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Optimizing Outcomes in Primary Care: We Cannot Spell 'Precision' Without 'Person'

Mike Studer, PT, DPT, MHS, NCS, CEEAA, CWT, CSST, CSRP, CBFP, FAPTA[1,2]

[1]Adjunct professor, Touro University, Las Vegas Nevada, 89154, USA

[2]PTI, University of Nevada Las Vegas (UNLV), Las Vegas, NV 89154, USA

ABSTRACT

Healthcare providers are becoming increasingly more aware of the benefits realized by engaging the health seeker. The literature is clear on the effectiveness of including "the soft skills" of motivational interviewing, of collaborative goal setting, and in utilizing readiness to change models. These soft skills have a hard science in behavioral economics, psychology and more recently in the systemic effects witnessed throughout a person's physiology when they feel recognized and included. As healthcare experiences provider burnout and barriers of efficiency, it can be tempting for the trend of protocols to dominate, alleviating both time and decision making from providers with compassion fatigue. It is the convergence of these pressures, along with the advances in "the soft skills" and a simultaneous rise in (demand for) precision medicine and precision rehabilitation, that we begin to see the chasm between personalized care and precision care. This article details the elusive nature of societal wellness, disease and disability prevention by utilizing a bridge of personalizing care. Affording health seekers and providers alike the opportunity to leverage the science of behavioral change will require a collaboration between patient and provider, one that may even alleviate some of the burdens that providers presently experience.

***Corresponding author**

Mike Studer, PT, DPT, MHS, NCS, CEEAA, CWT, CSST, CSRP, CBFP, FAPTA, Adjunct professor, Touro University, Las Vegas Nevada, 89154, USA and PTI, University of Nevada Las Vegas (UNLV), Las Vegas, NV 89154, USA.

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Introduction

The science of disability and disease prevention as well as disease mitigation are largely conflated with recent anti-aging notions, focused on lifespan. As we realize the true sciences that contribute to healthspan (extending disability-free lives), our understanding is outpacing the success of implementation. While we have more knowledge and better options to choose more healthily now than we have ever had in the pillars of nutrition, supplements, sleep aids, and exercise – we are not adopting these healthy choices. Adoption rates are influenced by an eroding relationship with health care providers, a rise in social media experts, absolutes regarding health bio hacks and an endless unregulated industry of supplements. In this milieu, we are not successfully preventing or mitigating disease any better than we were 20 years ago. Healthspan, while slowing improving, is being outpaced by lifespan, resulting in an elevated rate of disability. People are living longer, while consuming more healthcare and more caregiving - in all forms. As we understand readiness to change theory, the science of human decision making, and psychologically-informed practice, it is now apparent that while precision medicine is the goal, it cannot be spelled without the person, by providing a space for autonomy, supporting beliefs, and offering (as well as implementing) patient choice.

As Hippocrates is credited with saying, *"I would rather know the person who has the disease than the disease the person has*".

As healthcare attempts to improve precision through advances in bioinformatics including understanding Single Nucleotide Polymorphisms (SNPs), phenotypes, signaling molecules, epigenetics, and more, we may be missing some of the answers about precision that are right in front of us. There is no doubt that understanding every individual's cellular makeup will help with addiction management, allergies, autoimmune tendencies and efficacy in pharmaceuticals. We can additionally benefit from a profile on each person, "knowing" their biopsychosocial framework (past medical and rehabilitative history, cultural influences and more). Sometimes the most precise and person-specific solution can come from *listening* to the individual in real time.

Many past and current methods have proven ineffective in creating long-term change. As an example, many patients are able to fill a prescription and have some insurance coverage for what is deemed to be an effective medication, yet research cites from 5-33% do not fill their prescriptions [1,2]. Similarly, people across the world are increasingly more aware of healthy alternatives that could include changes to their diet, increasing their physical activity (exercise plan or other), and even improve their sleep hygiene. As with the prescription, many people make these changes temporarily, only to be frustrated by the speed of change, or burdened by other barriers to continue (time, energy, expense, knowledge).

We may be able to agree that as simple and effective as a change can be, alone or together, small changes are rarely enough to effect a satisfactory change causing the individual to adopt a new habit or create a new identity – even when the opportunity to prevent

or control a condition is within reach. Healthcare providers can be frustrated by a lack of adoption and may be tempted to try more powerful means than a well-intentioned prescription. As a function of provider time (lack thereof) these more powerful means can often include coercion through education, guilt (providers themselves or family members as the source), limiting access to some care until other attributes are controlled (weight loss before joint replacement), force (most often indirect) through payers, and more.

How can the healthcare system truly turn into a "wellcare" system, referred to by Dr. Peter Attia as "Medicine 3.0", where we increase the focus on wellness and improve the success rate of disease prevention? More specifically, how can we be more effective in preventing or mitigating disease expression when oftentimes it is seemingly so close and so obvious? Perhaps the answer does not lie in knowing the body better but knowing the body and mind connection better [3]. In this paper we will review and provide an overview of psychologically-informed practice, complemented by both motivational interviewing and behavioral economics, with practical applications as related to decisions that impact healthspan and lifespan.

Conservative management, outside of medications, injections, and procedures, includes four main pillars of health that impact both lifespan and healthspan: physical activity, social connection; sleep, rest, and play. We will round this list out with a fifth item, intentionally seeking novel or challenging experiences to give us a full gamut of opportunities that patients can apply for themselves.

By the end of this article, practitioners may expect to be able to help their patients make more choices for themselves – a significant step toward precision medicine, as the health seeker's involvement ensures greater personalization. When people make a selection from options that are both scientifically-based and built for them, they are now in an optimal position to mitigate diseases. Impactful societal change comes when people have autonomy to choose what aligns with their beliefs across these five pillars:

- Physical activities that optimize safety and wellness
- Nutritional strategies designed for longevity and function
- Social support providing engagement and purpose
- Wellness opportunities through a balance of sleep, rest and play
- Intentional stressors in the form of novel experiences or extreme conditions (e.g. thermal, exertion, and intentionally challenging experiences) in an effort to remain capable, adaptable, and healthy

Improving patient engagement through familiarity and confidence in the translations of science across the five pillars ***may*** nudge your patients to make healthier choices for themselves. With a psychologically-informed practice, we may be more successful in empowering our patients within autonomy, belief and choice – the ABCs of precision medicine and rehabilitation.

Precision Can *Only* be "Spelled" with Person

Precision medicine is a relatively new term, being first used in association with The Human Genome Project in about 1999. From its earliest existence, precision medicine has been used interchangeably with personalized medicine. The connotations of personalized medicine have been evolving over the past 25 plus years. Arguably, consideration for the individual became more apparent with the introduction of the biopsychosocial model by Roy Grinker in 1952. This model was slow to be adopted until George Engel's writings in 1977 [4]. While oversimplified, The Human Genome Project would have aimed to improve the precision of medicine through one definition of personalized, that being a more thorough understanding of an individual's DNA. In yet another connotation of personalized, the World Health Organization's introduction of the International Classification of Functioning attempted to be inclusive of person-specific interests (roles and responsibilities) [5].

