

UNDERSTANDING ADHERENCE: THE 13 DRIVERS OF PATIENTS' HEALTH BEHAVIOR

Human behavior is predictable, unpredictable, rational and irrational. Researchers in numerous domains of study have tried to understand what drives decision-making. When it comes to patient behavior, these behavioral studies have an important purpose: addressing non-adherence, i.e., the extent to which patients do not follow their treatments and health recommendations as prescribed by healthcare providers. Globally, the estimated avoidable cost due to treatment nonadherence is in the hundreds of billions of dollars. Roughly 50% of medication prescribed for chronic conditions is actually taken by patients. This represents an incredible loss – in fact, the WHO and researchers in health care contend that improving adherence could have a greater impact on health worldwide than any medicine or new treatment.ⁱ

As Dr. John Piette, Director of the Center for Managing Chronic Disease at the University of Michigan, points out, a common assumption is that most patients do not take medication due to forgetfulness. In fact, in most cases there is another, more complex reason that may or may not come up in the patient's infrequent or short in-person visits with their medical team. Maybe they do not think they need it. Maybe they feel that they already take too many medications. Maybe they do not see the importance or the gravity of their illness.

How can we understand and then find solutions to these complex and unique cases of non-adherence?

Different perspectives come together in the science of understanding patient behavior. This includes applied studies of consumer behavior, psychological or medical studies of individual behavior, and economic and sociological studies of behavior in groups. All these perspectives contribute to measuring the full breadth of behavior to tailor health-care interventions and treatments for individual patients. Building on these many years of research, Observia and a board of experts have developed the SPUR™ model of patient behavioral drivers, working toward improving adherence by personalizing interventions based on individual behavioral profiles.

In this article, we introduce the SPUR™ model and its 13 behavioral drivers.

Building blocks for a model to understand patients' health behavior

Multiple theories have been developed to describe different aspects of patients' behavior. The creators of SPUR™ used many of these theories as building blocks, assembling a comprehensive model that can be used to describe behaviors and, most importantly, understand the motivations and circumstances underlying these behaviors. Here we outline a few of the main theories that contributed to SPUR™.

The COM-B theory provides a basic summary of the important factors that determine patients' behavior during treatment. Behavior is the result of combined influences of **Capability**, **Opportunity**, and **Motivation**.ⁱⁱ Imagine the behavior is exercise. Someone who is sleeping well (physically capable), has time in their day (opportunity), and is motivated will be more likely to exercise than someone who does not fulfill one or more of these factors.

Other models have focused on patients' beliefs and mental states. The goal of an early one of these, **the Health Belief Model (HBM)**ⁱⁱⁱ, first developed in the 1950s, was to explain why people make their health-related decisions. This model proposed that a person's belief in the severity of the illness and the effectiveness of the proposed treatment determines whether they will follow the treatment. A cancer patient who does not believe in the effectiveness of chemotherapy or in the potential severity of the disease may choose alternative therapies.

Ajzen's Theory of Planned Behavior (TPB)^{iv} can also be used to examine health-related behavior, adding 1) the patient's ability to carry out this behavior and 2) the patient's perception of the social norms relating to the behavior. This theory helps us understand the cancer patient better, by taking their personal situation into account, including financial and physical capabilities, as well as their social circle's views on medical treatments and how these views would influence the patient's health decisions. However, as the TPB was not specifically designed to examine health-related behavior, it does not consider research into psychological factors influencing the behavior of people with chronic disease, such as individual trust or confidence in medical authorities, the effect that having an illness has on a patient's self-identity, and their individual tendency to focus on immediate benefits vs. potential benefits in the future.

The Transtheoretical Model, also called the **Stages of Change model**,^v can be used to adjust interventions to where people are in their behavioral change journey. These stages can be illustrated using smoking cessation as an example. People begin in the "pre-contemplation"

stage, before even considering quitting. Eventually, they decide to try to quit, entering an “action” phase before (hopefully) achieving success and then entering a lifelong “maintenance” phase. A person's state of mind and capabilities change vastly from one stage to another, meaning they will respond to outside stimuli in different ways depending on their stage.

