



# The Science of Human Decision-Making and Its Value for Physical Therapy

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## Introduction

Patient engagement is a critical factor in patient success, but physical therapists rarely receive training in the science of human decision-making. Behavioral economics is an area of study focused on human tendencies, specifically bias, perception, and decision making, and strategies that impact these tendencies.<sup>1</sup> In this white paper, you'll be introduced to the concepts of behavioral economics, and how integrating these ideas can significantly increase the value of the physical therapy experience by improving effectiveness and efficiency to accomplish more robust and lasting outcomes.

# A Brief History of Behavioral Economics

Behavioral economics is a field of psychology that started in the 1950s, with noteworthy contributors to the field including:

- Nobel prize winner in physics, Richard Feynman
- Nobel prize winner in psychology, Daniel Kahneman (author of *Thinking Fast and Thinking Slow*)
- Economist Richard Thaler (author of *Nudge*)
- Journalist Stephen Dubner (co-author of *Freakonomics*)
- Economist Steve Levitt (co-author of *Freakonomics*)
- Angela Duckworth (author of *Grit*)

Research from the field has informed industries as diverse as marketing, social networks, diets, athletics, pop culture, legislation, healthcare, and even city design.

## Examining the Patient Experience Through Behavioral Economics

### Making Choices Easier Through the 'Nudge'

The concept of the 'nudge' was popularized in the 2008 book *Nudge: Improving Decisions About Health, Wealth, and Happiness* by Richard Thaler and Cass Sunstein. In the best-seller, the authors define the 'nudge' as:

**"Any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting fruit at eye level counts as a nudge. Banning junk food does not."**<sup>2</sup>

A common way to 'nudge' is to influence a decision through availability, like a healthy snack left out on a table, a donation to a local charity on the checkout screen at your grocery store, or an outdoor exercise structure built into the park near your home. When a choice is made more likely by the features of a nudge, a form of friction that might keep you from purchasing, consuming, or participating in a behavior, is removed.<sup>3</sup> Friction inhibits and serves as a barrier toward choosing, but in these examples, easing the friction point—in this case proximity or convenience—serves as a nudge to perform the desired behavior (choosing healthy food, donating to charity, or exercising, respectively).

So where do we see these concepts in the healthcare experience? Let's look at home exercise programs as an example. Patients often experience friction when they consider the difficulty of getting to the clinic in traffic or the perceived difficulty of performing their home exercise program. That friction can be removed by a nudge with a convenient HEP app on their phone that will guide them through their exercises in just a couple clicks. The patient is not mandated to utilize their HEP on the app or restricted from performing their HEP in another way, but the convenience and accessibility given by the app provides a 'nudge' towards desirable behavior (adherence to their exercise program).

## Identifying Unique Motivators and Applying Them to Patient Care

It is important that we understand, recognize, and appreciate that everyone's motivators are different. In rehabilitation and in life, there are intrinsic and extrinsic motivators that affect our behavioral choices.

**Intrinsic motivators** are influential where the individual pursues the action or outcome for how it makes them feel (like productive, skilled, helpful, or healthy). **Extrinsic motivators** may include more tangible rewards (like a pay raise, an award, or recognition from authority figures or peers). Practitioners can deepen their understanding of these human motivations using behavioral economics, affording the opportunity for a greater variety and personalization to the patient experience.

Behavioral economics categorizes common motivators, providing a framework for clinicians to best align the approach to that unique patient. However, it is important to understand that not all motivators resonate with every patient and our role is to understand each and integrate the appropriate components into the plan of care. Let's take a look at examples of extrinsic and intrinsic motivators in healthcare.

Do you know someone who is motivated by social media likes, loves receiving a positive message when 10,000 steps are achieved on their wearable device, or gets satisfaction from progressing the weight that they're using for a given exercise? This is the effect of an **extrinsic motivator** called **gamification**, which enhances engagement by providing rewards or a feeling of progression.<sup>4</sup> When our goals or activities are gamified, we can become more watchful of the points, levels, and rewards and gain a feeling of accomplishment or satisfaction as we watch ourselves hit these metrics.<sup>5</sup>

But because motivation is a personal construct, extrinsic motivators may not be right for every patient. One common example of an **intrinsic motivational strategy** is **loss aversion**, a phenomenon where a real or potential loss is perceived by individuals as more severe than an equivalent gain. In contrast with a gainful focus generated through gamification, loss aversion can serve as a motivator for people who become more engaged when faced with changes that they are in a position to mitigate or prevent.