The Power of Autonomy

In one of the most widely-read books and most watched TED Talks on motivation, Daniel Pink, the author of *Drive* postulated three motivators for all human beings, including: autonomy, mastery, and purpose. Pink defines and describes autonomy as, "A desire to be self-directed, it increases engagement over compliance" [6,7]. In healthcare, we want engagement – it is both an active and lasting effect – and thus more powerful than compliance – with tones of passivity.

Across the scientific community, autonomy can be referred to as "empowerment", can be associated with the keywords, "patient engagement", and can be prioritized in approaches that endorse "patient centered care" [2]. Within these parameters, autonomy is discussed widely in pediatrics, maternal health, geriatrics, medical education, and more recently in discussions of gender as well as reproductive rights. In their editorial comments for the 2024 Frontiers in Medicine special edition on health behavior change, Lionis and colleagues described the wide-ranging effects and power of autonomy [8].

In their 2016 article, Wulf & Lewthwaite identified autonomy as one of the three main principles essential in maximizing attention and motivation for people that are developing new skills or recovering motor learning after injury [9]. Their seminal paper introduced the optimal theory of motor learning and infused a healthy dose of psychology to the performance and rehabilitative providers throughout the world. The concept and proofs that followed helped to firmly establish that by providing autonomy one could expect an increase in both attention and intensity. These concepts have both translated and reverberated well outside of the sectors of movement and are now a resonant message for all healthcare and wellness providers to adopt.

While it would be possible to write much more about autonomy, perhaps two salient points in health care and wellness remain. These include the relationship of autonomy to a sense of freedom and to the powerful experience of self efficacy. In their 2010 article entitled "Supporting Autonomy", Entwistle and colleagues express about the power of autonomy as they write, "It suggests that clinicians can respect as well as promote patients' autonomy when they intervene to help them 'stick to' their behavioural goals—especially when patients recognise and own their difficulties and seek or welcome supportive intervention. Relational thinking, giving patients a sense of freedom" [10]. The authors continue, noting that identifying with the preferences of patients, practicing what is known as "relational thinking" leverages autonomy by, "…suggest(ing) recommendations about treatment (that) are more likely to be autonomy-supportive if made by clinicians who: seek to promote patients' autonomy and not just narrow health gain; listen to patients; explain how they have taken personal circumstances, concerns and preferences into account in their recommendations; enable patients to query and if necessary correct their understandings about them; and ensure patients feel they could choose against the recommendation without jeopardising their ongoing care" [10]. These statements embody the freedom attributes of autonomy.

Finally, autonomy through self-determination (ability to control one's own pathway) is related-to and empowering-for the all important attribute of self efficacy both within healthcare and educational literature [11-13]. Self-efficacy, first described by Bandura in 1977, is critical for both wellness and health care [14]. The attribute has been studied widely and proven to be correlated with positive outcomes in cardiology, orthopedics (joint replacement), oncology, and more [15-17].

The Power of Belief

While we are all familiar with the concepts, "placebo" and "the placebo effect", these can be and often are confused for one another. A placebo is an intervention that has no value (therapeutic by surgical, medicinal or rehabilitative effect), yet appears to be (or is represented as) a valid medical treatment. The term, "placebo effect" is undergoing an evolution of sorts as we better understand our true ability to offer a true placebo [18]. The placebo effect was once defined as the effect of believing in a sham treatment. However, the placebo effect is becoming synonymous with the power of belief – no matter if the intervention is staged to be a sham or has value. This power of belief appears to be individualized based on dopamine expression and reception, among other considerations. Meaning, some people have a greater propensity to benefit from the power of suggestion, of belief, than others do.

Neurophysiologically, there are a few main centers identified in the placebo network. While it is oversimplified to give full localizationist "responsibility" to such an interconnected function as believe, those recognized centers in the network include the prefrontal cortex, amygdala, insula, hypothalamus, and the periaqueductal gray. In 2015, Wager and Atlas redefined the placebo effect to be, "…beneficial effects that are attributable to the brain–mind responses to the context in which a treatment is delivered rather than to the specific actions of the drug." The authors went on to write, "(Placebo effects) are mediated by diverse processes — including learning, expectations and social cognition — and can influence various clinical and physiological outcomes related to health" [19].

Belief is necessary in wellness and healthcare. Without belief, treatments that have evidence and should work, or ascribed a nocebo effect – degrading the efficacy of something that has value. We need the placebo effect, patient buy-in, belief in all health-based interactions. We cannot afford to lose this element in efforts to apply precision medicine.

The Power of Choice

The science of disease prevention and mitigation is more powerful than ever. Implementation (long term, consistent adoption), is the problem. We now have more education, fewer work hours/more time for self-help, more gimmicks and life hacks than we have ever held. What is going to move more people to choose better, to adopt evidence-based strategies to extend their healthspan? The approaches that have been used to coerce, guilt, shame, or convince people have been ineffective. These approaches have included more myths about aging than ever, more approaches endorsed by figures of authority, and even more legislative solutions. We have tried these and are barely living longer than we were decades ago.

The solution may be to step back from the unhealthy methods that have been used to induce a change in our society's health habits, including fads, hype, myths, legislation, prescription and coercion. Perhaps we can be more successful in efforts to influence small changes that lead to habits and finally become an identity, "I am a runner", "I am a healthy eater", by providing choice. When we believe in a surgeon, medication, supplement, hospital, exercise program, diet, sleep routine, or even a restaurant…we select "it", we choose it and it works better if for no other reason than the power of choice. Studer, 2025 writes, "Making choices in healthcare and wellness is not easy. People can easily become overwhelmed by having too many options, a phenomenon known as choice burden [20]. Consider an anxious patient that does not know which direction to turn, combined with a strained provider…Providers are experiencing expanding constraints leading to compassion fatigue (some refer to this as burnout) due to reducing time with patients, decreasing reimbursement, increasing liability and litigious culture, as well as a sense of eroding expertise (artificial intelligence internet sources). Perhaps providing patients with a reasonable set of options that are paired-down for (personalized for) them, is a start.". Perhaps providing choice can reduce the burden on compassion fatigue on the provider as well.

Consider your impression of the placebo effect, elevating the benefit of a sham or null intervention, ointment, procedure. What if we were provided with options to make our own choices? Imagine a healthcare and wellness world wherein health seekers were given the opportunity to make choices for ourselves from a menu of a few healthy options to improve our healthspan? How much more healthspan could we realize if we made our choices from scientifically-supported options? Knowing that we have ***choice*** makes the A and B (autonomy and belief) functionally powerful.

Geers and colleagues compare choice and the placebo effect in their 2013 article entitled, "Why does choice enhance treatment effectiveness? Using placebo treatments to demonstrate the role of personal control". The authors conducted four separate tests within this study, in an effort to determine the power of choice, on health-related outcomes. They conclude, "…when individuals desire control, choice over treatment alternatives improves treatment effectiveness by enhancing personal control" [18]. Meaning, choice matters most to those that have agency and prefer to play a role, have a belief, prefer a degree of autonomy.

