getting people to respond

Maintaining the respondent's engagement is a key factor in ensuring the data quality does not suffer and that a surprisingly long questionnaire can be administered without significant deterioration in the quality of the data, particularly if efforts are made to maintain respondent motivation (2).

To achieve respondent motivation, it is important to engage the respondent and facilitate their movement along the motivation continuum, through extrinsic motivation – where most survey respondents fall – to intrinsic motivation, where respondents experience greater enjoyment in completing the survey.

One approach to achieving intrinsic motivation for participants completing a questionnaire is applying game mechanics and techniques (gamification) in a non-game context to encourage and motivate survey respondents to participate, engage, and provide quality data while enjoying the experiences. Evidence from research suggests that the application of gamification can produce significant improvements in dropout rates and data that truly represent respondent behaviour (3). Understanding this behaviour and the factors that influence their responses is also an essential component of the design of health surveys. For example, respondents completing a clinical outcome assessment (COA) are required to make decisions and choices throughout the process. However, what are those

influences on those decisions and choices? One approach to understanding respondent behaviour when completing a survey questionnaire, such as a COA, is the application of behavioural economics (BE), which studies the effects of psychological, social, cognitive, and emotional factors on the decisions and judgements of individuals.

What Is Gamification?

Gamification has been defined as “the use of design elements characteristic for games in a non-game context” (4). In terms of survey questions, it is not about a game for game's sake or about extrinsic rewards or badges. Rather, it is about focussing on the mechanic of engagement when respondents who perceive completing a questionnaire as an enjoyable game-like activity are far likelier to devote effort and thought to its completion, thus giving more valuable answers. This will include reframing questions to be more game-like, adding a competitive element as well as providing a reward and feedback that encourages survey participants to move along the motivation continuum based on the self-determination theory by fostering feelings of (5):

- **Autonomy:** Feeling free to do something or not
- **Competence:** Feeling good at something
- **Relatedness:** Feeling that like-minded people do the same
- **Value:** Feeling that what one is doing has meaning

Simple, practical approaches using the right wording and reimagining some basic elements of questionnaire design can make a significant difference to the quantity and quality of the data collected.

Applying Gamification to COA Development

Many research professionals argue that creating the correct introduction is the most important part of developing a survey. This is due to the fact that the majority of potential respondents will decide whether or not to drop out of the survey based mainly on the welcome screen/introduction, which needs to act as the hook to keep respondents. The following is an example of an introduction based on the self-determination theory (5). Although question wording is paramount to ensuring one receives the best quality responses, the design of the instrument – including colour