**In healthcare, patients who are inclined toward gamification may be motivated by setting a new personal best on a variety of tests, such as:**

- Shuttle Run
- Timed Up and Go
- 2 Minute Walk Test
- Knee Range of Motion

**In rehabilitation, this could come in the form of:**

- Steps, reps, watts, or calories
- The levels or labels assigned when people improve (independent, safe, less-assistive device)
- Rewards (badges, stickers, home visits/passes from an inpatient stay)

Examples of loss aversion in rehabilitation can include training to limit age-related losses in strength, reduce fall risk, or prevent atrophy and fitness losses before an elective surgery. Loss aversion can be key for some people facing a recent degenerative disease diagnosis, like strength and balance training in persons with Parkinson's disease, or cognitive training in those with mild cognitive impairment that may evolve into Alzheimer's disease. Though 'loss aversion' sounds negative on paper, appealing to loss aversion is less about fear of what you may be deprived of, and more about motivating the patient to maintain or return to the healthy life they want to enjoy.

But **intrinsic motivation** doesn't always have to come from a response to potential loss. The **Fresh Start Effect** motivates patients to make a permanent change or pivot from past actions. The source can be something as common as a New Year's resolution, or as profound as a significant health event like a total hip replacement, a stroke, or a new diagnosis. These might include lifestyle changes such as quitting smoking, reducing alcohol consumption, or making the switch to a healthier diet; changing behavior to reduce stress; or developing new habits related to physical activity. Rehabilitation staff can harness this effect to suggest a fresh start or support a fresh start that is already underway. These efforts can be transformative when we support our patients, but if practitioners do not recognize or leverage the patient's new mindset, the motivational opportunities can fade or be underutilized.

## Using Behavioral Economics to Identify and Overcome Barriers to Care

Patient engagement and the patient experience are important considerations in providing optimal health care. Both engagement and experience are influenced by the patient's expectations coming into therapy, and their interactions with

the facility, staff, and providers. There are several behavioral economics principles that can help us to understand and effect a positive change in both engagement and experience and overcome common psychological barriers to care. Examples of these include **confirmation bias, optimism bias, the halo effect, and the horns effect.**

Many therapists have worked with patients who doubt their ability to progress from the beginning of care. These patients can often list the number of times they have failed at a certain activity, and use it as justification for not trying or giving up on future efforts. These individuals may be negatively influenced by a phenomenon called **confirmation bias**, described as our increased attention (bias) toward instances that reinforce our perception/opinion and cause us to be less attentive to trials, repetitions, or occasions that debunk/refute our opinion.<sup>6</sup> If we're not careful, these patients could be more likely to continue to see themselves plateauing or regressing.

In contrast is **optimism bias**, when a patient can be inclined to expect an excellent outcome in their left total knee replacement (TKR) recovery after they had an excellent outcome from their right TKR. But any setbacks or difficulties with exercises during the rehab process can be unfairly perceived as a 'failure,' which can influence their attitude towards the procedure and their rehab program. In this example, a patient's past history influences their expectations. Similarly, social and cultural pressures like social media can influence an individual's expectations. Most social media celebrates our triumphs, but doesn't paint a representative picture of the struggles along the way. These lived and vicarious factors are more widely recognized with an appreciation for the biopsychosocial influences on health care. In rehabilitation and most health care, a patient's experience before meeting their practitioner can cause them to form opinions about the care that they will receive.

## Using Behavioral Economics to Identify and Overcome Barriers to Care

Patient expectations can also be influenced by their interactions with nursing staff, reception, and the facility itself, including such factors as ease of access and upkeep, and even what music is playing through overhead speakers. When these interactions are favorable, a patient may be more easily engaged in care because of a phenomenon known as the **halo effect**. The halo effect describes the tendency for positive impressions in one aspect of an organization to determine a positive view on its entire operation.<sup>7</sup> In contrast, when these interactions preceding therapy are unfavorable, the patient may be negatively biased and succumb to the **horns effect**. Variables that influence a halo or horns effect can include clinician or staff uniforms, whether the patient had a positive experience at the front desk, clinicians' credentials, presence of technology, the brightness of ambient lighting, and seeing other patients engaged in care. To foster higher patient satisfaction, it's important to keep in mind the entire experience that we are presenting to our patients, and not limit the scope to just the time spent together.