In this 2024 book, ***The Brain That Chooses Itself: Practical strategies to extend your healthspan***, Studer writes," Two identical environments or conditions will be diametrically opposed in how they are received, when one is chosen, and the other is imposed. [21] Consider the difference that being pushed into a 40-degree pool and intentionally entering a cold plunge. Compare the physical and mental health differences between experiences that are a punishment, versus those that are chosen. These juxtapositions, while similar in many ways, could not be more different in their effect on the body and mind. Examples include forced labor as compared to a volunteer experience of yard cleanup for an injured neighbor. Compare the experience of a fixed dinner with no food options that you prefer, versus having full autonomy to order from options on a menu. Even the time of night that you prefer to go to sleep is a choice that is formed based on your preferences. When we choose, we are voting with our informed minds. We endorse an option. We tolerate directions and selections that we choose, best. This effect is seen in our daily experiences in choosing a driving or running route, a movie, a meal/restaurant, a vacation destination, a social gathering, and more. When you choose and are not forced, you are more likely to experience superior mental health (dopamine vs. cortisol), more likely to persist, or stay with that option, than if it were forced upon you, prescribed for you, legislated, or delivered with the pressure of guilt. Choice increases your consistency, attention, belief, intensity, and engagement –

variables that make any healthy option more effective, healthier, and applied more consistently over time.

When two or more options in wellness or healthcare are equally healthy for you (forms of exercise, diet strategies, bedtimes or medications), the option that you ***choose*** will be more successful because of your belief in that option – Geers and colleagues align choice to the placebo effect – elevating most any outcome. In time, a series of choices made consistently can become a habit and even more permanent still – by creating an identity."

Beyond the work of Geers and colleagues, there remains a paucity of literature on choice across all sectors of medicine, yet the trend is clearly increasing. In 2012, Brownlee and colleagues wrote for the Dartmouth Institute of Health Policy, about choice, relaying, "In order to ensure that each patient gets the treatment that is right for him or her, the choice should be a shared decision, involving both the patient and the clinician. In the process known as "shared decision-making," the patient is a fully informed partner in the choice, knowledgeable about the risk and benefit trade-offs of each treatment option [22]. When performed correctly, shared decision-making results in a better decision: a personalized choice based on both the best scientific evidence and the patient's own values.

Shared decision-making (SDM) is a common phrase that conveys or indicates choice. Brownlee and colleagues' were among the first to begin to underscore the importance, yet under the SDM moniker, choice has received a great deal of attention across the scientific community since. In the past 10 years alone, over 20,000 peer-reviewed journal articles have used the exact phrase shared decision-making searchable through the National Library of Medicine. We are seeing the value of including the health seeker, yet we need practical strategies informing providers how to carry this science out – the implementation of the ABCs may lead the way.

Implementing the ABCs Toward Extending Healthspan

Some of the most conservative measures that can affect healthspan have no copay, no subscription, very few to no side effects, and (often) cost less than their alternatives. Using these parameters, the five main categories or pillars of healthspan and lifespan that are subject to choice include those that we have referenced above, yet are listed clearly here together:

- Physical activity
- Nutrition
- Social connectivity
- Sleep, rest, and play
- Novel (challenging) experiences or stressors

We will detail the opportunities for choice (and therein personalization) as related to healthspan within each of these pillars throughout the remainder of this article. Prior to doing so, it may be instructive to recognize some of the inherent barriers to adoption that have plagued both health seekers and healthcare or "Medicine 2.0 providers", in the past.

Barriers to Adoption: Bias, Misinformation and Myths

Once a disease is confirmed or diagnosed, is it forevermore in existence? Can diseases be eradicated or just mitigated? Is the same true for aging? Are people encouraged to give in to disease and give in to aging, when we don't even clearly understand either? Our society and our experiences may cause us to feel hopeless against disease and aging, a dangerous position that may disincentivize us from choosing healthier options (or actions) because we have "no control". If a person feels that they are genetically predisposed toward a collection of diseases and maladies, then their preferences, their choices and even their efforts, will have no impact. When we have no control, we have no self-efficacy. In the case of aging and disease, each can feel like a permanent label with an expected pathway of deterioration leading to our demise, so, "What's the difference?". Why should we choose? Why should we try? We hold deep biases regarding aging and disease, fueled by myths and misinformation.

Consider for a moment the amount of change we blame on aging, when at least a portion must be attributed to the removal of a healthy stimulus that was maintaining this function. Practically speaking, if our work provided mental stimulation in the forms of project organization, time management, decision making, innovation, recalling sequences, remembering connections and new co-workers…is it any surprise that the removal of this stimulus would lead to cognitive decline? Use it or – lose it.

While the examples of removing a stimulus leads to loss of function could be exhaustive, perhaps it is salient to pose one more, that being strength. We are bound to lose strength as we age, right? What are the two absolute stimuli needed to build strength? Resistance training to a level that causes breakdown, signaling a need for growth hormone to be released. The other? Sufficient and diverse protein intake, representing the essential amino acids. That is it. Just these two stimuli. With aging, but not *because of aging*, people often experience a reduction in one or both of these stimuli on a regular basis. Moving from a two-story home to a single-level home may reduce 10 steps x 3.5 ascents of these steps per day. If a 71 year old does not replace this stimulus – they should lose strength. If a 27 year old experiences the same change – they should lose strength as well! Recliner chairs with a lift feature, elevated toilet and bed heights, reduced participation in recreational activities (tennis, jogging, cycling, swimming are another short list of stimuli removed – some of which are removed as a function of societal expectations. Finally, changes in our roles and responsibilities can influence our exposure to strength stimuli. This can include pushing a stroller, ascending bleachers to watch kids' sports, tending to a garden, vocational activity, and more.

As suggested above, it may surprise most readers that aging is comprised of and influenced by our genetics, our life choices, experiences, perception of aging, and more. With the exception of some maximum capacities/values including nerve conduction velocity, maximum heart rate, and VO2 max, there are very few age-associated functions that cannot be mitigated. Not eradicated or reversed - but mitigated. Those attributes that have greater controllability than previously considered include a formidable list of: strength, force production, muscular endurance, cardiovascular endurance, pain free range of motion, cognitive performance [23].

The mere notion that these processes can be controlled, that our choices matter, is powerful.

A deeper dive on the power of choice can be found in the book, *The Brain That Chooses Itself* [21].

Opportunities for Personalization Within the Pillars of Healthspan

Physical Activity: If Exercise is Medicine – then Everyone needs a Prescription – Right?

The most assured way to depersonalize care is to recommend the same thing for every health seeker. These actions can additionally

lead to compassion fatigue on the part of the provider. There is truth to the consideration that "Exercise is medicine". However, exercise is just as healthy for us in just as many ways as it always has been. We are just *discovering* more of the mechanisms. Exercise, and its overarching umbrella physical activity (PA) can both provide benefits for the musculoskeletal, immune, digestive, psychological, cognitive and genitourinary systems.