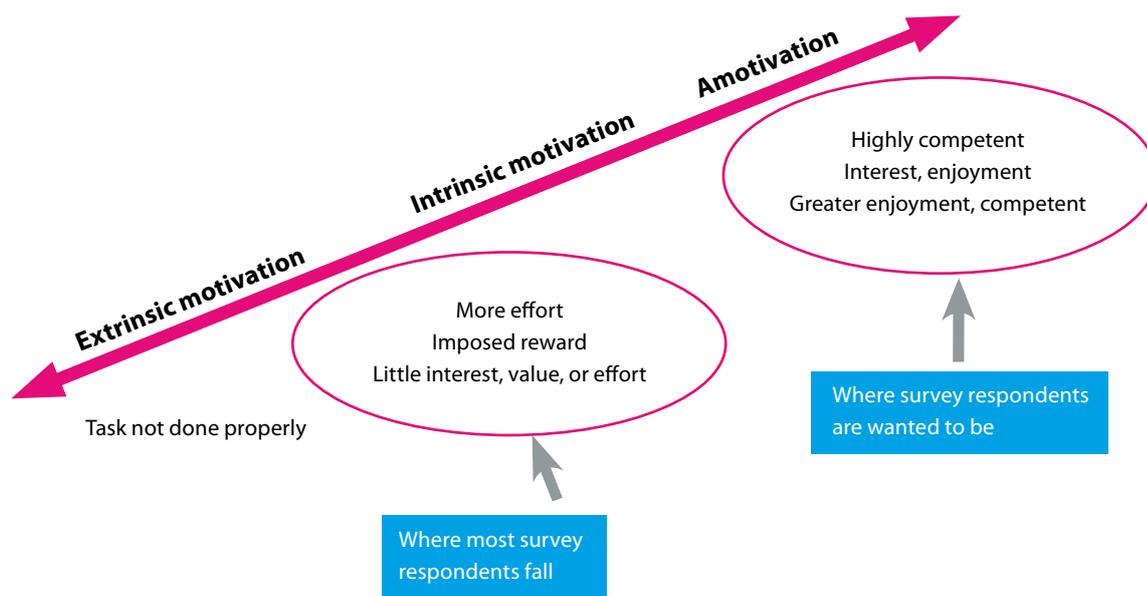


Figure 1: The motivation continuum for survey completion

Thank you very much for choosing (autonomy) to do this important survey. As someone who has the experience of living with diabetes, we have selected you (competence) to help on this survey.

People like you (relatedness) across three countries are taking part in this survey. Your answers and those of everyone else (relatedness) will help us understand more about the treatment you are receiving (value).

The survey should take around 15 minutes, but you can complete it in your own time (autonomy).

All your answers will be confidential.

Please press the START button when you are ready to continue with your survey (autonomy).

for visual engagement and the use of interactive elements such as sliders and drag and drop – must be considered.

Other approaches to enhance engagement include the removal of grid-like question layouts to be replaced by one question per screen and the shortening of item labels. For example, employing elements based on the self-determination theory by providing positive feedback after the respondent has completed each section of the instrument can also be effective: “Thank you for completing this section of the questionnaire, as the expert (competence) your answers will be very important to us’ (value). Please click on the ‘CONTINUE’ button when you are ready to continue with the next set of questions (autonomy).”

Question Wording

Although retaining the integrity and psychometric properties of the COA content is paramount, other approaches to increase participant engagement in health surveys throughout the application of gamification include:

- Reframing questions to be more personal
- Applying time limits and rules
- Adding competitive elements
- Creating a sense of playfulness

Placing Questions in a Personal Context

Ungamified: How much do you agree or disagree with the following statements about how you manage your diabetes?

Versus

Gamified: How much like you are these people?

Applying Time Limits and Rules

Ungamified: Which of the following best describe your current health?

Versus

Gamified: In no more than 10 words, describe your current health.

Adding Competitive Elements

Gamified: Imagine you have two minutes to tell your doctor what you like and dislike about your current medication, what would these be?

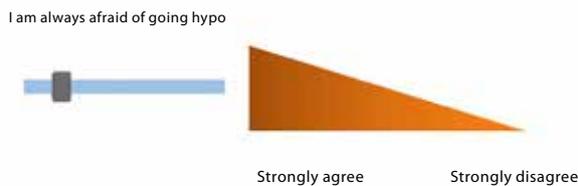


Figure 2: Example of a gamified question

Creating a Sense of Playfulness

Gamified: Imagine a conversation between two people taking part in the same clinical trial as you of the xxx insulin treatment. What do you think they would be saying about it?

What is BE?

Behavioural science lacks as clear a definition as, for example, physics or biology. However, the popular conception is that it draws on the psychology of 'judgement and decision-making' (6-7).

BE is a multi-factor approach to the understanding of human behaviour. It represents a paradigm shift in the way decisions and judgements are made, through one of two approaches:

- Intuition (System 1): Fast to react, difficult to control, is influenced by emotion, and uses mental shortcuts. It also uses heuristics – rules of thumb that help us arrive at quick decisions
- Reasoning (System 2): Slow to react, analytical, and subject to conscious judgements

While System 1 decisions are good enough for much of the time, the use of mental shortcuts to arrive at conclusions can lead to less than optimal outcomes.

BE in COA Development

Completing a questionnaire, such as a COA by the respondent, is a process of judgement and decision-making. However, BE recognises that decisions and judgements are not always rational and can be subconsciously influenced by a number of factors. These include:

- Personal
- Social
- The choice environment
- Salience of content

Applying BE to COA Design

The experiencing self is the 'you' in the moment who lives through the event. The remembering

self is the 'you' who writes the history. Choices are made based on the remembering self's construction of what happened in the past. The problem is that the experiencing self and the remembering self do not agree on what happened. Kahneman speaks of "the tyranny of the remembering self" in the way it makes decisions (7).