While there are many psychological effects that can affect the patient experience, therapists can be affected by certain psychological phenomena as well. When we have experienced success with a given technique, we can become biased to believe that this treatment will eventually work, even if it is not having the desired effect with a particular patient. In this circumstance, therapists can be caught in what is known as the **sunk-cost fallacy**. This principle describes situations in which we may unintentionally waste visits or patient potential because we are unwilling to stop and turn back on a clinical decision that we have made.

It is important for therapists to consider the efficacy of our interventions for each person we are helping. If an individual is not responding to the prescribed care, we can change the dosage (resistance, speed, and modality settings), intensity, or even the frequency. Even the most well-designed and personalized plan of care can fail when a patient is medically unstable or is not ready for change, as well as for reasons we haven't discovered yet during the care plan.

**The sunk-cost fallacy principle describes situations in which we may unintentionally waste time or resources because we are unwilling to turn back on a decision that we have made.**



# Behavioral Economics and Motor Learning

Evidence-based practice is grounded in science and is the basis of our treatment recommendations, but cross-discipline research can help us build upon the rehabilitation literature. The science of behavioral economics is closely aligned with the science of motor learning. Wulf and Lewthwaite proposed the “Optimizing Performance Through Intrinsic Motivation and Attention for Learning” (OPTIMAL) motor learning theory. They identified three key factors critical to facilitating motor learning: **autonomy**, **enhanced expectancies**, and **external focus**.<sup>8</sup>

A feeling of autonomy creates agency for patients and integrates their preferences within a plan of care. The easiest way to establish autonomy for a patient is by offering choices. This can range from letting them select the order of treatment for a session, their preference for modalities, and even the time of day that they feel like they can best benefit from therapy. By using the patient’s preferences, we gain therapeutic alliance, are buoyed by their confirmation bias, and may even benefit from the placebo effect.

With **enhanced expectancies**, patients expect improvement based on recent performance. It is important for patients to feel that they have a chance to succeed in the present trial or repetition and in the short term (“I can continue to improve from this level.”). It should be clear that the description of enhanced expectancies is closely related to self-efficacy. Self-efficacy has been consistently shown to positively influence health care outcomes. According to the OPTIMAL theory of motor control, elevated expectations are tied to improved motor performance, and this in turn optimizes motor learning through the elevated attention that learners will experience when they are succeeding routinely. Persons with low self-efficacy are statistically less likely to experience successful outcomes.<sup>9</sup>

## Autonomy with Behavioral Economics

Therapist might say...	Behavioral Economics Principles
“Which activity do you want to start your session with today? Strength, endurance, or balance?”	Consider which option is listed first and last, if you have a preference for their choice.
“For the next set, would you like to try it at a faster speed, or with a weight on your right ankle?”	Consider the number of different options: speed, amount of weight, percentage incline, or no hands, for example. Resist the temptation to list all options.

## Enhanced Expectancies with Behavioral Economics

Patient might say...	Behavioral Economics Principles
“Okay...23. So that is the lowest height that I have stood up from without using my hands. Could you lower the mat by half an inch and let me try it again?”	Patient is employing gamification, tracking, and attending to the measurement.
“So last session we made it to 88 degrees. When I had my left knee done, I was at 92 by the 10th day. I want to get there on this knee as well.”	This statement represents gamification.

**External focus** provides learners a connection to the task or goal, rather than the movement needed to achieve the task. “Kick the ball into the back of the net” has an external focus, in contrast with, “Use the instep of your foot and keep your knee slightly bent,” which represents internal focus. Motor control is organized around the task-individual-environment,<sup>10</sup> not around movement patterns.

Rehabilitation and skill development focused on tasks has been shown to be more successful than devoting attentional resources to the movement particulars.<sup>11</sup> By extension, tasks that can be associated with numbers have the benefit of external focus with gamification, and those tasks that have promise in preventing a decline can benefit from the coupling of external focus and loss aversion.

You may already recognize the complementary relationship between the principles of behavioral economics and those that comprise the OPTIMAL theory.

Ultimately, patient outcomes are our most important goal. The route to optimal patient outcomes should include strategies that maximize attention, intensity, engagement, consistency, belief, and compliance while reducing fear of consequence, such as physical harm, or fear of loss or wasted time, resources, or potential.