Physical activity can realize larger adoption rates across active and inactive communities than what is presently the case. Participating in PA that you like, you love, you need to do, your community or family needs from you – can be equally if not more intense, simply because of your engagement to the movement. Exercise may be "your thing". Yet we miss more than 75% of the adult population in the United States when we make guidelines, recommendations and guilt our most powerful change agents. Physical activity, when performed with intensity, can be equally as stimulating as exercise to release exerkines (proteins with downstream benefits including a long list of benefits including reducing inflammation). At the same time, physical activity can be purposeful (volunteering), giving one a greater sense of purpose (mental health benefit via oxytocin loop). For more information on how to use physical activity to your patients' advantage in mitigating disease or aging with health, some recent research would include the following: (Studer et al.; Golightly et al.; Schlicht et al. and Billek-Sawhney et al.) [23-26].

Recall that we are more likely to make a match with personal preferences when healthy movement can come in many forms. The best exercise for any condition will be ineffective if the health seeker does not "do it", does not like it, or does not believe in it.

The World Health Organization's recommendations for physical activity are often misinterpreted, misapplied, and misunderstood. All exercise is physical activity. Not all physical activity must be "exercise". There is much more movement in our lives that should "count". More movement that is healthy, outside of the time that we have as available to exercise. The farther that we feel away from 300 minutes of moderate intensity movement per week…the less likely we will be to reach toward that goal.

When we see the goal of 300 minutes of moderate intensity movement including a post-meal walk, doing yardwork, pushing a grandchild in a stroller, we may see ourselves as healthier, as capable and most importantly closer to the target. Close enough to try to bridge the gap with some structured exercise, a recreational game of pickleball, an extra walk, or one more outdoor project.

When we choose our best, most convenient, or favorite form of physical activity – it becomes healthier. The act of choosing and following through with your choice can be a big step toward the goal of precision – medicine or rehabilitation. Having the autonomy to choose, creating a belief, and making the choice are the ABCs of health and wellness: autonomy, belief, and choice. In physical activity, these ABCs give our movement more mental health (release of natural antidepressants), cognitive capacity (release of neuromodulator dopamine and cerebral blood flow), and enhance our relationship with movement (reducing pain, increasing frequency, increasing tolerance for intensity).

The physiology of physical activity and related effects to reduce the expression of disease, reduce the risk for many diseases, and improve our prevention of the three primary killers (injury, inactivity and illness) is detailed with references and physiology, in the book, *The Brain That Chooses Itself* [21].

Nutrition Beyond the Hype: Healthy Options for Lifespan and Healthspan

Remind yourself here, that if there were one best diet or approach to nutrition for everyone, that there would be no benefit of choice. In the realm of nutrition, there may never be a consensus, "winner" or best, across the variables of timing and content. We are coming to a consensus regarding high sugar, Ultra Processed Foods (UPFs), variety, and to some extent…what is unhealthy. The agreements consolidate four main concepts in nutrition:

- Adequate protein intake is rare, but critical.
- Consistent grazing is unhealthy.
- Liquid calories are rarely the best method (exception being when this is the main route for protein acquisition).
- We do not know much about our microbiome. It (they, our collective microbiome) does "know" a lot about us. Treat these microorganisms well with fiber, low sugar, and time between feedings.

Personalized nutrition is a developing science, one with room to grow within the subtopics of the microbiome, UPFs, chronotropic feeding and more [21].

Expanding Healthspan Through Personal Preferences in Social Interactions

Unintentional solitude (loneliness) is on par with alcoholism, obesity and smoking more than 15 cigarettes per day [27,28]. We can perform better under stress, deal with unexpected life events, fend off infection, build and maintain diversity of thought, and improve the balance mitigate most chronic diseases (cardiac, metabolic, degenerative) – with the social contact that we prefer (choose).

Our social contact can come in the form of friends, former workmates, significant others, family…and even pets. These personalized options can include consideration for the modes (how we socialize) as well as the volume of socialization (frequency and duration). The pathways for extended healthspan through social connection are broad and wide-reaching, including benefits to our mental health, immune system, cognition, autonomic (heart rate variability) and cardiometabolic systems.

It is often lost in the conversation about the benefits of a health social support network (expansive, diverse, reliable) that we can both gain from *and learn from* our inner circles. In his seminal work entitled, "The Theory of Needs", Harvard professor David McClelland informs us that we improve in cognitive capacities when we have exposure to diverse social networks, through a mechanism that likely exists via expanding our pool of solutions for any given problem [27-32]. Additionally, by living vicariously through the struggles and successes of our social network members, science informs us that we are more tolerant of unexpected stressors in our own lives and can feel more aspirational about our future potential through the same connections.

Optimized Healthspan Through Sleep, Rest, and Play

Nearly every other pillar in this article, depends on sleep. On the matter of recovery from exercise – the number one tool is sleep. One of the leading risk factors for Type II Diabetes, is the inconsistency of sleep-wake cycles experienced in the life of a shift worker. Sleep impacts our mental health and healthy interactions with others. In the related functions of sleep, rest and play – choice (personalization) is a predictably successful route toward precision. Choice comes in many forms here. How we define rest, when we prefer to go to sleep, and our preferred opportunities to be carefree, playful, at times, are all personal preferences.

We gain healthspan and lifespan through rest and play in very similar pathways. Mental health (reduced cortisol), cognitive stimulation (creativity, hemispheric connectivity), improved cardiovascular profiles (blood pressure, heart rate variability), and improved metabolic function (digestion, blood sugar). Both rest and play are individually defined and are truly only healthy in the forms that we choose. While it is rare in some cultures and more common in others, there are some people that prefer not to play at all. Again, this is a choice and should be respected.

Sleep has many unique features when compared to the other four identified health pillars discussed in this article. While there is gain from stressing the system in each of the others (one more repetition, a little faster pace, a little longer between meals, a diversity of social connections) – sleep appears to benefit from consistency, from regularity – not from conformity. When combined with regularity in sleep schedules, personalization is key. People have different circadian rhythms and chronotypes with which many body systems can be trained to align.

The benefits of or returns to be gained from optimized sleep is just too long to even summarize here. A very superficial list includes: recovery from illness and exertion, immune function, preventing degenerative disease, reducing metabolic and cardiac dysfunction, improving mental health, and more [21].

Beyond the Comfort Zone: The Health and Wellness of Choosing Novel and Challenging Experiences

Novel and challenging experiences that can come in the form of exertion, thermal extremes, psychological stress, cognitive difficulty/complexity, and more. Intentionally stressing systems within safe constraints will benefit the brain and body in a multitude of ways. Sleep is the exception. We should not perceive health gains from attempting to sleep in environments that are not conducive in an effort to improve sleep resilience. Cooler temperatures, darker rooms, and less noise should all be healthy for sleep. Outside of habituating for conflict zones in the line of military duty, challenging these conditions to become more resilient should not in the best interest of our health.