The issue with the two selves is that the remembering self is the one keeping score, and, where 'peaks' and 'ends' matter, 'duration' does not. Therefore, the remembering self is prone to biases, which can have significant implications when asking people to remember specific experiences. How might scores on the overall impact of pain on respondents' lives over, for example, the past seven days be affected by the filter of the remembering self? Six days of little or no pain will unlikely compensate for one bad episode of pain. Evaluation of quality of life may be affected by specific high or low points rather than the overall evaluation. This has particular ramifications when asking respondents in real time and retrospectively of their experiences.

Kahneman's research reflects the power of the negativity bias of the brain; humans are hardwired to remember intense, negative experiences more than positive, subtle experiences, even if the positive, subtle experiences are what one's day will mostly consist of. Although large sample sizes may help in cancelling some of these potential biases, the need remains to clearly identify which 'self' is being interrogated whenever possible in the design of a COA measure.

The Impact of Wording Variation

A vast body of survey design research suggests that even slight variations in wording, response options, and question order can affect responses (8-10). How respondents answer a question depends on how the question and options are framed, which can affect thought processes when responding to a survey question (6). Framing refers to how important issues are presented in a survey question (11). For example, respondents are more likely to show a preference to agreeing to a treatment with 95% chance of no contraindications compared to a 5% chance of contraindications, although both chances are the same.

Response Order

The order in which possible responses are listed may also have important effects on results. When extreme response items are placed before a more moderate response – the contrast effect – the preceding extreme responses increase the likelihood of choosing the following, more moderate response (12).

Priming effects

Related to the contrast effect is the priming effect. Priming is one particularly key issue for System 1, which is when a stimulus subconsciously influences the respondent's response to another stimulus (12). This can have a significant impact on respondents' answers as they will be carrying over thoughts from the previous question when interpreting the next. For example:

Which, if any, of the following physical activities have you had difficulty with over the past seven days?

Versus

On the scale of 0 (no difficulty) to 5 (major difficulty), how would you rate your overall difficulty in carrying out any physical activities over the past seven days?

Placing question 1 before the more general question 2 is likely to skew the response to question 2, as the respondent is being familiarised (primed) with the various physical activities. Getting respondents to answer question 2 first is likely to result in a more accurate perception of any difficulty experienced. However, priming effects can be very subtle. Separating topics into different pages/screens, sections, or randomisation if no question order is required can help minimise the effect.

Final Thoughts

Development of a health survey questionnaire, such as a COA, is more than simply drafting the items/questions prior to pretesting and cognitive interviews. With the population as a whole becoming digital, and with short attention spans, the need to consider avoiding, for example, the use of grid and text-heavy questionnaires and apply new strategies, such as gamification and BE that maximise respondent engagement and data quality, exists.

Gamification has already been applied in healthcare settings such as patient support, education, and adherence, and evidence suggests that gamification of survey questionnaires can be a valuable approach to engage respondents and obtain data that is accurate and closer to reality (13).

With respect to BE, the view that human judgements and decisions are deliberative, linear, and thought-controlled is challenged, as these are shown to often be impulsive and influenced by the context of the moment.

In summary, when developing a health survey such as a COA, it must be considered that, within the context

of BE, choices are not the result of careful deliberation. However, they are influenced by readily available information in memory, automatically generated affect, and salient information in the environment. While a number of challenges remain in the application of gamification and BE, evidence shows that both are a valuable addition to the COA design toolbox.

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About the author



Dr Keith Meadows holds a PhD in psychology from the University of London, UK, and has held academic posts at a number of universities conducting health and market research across Europe. He has a range of experience including development and evaluation of clinical outcome assessment measures, qualitative research, and survey design. Keith founded Health Outcomes Insights (formally DHP Research & Consultancy) to help healthcare agencies and pharmaceutical companies across a range of conditions get targeted answers to patient behaviour, experience, and outcomes using both traditional and innovative approaches.

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