## External Focus with Behavioral Economics

Therapist might say...	Behavioral Economics Principles
“Do you see yourself moving your arms like a windshield wiper or a seal?”	Keep analogies familiar to this person— familiarity bias + nudge  Keep examples brief without multiple steps— choice architecture



As we see in these examples, these complementary fields of motor learning and behavioral economics can be leveraged to improve outcomes and may even help to reduce therapist burnout. This can occur through several mechanisms, including the satisfaction of helping people in a meaningful and lasting manner, as well as using an approach that does not burden the care provider to be the source of all healing.

A collaborative process toward wellness can be one in which the patient and therapist celebrate wins, create an optimal and personalized plan of care together, and hold mutual accountability. This empowers the health care provider to:

- **Create treatment plans in partnership with patients**
- **Share the responsibility of motivation with the patient**
- **Collaborate with the patient to identify preferences and tolerance for frequency, intensity, time, and type (FITT)<sup>12</sup>**

This brings us full circle with a virtuous cycle of satisfied patients working with their rehabilitation professional in a collaborative model. Human decision-making and motor learning principles are discussed and leveraged, leading to a healthy and happy care provider who can then, in return, contribute to a healthier care environment for the next patient and their colleagues.

It is important to note that the suggested merger of motor learning and behavioral economics posed in this white paper has precedence in the extensive body of work within performance training and skill development. Within these arenas, the approach known as “ecological validity” is hotly debated and contrasted with that of the more traditional approach toward skill development of learning the fundamentals through drills and emphasis on technique.<sup>13</sup>

# Adopting New Habits and Staying Well

In the 2022 book *Atomic Habits* by James Clear, the author states that for habits to become the new normal, they must begin with behavioral change. Making a behavior change more likely to be adopted comes down to four principles.<sup>14</sup>

Let's consider some healthcare-specific modifications to translate his work into the space of healthy movement. I will suggest that Clear's four principles should include these three considerations to make care plans:

- **Rewarding**
- **Personalized**
- **Productive**

While it is not necessary that physical activity always encompasses all three, adoption rates may improve if activities like home exercise programs, visits with a rehabilitation professional, or a community-based wellness program meet at least one or two of these considerations. These modifications to Clear's ideas are about creating habits that give us the opportunity to leverage gamification through reward, autonomy through personalization, and basic human preferences for being productive, which can be respectively dopaminergic, serotonergic, and oxytocinergic, helping our mental health chemically through endogenous neuromodulators.

Personalization, in the context of changing behavior or establishing new habits, can come in many different shapes and sizes. We can consider performing our head rotation exercises while walking the dog, our hip stretches while on the floor with an infant grandchild, or our resisted/loaded gait exercise while moving bark dust with a wheelbarrow. Productivity is a common motivator across generations, yet it can mean different things to each of us. Some people would happily move more if it were not phrased as "exercise" but rather came in a fashion that seemed helpful to family, community, or an employer.

## MAKE A BEHAVIOR CHANGE MORE LIKELY: 4 PRINCIPLES

- ✓ Make the change obvious
- ✓ Make the change easy
- ✓ Make the change attractive
- ✓ Make the change satisfying

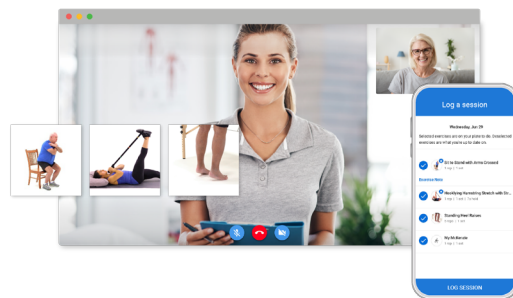
**Rewards can be intrinsic and offer a sense of worth or accomplishment or extrinsic with tangible results. Rewards can be long term, like achieving an improved state of health or completing a marathon next year, or they can be coupled with a behavior that you would like to reward in the near term.**

# Conclusion

The complementary and evidence-based science of how humans make decisions and the similarities to the OPTIMAL theory of motor learning is a powerful tool for physical therapists to incorporate into the plan of care. The understanding that we have the ability to influence a patient's decisions is as important as understanding the evidence and implementation of a treatment technique. We can influence our patients' choices using the order, the principles of choice architecture, the number of choices, or burden, and the relative availability of the options, or nudge. By understanding the impact of choice and motivators, we can align a patient's treatment plan and progression to minimize barriers to success and maximize adoption and engagement.