While we can all accept that strength training may prepare us to endure or even more effectively stabilize when we encounter an unexpected force (perturbation) such as a grandchild's hug around a leg, a dog jumping up on us, or contact with an opponent in sport. In this regard, strength training can promote resilience – protecting us from musculoskeletal or even traumatic injury (fall) as a function of our resistance training.

We may benefit from extending this "expected stressor training" into other realms, beyond strength. It may be healthy to consider that exposure to psychological stressors, "psychological strength training" in the same fashion as resistance training, endurance exercise, and intermittent fasting, can prepare us for unexpected psychological stressors. Training our mental health using the boundaries of hormesis (just enough exposure to improve us) is grounded in research, which shows that we can do just that – improve our psychological strength. Persons that have endured reasonable life trauma (to the level that can be overcome) will experience future resilience from trauma. As Dr. Victor Carrion suggests, this resilience comes in the form of improved coping skills, problem solving, and seeing their social support system is capable of helping (available and reliable) [33].

How do we arrive to possess a sense of resilience, grit, or self-efficacy though, were it not for thriving and surviving challenging experiences? Developing the belief that, "I can do hard things, face hard times, and I have strong social support" is predictive of mental health and ultimately longevity. The operative word here again, is "belief." The science of *choosing* some discomfort, is an ever-expanding field in the realms of psychologic discomfort, thermal, exertional, and cognitive. Having enough (most any type of resource – food, financial resources, social support) or having access to the same, can be the difference in our willingness to and benefit from subjecting ourselves to periods of intentional scarcity.

A summary of the main benefits of novel experiences follows:

- Brain health (your memory centers, specifically) improves with varied experiences, including intentional exposure to pressured and stressful situations that remain in our control
- Adrenaline, epinephrine, cortisol are equally important to elevate in dosage, when we and how we prefer to do so.
- Heart rate variability (HRV) can be a reflection of total cardiac health and moreover nervous system balance. Emerging science informs us that we can positively influence HRV through our life experiences and training [34].
- Cognitive decline can be prevented in some cases through high-intensity exertion, stimulating the blood-brain barrier with elevated lactate levels. The primary pathways include adrenocorticotropic hormone (ACTH), beta-endorphin, cortisol, catecholamines and cytokines [35].
- Immune health can improve directly through cold exposure-induced promotion of cytotoxic T lymphocytes (combating cancer), the release of myokines, cytokines, the reduction of C-reactive protein (inflammatory biomarker), and reductions in pro-inflammatory cytokines and molecules, including PCG1-alpha as well (reductions in) pro-inflammatory molecules IL-6 and TNF-α [35].
- Cold dosage (mode, totality or percentage of body immersion, duration, temperature and time) is a developing science. The benefits are clear, the prescription is not.
- Low temperatures can additionally have a positive effect on inflammation, glucose regulation, metabolism/thermogenesis, Brown Adipose Tissue (BAT) mobilization, as well as mitochondrial biogenesis.
- Challenging our brain and body to engage in two separate tasks simultaneously (dual tasking) can be among the healthiest interventions to retain or regain cognitive function and automatic skill (procedural memories) [36].

Personalizing the Aging Experience: What Stimuli are We "Learning to Lose"?

We will now attempt to summarize the main points of this article into a final section on personalizing our preferred aging experience. We may not need to all "age at the same rate" for after all, our life experiences, genetic makeup, preferences for lifespan as well as our choices for day-day activities are all different. Some of the main factors in the rate of aging equation have been unfairly blamed on the cellular physiologic processes of aging, rather than our life choices.

When life is too routine and too easy, we can disengage, pay less attention, and potentially commit some uncharacteristic errors. With fewer consequences and less novel stimuli, a brain may be less likely to encode/consolidate new information and make more redundant connections through the night. When we have a less stimulating existence, both pruning (losing connections) and cortical atrophy (reduction in brain volume) become more likely,

just like a muscle that loses bulk with insufficient work. This concept of a "less-stimulating existence" is born out in critical illness (bedridden), economic distress, and childhood neglect, with the evidence being most prolific in animal studies of impoverished environments. Unfortunately, these has additionally been the progressive experience of aging in the United States. What could we expect from "aging" when we engage in fewer responsibilities (work, child rearing, financial management), experience reduced exertional workload (vocational, two-story home, recreational sports) and have fewer expectations (contributing to a conversation, social engagement, meeting new people, recalling routes).

On one end of the pendulum, we see and have read about the science of extreme experiences – both physical and mental health to be gained. On the other end, we see frailty, often incurred due to the singular or combined effects of illness, inactivity, or injury. within physical activity, Opportunities for personalized aging…to keep these stimuli regular and viable can be seen in the approaches of bite-sized dosages (exercise snacks, VILPA, HIIT) within across each the seven parameters of physical fitness: balance, flexibility (pain-free range of motion), muscular endurance, aerobic fitness, strength, power, agility.

The science of brain health includes an understanding that varied experiences (motor, cognitive, experiential) yield gains in neuroplasticity (making connections) as well as psychological health (to be detailed below). A primary principle of neuroplasticity, "use it or lose it," applies here as well. Dual tasking is an optimal example of beneficial stress applied to the cognitive system, wherein a person intentionally (chooses to) subjects themselves to a challenge of continuing to perform two separate tasks at the same time at or near the level of proficiency they performed each in solitude. These challenges are among the most robust interventions for cognitive health with aging and can result in health gains in the attentional and motor control resources of the brain [36].

The science of nutritional health with aging includes efforts to take what we can from the one-size fits all diet recommendations, and choose what suits us best to ensure a "one-size fits this person" nutritional approach. A personalized nutritional approach (not a diet) provides opportunities for choice and variety in the timing of fueling, as well as the full complement of micronutrients, minerals, and macronutrients. Subtopics within the use it or lose it in aging and nutrition conversation include continued exposure to a variety of plants (30 per week), fermented foods, a full complement of amino acids, and (in an effort to keep the diversity of our microbiome) a low-sugar, high-fiber approach [37].

The science of diverse social connections is optimized with opportunities to operate within one's comfort zones (familiar people, preferred group sizes and contexts), yet also opportunities from experiences beyond one's comfort zone. This might include meeting people with differing opinions, being in larger crowds than one had been previously comfortable with, or even being in front of/the focus of a larger group of people. Hearken the notion of "psychological strength training". Research proven benefits include the use it or lose it themes of improved tolerance of future unexpected social stressors, the diverse benefits that emanate from vicarious experiences, the benefits of hearing individual perspectives, and unique approaches to problem solving.