The Result: SPUR™

The SPUR™ model has taken all of these theories into account, adding the psychological factors mentioned above that were missing from other frameworks. In this way, it serves as a kind of “grand unified theory,” combining insights from established approaches into a comprehensive whole. As such, it can be used differently from other tools. This is explained succinctly by Benoit Arnould, director of patient-centered outcomes at ICON, a group which was central to the validation of SPUR™: Other theories have focused on characterizing the problem of nonadherence to treatment, some even explaining at least partly why patients exhibit certain behaviors. SPUR™ does all this and more – it is intended to find the underlying causes of non-adherence and, from these, solutions.

The subject of this article, the 13 behavioral drivers, are the factors included in the final SPUR™ model, built from the many behavioral theories that came before. These factors can be categorized into four key dimensions:

1. Social
2. Psychological
3. Usage
4. Rational

The model allows a thorough decoding of these four categories of health-related behavioral drivers. Through this, it provides a complete behavioral profile of the patient's relationship with the disease and its treatment. An international, cross-disciplinary academic board was created to develop a questionnaire from the model by studying hundreds of existing questionnaires. This draft questionnaire was psychometrically validated in multiple languages, pathologies, and cultures. A major goal in the questionnaire's development was to keep the questions as neutral as possible. As Benoit Arnould explains, this is important because people tend to act in socially desirable ways, so they may not be honest if it would make them appear badly in others' eyes. Neutrally-worded questions can mitigate this social desirability effect. Dr. Piette points out that truths gained from this increased honesty on the SPUR™

questionnaire may also serve as a catalyst for important conversations between health care practitioners and patients about the reasons patients may not be taking their medication.

As with any psychological or behavioral tool, it is important to take into account cultural differences as well as differences in language and medical condition. Early results from the cross-cultural psychometric validation of SPUR™ are encouraging, suggesting that it can apply to patients in many cultures. The advanced statistical techniques used to build the questionnaire also allow it to be administered via a dynamic, interactive digital tool that does not require each patient to answer all the questions. As Dr. Piette has said, “What I really like about SPUR is that it has a hierarchical approach. Instead of saying 'Let’s ask you 150 questions and then categorize you,' it allows us to use a small number of questions to quickly and accurately identify what peoples’ issues are. And I think that’s very promising.” The output of this tool can help both health care professionals and digital health interventions to provide support services tailored specifically to the personal behavioral drivers that are interfering with the patient's treatment.

The 13 behavioral drivers

The 13 drivers of health behavior measured by SPUR™ are listed below and paired with illustrative patient cases.

Social: these drive patients to behave according to their perceived role in society

- **Immediate:** how a patient's beliefs about their role and relationships in their immediate entourage affect their behavior
 - **Example:** Peter, a young adult in college, does not like taking his medications in front of his friends, so sometimes he skips medication doses at lunch with them.
- **Societal:** how patient’s beliefs and attitudes about social norms affect their behavior
 - **Example:** Sabina, an adult asthma sufferer, avoids using her inhaler at the gym, surrounded by a large group of strangers”

Psychological: these drivers relate to patients' attitudes about identity, authority, and temporal projection

- **Identity:** how self-defining as a "patient" affects health decisions or even leads to rejection of this new identity.
 - **Example:** Jill, 45 years old, exercises regularly and pays attention to her diet. She recently learned and is having trouble accepting that she has high cholesterol, as her diagnosis does not fit with the perception she has of herself.
- **Authority (Reactance):** how a patient's tendency to react in response to authority (usually, the authority represented by their healthcare provider) affects their health behaviors
 - **Example:** Lucy doesn't like being told what to do and likes to figure things out for herself. She therefore does not follow her health care team's treatment recommendations for her autoimmune condition by the letter.
- **Time (ability to project into the future):** how a patient's view of future benefits (their importance and their likelihood) affects present health behaviors
 - **Example:** Jamie tends to live in the moment. When he is diagnosed with high blood pressure, a condition with no noticeable symptoms, he often forgets to take his medication.