## How MedBridge Can Help

As discussed in this white paper, applying the theories of behavioral economics can complement care plans, motivate patients, and boost adherence in powerful ways that don't add to the clinician's busy schedule. MedBridge solutions such as the HEP Builder and MedBridge GO mobile app already use principles like gamification and nudge theory to help clinicians increase patient engagement and activation. Our platform includes:



### MedBridge GO

Motivate patient activity with a rewarding mobile home exercise experience, featuring gamification, reminders, and push notifications to help engage patients as active participants.

### Patient Education

Help patients understand their diagnosis and rehabilitation plan with engaging education to encourage them to effectively manage their care plan.

### HEP Program Builder

No matter your patient's motivation style, you can engage patients with an easily accessible and customizable library with thousands of video exercises developed by industry professionals.

### Telehealth Virtual Visits

Supplement in-person visits for low risk patients with effective, user-friendly telehealth tools to support continued interaction and engagement.



#### ABOUT THE AUTHOR

## Mike Studer, PT, DPT, MHS, NCS, CWT, CSST, CBFP, FAPTA

Mike Studer received his physical therapy degree from the University of Missouri-Columbia in 1991. He received his postprofessional MHS degree in physical therapy with neurologic emphasis from the University of Indianapolis. He has been board certified as a clinical specialist in neurologic physical therapy since 1995 and designated a certified exercise expert in the aging adult (CEEAA) by the Academy of Geriatric Physical Therapy since 2011.

Mike has served as the vice president of the Academy of Neurologic Physical Therapy of the American Physical Therapy Association (APTA) and has been the chair and vice-chair of several special interest groups at the national level in each of the Academies of Neurologic and Geriatric Physical Therapy, including balance and falls, stroke, and the practice committee in neurology. He is a full-time treating therapist and founder of Northwest Rehabilitation Associates in Oregon.

Dr. Studer has presented courses and published articles on neurologic and geriatric rehabilitation since 1995 and has authored and co-authored more than 30 articles on topics of neurology and geriatrics, as well as several book chapters on stroke, cognition, Parkinson's disease, and preventive care. Mike is now regularly a guest lecturer on a national and international basis at several universities and national meetings on the topics of stroke, Parkinson's disease, balance, motor control, motor learning, cognitive impairment, and case management. He was awarded the 2011 Clinician of the Year award by the Academy of Neurologic Physical Therapy, and in 2014 received the same award from the Academy of Geriatric Physical Therapy. He was the first to receive this national distinction from each entity.

## About MedBridge

Combining powerful digital patient care tools with the highest quality education, MedBridge is committed to making healthcare better for both providers and patients. Organizations across the care continuum use MedBridge to provide an enriched, digitally enabled experience that engages patients while streamlining and simplifying care. Designed with over a decade of insight from more than 300,000 clinicians and 25 million patients, MedBridge has helped thousands of organizations realize better patient outcomes. [Learn more.](#)

See how MedBridge can help your organization.  
[Contact us to request a demo.](#)

## Appendix: Behavioral Economics Principles and Examples

Principle	For patients	For providers
Nudge	"The gym is on my way home from work." Push notification from HEP app to do exercises	Availability of information or tools HEP templates organized by diagnosis
Friction	"Working out takes time .I have to have a change of clothes, wait for a treadmill..." Two-factor authentication Time required to cook a healthy dinner	"Theraband is back in the storage room, but I am busy with two patients." Customizing HEP from scratch
Loss aversion	Resistance training with aging Scheduling in advance for favorite therapist	Concern over patient outcomes
Gamification	Body weight, lab values, step counters Consecutive streaks for home exercise program	Patient steps in a row without help, lowest pain rating yet to end a session, positive health streaks
Sunk-cost fallacy	Investment in one method of care even though the PT has advised to try another	Maintaining initial care plan even though patient responds with pain and difficulty
Confirmation bias	"The last treatment didn't work, so this one won't either."	Past treatment experiences
Halo effect	Fit-appearing therapist + clean environment + working equipment = great health care provider	Clean waiting room + friendly staff + quality care = great first impression for patient
Fresh start effect	New Year's resolutions "I beat cancer! I am never going to smoke again."	Encouraging a patient after their back surgery

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