With the throughline of "use it or lose it", here are a few simple applications that may give us pause in how we approach aging for ourselves or advise our patients about it:

- It is healthy to experience our heart's range of rates. If you have not elevated your heart rate to near-maximum…wouldn't it be expected that this upper-end range would reduce such that it is "not there" in a time that we need it? With medical clearance, we know that elevating your heart rate is healthy… just as much as resting your heart rate (as low as it can go) can be healthy.
- If we have not been on the floor in years, when we find ourselves there accidentally…we may be challenged to get back up under our own power. Put yourself on the floor and get back up as a future investment that may take less than 30 seconds.
- There are health benefits in keeping our resilience or tolerance to thermal extremes.
- Head positions can feel awkward, if not dizzying, if we have not experienced them for some time (under the sink, looking upward; bent over, looking sideways).
- Challenge yourself to suspend something in memory. Without the aid of your phone, a written note, or someone else's memory, see if you can recall a grocery list, a set of directions (turns to a destination or the next three steps in assembly), or a few drive thru orders without a second exposure.
- Give yourself permission to experience something novel (flavor), experience a failed attempt, or to experience a surprising win. Novelty, surprise and reward can stimulate endogenous dopamine – which is healthy for your brain's plasticity [38,39].

A common question that arises in the topic of intentional challenge is, "What should I do when I try to extend myself, but fall short of my goals, or 'fail'?" This is an excellent question, an experience that should not keep us from striving, as it can extend the rewards experienced with "a win". This phenomenon is known as the "near-miss effect" has been studied widely and proven to be a reliable circumstance to promote dopamine. The effect is as the name suggests, a desire to persist because the last trial was nearly a success. Prescott and colleagues studied this closely and carefully with a robot model within a food-foraging simulation in their 2024 paper, and Peterburs and colleagues found similar reinforcement of the effect when studying healthy adults and predictions in a gambling context. Even though it's counterintuitive, consistent wins do not produce as much dopamine as the anticipation and surprise of a possible win.

We will conclude this section by summarizing the health benefits emerging from intentionally challenging ourselves to tolerate extremes: thermal, physical (exertion), situational (mental; distraction or novelty), and psychological (pressure or consequences). Consider the practical examples of intentionally seeking out (choosing) extreme experiences, and the health benefits in return. Each of these have personal "weights" to them, being a challenge to each of us, but here goes:

- One more repetition of a resistance exercise
- Volunteering to do a math problem in front of class
- Intentionally practicing falling
- Trying to re-learn how to play an instrument after decades away
- Visiting a foreign country, and attempting to speak the language
- Running for office
- Talking about our fears, anxieties, or compulsions
- Competing in a spelling bee
- Re-entering school in a wheelchair for the first time after a traumatic injury

Wellness Through Intentionally Challenging Experiences – A Deeper Dive

Readers that are interested in the science of novel experiences may choose to pursue more information on this topic. The most comprehensive coverage on the health benefits of subjecting ourselves to challenging, novel or extreme experiences is available in the book, *The Brain That Chooses Itself*, summarized here with these seven principles [21]:

- Many physiologic processes are triggered or initiated by a temporary condition of hardship; tap into these – they are often free, safe, and efficient
- Thermal exposures: Extreme cold will stimulate changes in the central nervous system promoting alertness (catecholamines) and enhanced executive function
- Tolerating a challenge (temporal, thermal, psychological, exertional) and thriving can promote the release of dopamine and serotonin
- Intentional exposure to full-body, prolonged heat (20 minutes) by hot tub (104d) or sauna (168d) can imitate the benefits of aerobic exercise
- Succeeding by achieving a new personal best or tolerating uncomfortable conditions that one intentionally invites can provide tolerance for upcoming, unexpected uncomfortable situations (tactical training, health challenges)
- Hormesis. There may be an ideal dosage for each individual in immune health, mental health, physical fitness, and cognitive aptitudes. Too much of a given stimulus can be poisonous, toxic, or harmful to the level of breakdown - while too little (being shielded/protected) from the same stimuli can leave someone with an inexperienced immune system, less grit, or limited endurance [40,41].
- Neuroplasticity (connections formed in the brain in response to learning) begin to associate sensations (how we feel), perceptions (how we feel) with activities and events. With experience and repetitions, these associations can become prominent (think hard-wired)

Leveraging the Science of Choice (and applying this Knowledge)

Science informs us that change in the realms of our health and wellness (physical activity, diet, sleep, socialization) may more likely to be adopted when [41-45]:

- There is less friction
- The new method or option is nudged or seems convenient, easy to apply
- We receive reward (gamification, praise, or sense of wellness/purpose)
- We believe that this approach is built for us (personalized)
- We perceive ourselves to be improving (ideally supported by objective measures, more so than opinion)
- The novel activity or change seems playful (for some), experimental (for others)
- We are "in this" with people like us (social connectivity)
- We chose the change for ourselves (autonomy, separate from belief in something prescribed for us)
- This is a loss-aversion "win" (this option would be preferred to "doing nothing" and risking loss (aging, disease process, opportunity no longer available)

The following list of maxims and principles is intended to help the practitioner in any health field pull together some of the most effective opportunities to personalize in efforts toward precision care. This list with short summaries that follow may give the reader an opportunity to both become familiar with and to pique interest in (for further introspection) any of these arenas ***that compel your patient or customer*** to achieve the best version of themselves. Table 1 provides additional practical examples on many of these concepts.

Table 1. Principles of Behavioral Economics Applied

Principle	Definition	Example
Gamification	Converting something that is normally not game-like, into a game by tracking points, levels, rewards/badges, or streaks	Tracking a streak of days without fall, incontinence Personal best weight, repetitions, or steps/day Meeting or exceeding an age + gender norm Lab values now within normal limits
Commitment devices	Variables that increase the likelihood of completion or attendance	A workout partner that will surely be waiting A bet placed on your own performance Stating aloud a goal that you will achieve
Habit stacking	Pairing an activity that is *necessary* with one that is less-desirable (must-do with new activity)	Balance exercises while standing in line Squats while standing to brush teeth Isometric trunk contractions sitting in meeting Heel raises on an airplane
Temptation bundling	Pairing a *desirable* activity with one that is less desirable (reward with new activity)	Watch dogs play as a destination for long daily walk Blending greens into a healthy and tasty smoothy
Nudge/eliminating friction	Making a choice easy by availability and convenience (removing friction)	Donate now, your credit card is already out Automatically opted-in to be an organ donor Low or no copay for the recommended medicine
Loss aversion	Motivation derived from a desire to maintain current possessions, function, status	Physical activity to keep endurance Stretching to prevent injury recurrence Dental hygiene Puzzles, languages and games to "keep memory"

You Cannot Move What You Did Not Measure

This "measure and move" relationship is often attributed as a quote from one of three persons, in a few different versions. Scientist Lord Kelvin, investor W. Edwards Deming, and the educator/consultant Peter Drucker have all been credited with some version of this maxim. No matter how it is written and no matter the source, there is a great deal of truth in the sentiment. Find your inner passion for healthspan by choosing an attribute to measure. Then try to beat that measure, repeatedly. That is the essence of gamification. If you have chosen an attribute that cannot be improved, or is bound to erode, then use the angle of preservation, known as loss aversion. Nobel prize winning economist Dr. Daniel Kahneman is credited with some of the initial discoveries on loss aversion and game theory [46,47].

"Thanks for being there for me, I could not have done it without you!"