Usage: these drivers relate to the ability of patients to access and follow treatment

- **Self-efficacy:** how a patient's physical and mental capabilities affect treatment
 - **Example:** Alma's prescribed treatment for rheumatoid arthritis requires regular self-administered injections, but she is extremely afraid of needles so skips some doses.
- **Forgetfulness:** how a patient's cognitive status/mental state and the complexity of treatment interact to affect behavior
 - **Example:** Samantha, 78, follows treatments for pre-diabetes, arthritis and asthma. She is supposed to take 6 medications each day, each at different times of day. She usually forgets one or two of them.
- **Availability:** how location and access affect a patient's treatment
 - **Example:** Malik lives in a rural area, at least an hour from the nearest doctor. For him, frequent doctor visits or in-hospital therapies are logistically challenging.

- **Financial:** how financial or other practical considerations affect a patient's treatment
 - **Example:** Jane has regular IV treatments at the hospital for her cancer. Although most medical costs are reimbursed by her insurance, she spends a substantial amount on taxis and can earn less money because she can't work as much.

Rational: these drivers refer to cognitive and educational elements impacting behavior (or - the capacity of the patient to project the benefits/risk balance of the treatment or disease on their life)

- **Disease gravity:** how a patient's view of the severity of the disease or its future complications affects behavior
 - **Example:** Karl was recently diagnosed with diabetes. He only sees his blood sugar fluctuate and thus underestimates the probability of future complications such as problems with circulation, eyesight, kidneys, and his nervous system.
- **Disease susceptibility:** how a patient's perception of their own susceptibility to the disease affects behavior
 - **Example:** Frank has stage I prostate cancer. His father also had prostate cancer, which was treated rather easily. Frank thus underestimates the actual risk of progression for his own case.
- **Treatment benefit:** how a patient's perception of the treatment's potential benefits affects behavior
 - **Example:** Sara has gone through multiple different medications and dietary changes to treat her high blood pressure, and the right combination has not yet been found. She is losing faith in the treatment, so does not follow it to the letter anymore.
- **Treatment risk:** how treatment obstacles or side effects affect health behavior
 - **Example:** Paula has osteoporosis. Her medication causes severe stomach pain. Her doctors tell her the medication requires months of treatment to begin working, but she is having trouble persisting.

Understanding these drivers can be used to help patients

At Observia, we push the boundaries in understanding the unique and complex behavior of each patient with a chronic condition. By combining theories from different academic domains, we built a model that provides a complete behavioral profile. Interventions are then customizable in many ways, and all relevant information on a patient as a whole person undergoing treatment is considered.

This is why so many scientists and so much research has gone into developing and validating SPUR™ as a complete theoretical model for patient behavior. A few illustrative examples of care customization include,

- If we know that a patient is both forgetful and tends to resist authority, they can be provided with frequent reminders phrased in a non-imperative and informative way.
- If a patient does not tend to project far into the future when making decisions, the information they are provided about their treatment can be focused on short-term benefits.
- A patient who underestimates a disease's gravity or their own susceptibility can be provided with frequent informational reminders of likely outcomes, should they choose not to follow their treatment regimen.

As showcased here, healthcare providers can directly use the information provided by SPUR™ to improve their patients' lives. This is the great contribution of SPUR™; behavior and motivations can be clearly understood and then transformed into solutions, with the potential to significantly reduce the global health care crisis of nonadherence.

SPUR™ is a true health-care revolution – and the fact that it is fully digital means it can serve an incredible range of purposes. SPUR™'s standalone version can be used during a medical appointment, or SPUR™ and the ensuing insights it provides can be integrated into digital patient solutions. SPUR™ can even be used as an anthropological tool to better understand the motivations of particular patient populations. It has vast potential to improve patient quality of life across cultures and conditions while at the same time reducing global healthcare costs. Reach out to us to learn more about SPUR™!



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ⁱ Dolgin K. (2020). The SPUR Model: A Framework for Considering Patient Behavior. *Patient preference and adherence*, 14, 97–105. <https://doi.org/10.2147/PPA.S237778>

ⁱⁱ West, R. & Michie, S. (2020) A brief introduction to the COM-B Model of behaviour and the PRIME Theory of motivation. Accessed 28 mar 2022, <https://www.qeios.com/read/WW04E6.2>

ⁱⁱⁱ <https://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html>

^{iv} <https://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories3.html>

^v <https://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories6.html>