Some people benefit from the presence of a friend that will be at the gym, track, or pickleball court. This is a commitment device. Additionally, stating aloud, "By this time next month, I will be able to walk to the mailbox without stopping.", can motivate some toward elevated consistency and intensity. This phenomenon of a friend that is counting on us is often referred to as a commitment device. It can additionally be experienced when we place a bet (monetary or otherwise) on our future performance. Consequences matter and can shape our actions.

Don't Let Perfect Be the Evil of Good

This is a very popular maxim in business, that is less frequently leveraged in matters of health and wellness. Perfection can be paralyzing. Waiting for the perfect time to start a new habit may seemingly never arrive. There is wisdom in the order of operation as follows: measure – effect change – re-measure and then implement a more comprehensive approach. No matter whether you are talking about sleep hygiene, physical activity, or eating better…there is nearly always, "a little more" that you could be doing. Leaving more variables to change in the future can help your self-efficacy and (bonus) keep your body from plateauing quickly by adapting to the new normal.

The Easier (it is to Work Harder) the Better

Nudge is a powerful force of attraction. We are more inclined to pursue (and continue with) activities that are "within reach". This "within reach" concept can mean geographic (proximity – the gym is minutes away), temporal (clothes already laid out, healthy foods already prepared), or financial (this is the most comfortable *and* least expensive new mattress).

Hard work can have a degree of friction, however. While it is understood that we arrive at our best shape, physically and mentally, through the intentional and occasionally very difficult work that we do to improve, the thought of the stressor can serve as friction, rather than a nudge. Intentional hard work can come in the forms of reshaping habits, committing to healthier lifestyles, and consistently investing in preparatory work to hone a skill, capacity, or talent. We are more likely to stay the course when this work is convenient (easy, nudged), tempting (rewarded or accomplished with others), and satisfying (rewarded just frequently enough to see the gains). Table 2 provides real-life examples of these three principles (easy, satisfying, attractive) in physical fitness, sleep, nutrition and social connections.

Table 2: Making New Health Habits More Likely

Health Parameter	Easy	Attractive	Satisfying
Physical Fitness	Walking path nearby Home gym, bike	Significant other or friend group is planning to join you in the event or workout	Seeing regular improvements My movement is helping others (volunteer work opportunity)
Nutrition	New recipe with few steps Subscription to healthy food delivery service	Colorful advertisement (TV, grocery)	Favorite flavors AND healthy
Sleep	Schedule agrees w partner	Environment feels and looks healthy	Welcoming, cozy place Measurable improvements (tracker)
Social Connection	Best friends, similar likes Good friends live nearby	Everyone agrees (politics, religion)	Social cohesion (others like me)

Appropriate credit due to James Clear at this point (and for the following two principles) as well as the foundational principle of "nudge" from Dr. Richard Thaler and co-author Cass Sustein, 2008 who do not have similar tables, yet whose work inspired this table with their themes of nudge and friction [41,45].

The Reward Cycle: Nuances of Precision and Personalization

James Clear's second principle is "obvious." When an option is more obvious, it may feel easy to make the choice, even satisfying to feel a clear pathway. We can find clear (obvious) choices in small ways throughout our day [41]. These might include the route around a pothole on a run or drive, a shorter line, a lunch special, or even a matching shirt-pants combination in our closet. In healthcare decisions, we may yearn for a clear, best option. Providers can offer the best options, built for you, from which you can choose. Sometimes the choice comes in order of operation – which can also feel empowering just to decide whether you want to start on the treadmill or bike. Make healthy choices easier to access and obvious (bedtime programmed as lights on timers shut off, physical activity opportunities because the resistance band is in your pocket, nutritious food that now just needs to be warmed. As you may note in your life, obvious choices are most usually easiest and can also be both satisfying and attractive.

Satisfaction…is in the Eye of the Beholder

When we are confident in our choice (easy/obvious), satisfaction can enhance the reward cycle before we have started (a night's sleep that you look forward to, your favorite exercise partner, a healthy and appetizing meal). In contrast, some experiences turn out better than we expected. Consistent with personalized care, we know that people have different outlooks and expectations. While it would not be fair to characterize anyone as "always" optimistic or "always" pessimistic, these themes largely persist. People that expect less or even expect a failure may receive a level of reinforcement through a feedback loop that can occur *after* a surprisingly engaging event. This "better-than-expected" sensation can happen to people of all persuasions on the optimism vs. pessimism spectrum. Being pleasantly surprised can lead to improved recall of the association and create a lasting memory. This difference between expected and reality may be referred to as the Reward Prediction Error, yet another powerful topic for further discovery in your patient-provider interactions [48,49].

Habit Stacking

Most people feel that they are as busy as they can handle, related to Parkinson's law. Essentially, we tend to take up all of the time that we have. In an effort to adopt a new and healthy habit, some people would benefit by leveraging habit stacking. Habit stacking can make a choice more convenient and more approachable as an activity that is less likely to be chosen can be combined with a daily activity that must be done.

One example of habit stacking that has a growing volume of scientific support, is Vigorous Intermittent Lifestyle Physical Activity (popularized by Stamatakis et al., 2021 and extended with colleagues Pang et al., includes moving intensively and briefly throughout your normal life actions [50,51]. A few more examples of habit stacking (some being VILPA, others more accurately referred to as an exercise snack) follows:

- Raking your leaves intermittently, faster
- Seated heel raises while in the waiting room or passenger seat
- Using a resistance band/loop between flights, during flights, on the bus
- Isometric contractions of your trunk muscles while watching TV
- From standing, retrieve a sock from the floor, don it and do the same for your shoe. Get dressed and work on your balance

Temptation Bundling

Temptation bundling includes a new activity that is not yet a habit, being rewarded. If a daily walk is not part of your after-dinner routine, but you would like to make it so for the purposes of better metabolic health, a temptation bundle may include a nightly ritual to walk over to a local dog park because you love to watch dogs interact with one another. Temptation bundling makes something arduous or undesirable, more attractive. Pick up a newspaper on your run. Watch the sunrise from a vista reached on your walk.

Availability Bias

One of the most common human errors in making a timely choice, is the misconception that an opportunity or solution will always be available later. This notion is known as availability bias. Our health and wellness opportunities will not always be "there" or available for us to choose. For a society most typically becomes less active with age, our chances for illness and injury increase [24]. When it comes to making commitments to healthier choices, we have all succumbed to inertia and decided (at times), to act by modifying the "seize the day" mentality and substitute an adage like, "There's no time like the future."

Removing Friction

Removing friction is yet another inherent principle that is included in nudge. Making a health related choice easier can be accomplished through geographic ("The gym is so close.") and temporal proximity ("I can get a few extra steps in right now."). These attributes are positive traits that can make a choice more likely, again leveraging human tendencies known as behavioral economics. Choices can additionally be made more likely by removing the friction that serves as a barrier between you and the option. Examples of removing friction can be seen in offers that include "No gym membership for the first two months of the year" or "I will drive us there, you can wake up on the way…".

Loss Aversion

Essentially, loss aversion is a principle that speaks to the natural tendencies of humans to prevent all controllable forms of errors, erosions or reductions. In this article, you have read about loss aversion as related to the investment principle applied to strength training earlier in life to offset forthcoming age-related losses. Within these three contexts, you have seen the outlines of loss aversion. In each, please note that loss aversion can be leveraged when you, your patient, or your family member is having difficulty finding a source of motivation.

Loss aversion can be misused or overused toward fear mongering. This is quite easily seen in the healthcare and eldercare settings where it may be tempting to change behavior through fear: "If you try to walk on your own, you are going to fall and break a hip, or worse.". This should not feel like a healthy statement and is a misuse of loss aversion. Similarly, smoking cessation or addressing alcoholism can include comments that feel like fear mongering, or even threats. As we have seen and will continue to read throughout this article, choice is important for consistency and new habit formation (longevity).

The Endowment Effect or "Effort Paradox"

We place a higher value on the health attributes that we have worked to achieve – biomarkers, scores, and measures such as body weight, fasting blood glucose and blood pressure. When we have earned these new health levels, it is more likely that we will hold onto them and value them, as a function of this principle known by either term, "the endowment effect" or "effort paradox". Scientists point to these features as key differences between a "fixed fast" route of surgery, an "easy" approach of using a medication, contrasted with the persistent gains achieved and valued from consistent effort over time.

It is important to reinforce the relationship and distinction between loss aversion and the endowment effect. See below.

Loss Aversion: Preventing age-related declines in cognition, strength, endurance with the investment principle. Motivating one to contribute to their health and create a reserve or redundancy.

Endowment Effect (or Effort Paradox): The sense of elevated value placed on health after recovering from a long illness or surgery.

Combining the two, "You worked hard to earn this level of fitness – be proud – and work to keep it."

The Fresh Start Effect

One of the most powerful principles in the application of behavioral economics for health and wellness choices, can be

the fresh start effect. We are all familiar with the common versions of this principle, realized with New Year's resolutions, decisions for a life pivot after a milestone, and even choices made after an unexpected medical event.

In each example, we see that the fresh start effect provides permission and a nudge, if you will, to make a wholesale change. This could include: a change in identity ("I am going to become a happy person"); a change in diet ("I have eaten my last donut ever!"); a change in physical activity ("Once I retire, I am going to take up Tai Chi again"); or even a pivot to participate in extreme experiences ("Once I turn 60, I am going to try skydiving").

Most commonly, these sentences are self-directed, as we saw in each example. However, a respected family member, caregiver, or health care provider can use the Fresh Start Effect with a well-intentioned reference that is offered with autonomy, like this, "Would this be a good time for you to invest some time in your endurance to prepare for the upcoming knee replacement? I would be happy to help you find some pain-free continuous exercise options." Readers are directed to Dr. Katy Milkman's book, *How to Change: The Science of Getting From Where You Are to Where You Want to Be* and listen to her podcast, *Choiceology*, for more information [53].

Conclusion: The Science of Choice Applied in Aging – A Deeper Dive

Seeing and stating aloud what you plan to do and prefer to do, does help. The science of commitment devices takes this one step further and includes such examples as people placing an actual wager on what they will do. In some cases, this involves real risk and the loss of real money.

Commitment devices may compel a person to use the strategies and "pull the levers" listed in this article. These motivations commonly include some sort of loss aversion, such as "I don't want to lose this money," or "I don't want to be wrong (and embarrass myself)." Loss aversions can be powerful motivators, yet can feel punitive to some, even cause resentment, or not last a lifetime. However, adopting an identity can be positive and long-lasting. Evidence tells us that when we adopt an identity, we are more likely to make choices that are consistent with our identity. Meaning, start with, "I am a person who will"…and finish with these statements, as they are written, or worded as you prefer:

- Consistently choose physical activities to optimize safety and wellness
- Choose healthier options and portions to gather needed energy
- Surround myself with diverse people to expand my social health
- Optimize wellness through a balance of rest and activities with people, in places that feel healthy
- Expose myself to conditions in the form of temperature, exertion, pressure and novel experiences in an effort to remain capable, adaptable, and healthy

We now understand that adopting an identity for yourself is powerful. Again, we benefit most when we have autonomy and are making a choice. We opt-in. Choosing your identity does not mean an "alter ego" or another persona/personality. Dixon & Dweck help us to see that adopting an identity can be accomplished by merely iterating a growth-mindset affirmation [53]. Research has demonstrated that there are health benefits to be gained when one declares an identity, stating that they are, "a non-smoker" or "a person who eats healthy foods," or "a runner," or "an active person." They have essentially branded themselves and will be more likely to make choices consistent with their brand [54].

Life includes many choices. Every time that you are faced with a health-based choice (nutrition, activity, rest, social and challenge/extreme), you have the opportunity to follow your identity, or not. When the choice that you make agrees with your identity, this serves as a long-term reinforcer of your ultimate behavior. This concept is layered and deep, but very simply reinforces the brain-based connections that limit your temptations for donuts, alcohol or cigarettes, for example. You receive a very simple and reliable chemical reward for making "the right choice".

Adopting an identity strengthens the connections of neurons and will make it more likely that you make that choice again in the future. Additionally, not having that donut, as time goes by, will reduce your desire for that which you had craved. It is important that you are aware of a few of the other powerful and most common strategies that can both get you – and keep you – on track. While the principles of gamification, commitment devices, habit stacking, temptation bundling, nudge/eliminating friction, and loss aversion describe nearly universal human tendencies – precision cannot be spelled without person. It is helpful for Providers to become familiar with the science of human decision making and motivation (known as behavioral economics) in efforts to discover each person's unique motivational tendencies. As noted, for additional depth on these concepts, please refer to Table 1, or the references provided.

Providing patients with the autonomy to make their own decisions, a choice, from a base of evidence, can be more powerful than a prescription, coercion, or forceful education. Giving each decision maker an identity, agency, and a role in their healthcare team can improve engagement and prove to be empowering. We expect three positive results from this reframed approach at wellness and healthcare. These include:

- Improved self-efficacy, which has a powerful effect on most outcomes.
- Elevated autonomy, which can provide a boost to most outcomes.
- The permission to commit, to believe in a plan, which additionally can have a powerful effect on most outcomes.

I can change = self-efficacy
I get to decide, my decision matters = autonomy
I think this would be best = belief

There is a distinct difference between choices that we make with full autonomy (free choice) and those that we make with limited or a singular option (forced choice). When we have autonomy and free choice, selecting from a few options or deciding not to make a choice…we have less cognitive stress, and less stress experienced throughout the body (physiologic).

Perhaps with this pivot, we can help more people achieve wellness, and reduce the need for health care, reduce the length and incidence of disability, and feel more empowered to control how they age.

Disclaimer: The author is not recommending that the reader take risks or suggest patients take risks with your safety or health by engaging in, or increasing the dosage of, any extreme experience. Each person's medical history, biologic tolerances, and psychosocial history should be considered before deciding on your own if an experience is both safe and healthy for you.

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