Behavioral economics of commitment devices – experimental analysis of demand and efficacy in the domain of physical activity

Why do we sometimes fail to do what we know is good for us, like exercising regularly or maintaining other healthy habits, even when we truly want to? **Behavioral science** identifies two primary **causes** of this common problem: our **tendency to give in to short-term temptations** and the **time inconsistency of our preferences**. This project explores one promising **solution from behavioral economics**: **commitment devices**. These are "tools" that people can use voluntarily to help themselves stick to their goals. Examples from daily life might include setting a rule not to buy sweets during the week and deciding on a "self-punishment" for breaking it, or announcing a goal in front of friends to feel accountable for following through. In **our research, we focus on more formalized versions of such tools** – for example, pledging money that is lost if one does not follow through on a goal, or entering a lottery that offers rewards only if the goal is achieved, while also showing participants what they missed out on if they failed.

The **goal of this project** is to understand **how such tools work, for whom they work best**, and **how they can be designed** to be both **effective and attractive** to users. While commitment devices have been used in some public health and medical contexts, little is known about the underlying behavioral mechanisms that make them effective. From an economic perspective, we also know too little about how individual traits, such as motivation, confidence, or risk tolerance, influence the decision to use these tools, or how their design can be optimized to **maximize impact** while remaining **fair and cost-effective**. These questions are especially relevant in public health, where even modest increases in physical activity, like walking more or exercising regularly, can significantly reduce the risk of many major chronic diseases.

We will examine **two types of commitment devices**. The first, *deposit contracts,* ask individuals to commit a sum of their own money that they only get back if they reach their goal. This uses the natural tendency to **avoid losses** to encourage behavior change. The second, *regret-based lotteries*, do not require a deposit. Instead, participants are entered into a prize draw. Those selected receive monetary rewards – but only if they have achieved their goal. Importantly, even participants who didn't meet their goal are informed about what they could have won. This feeling of "what might have been" triggers **anticipated regret**, which has been shown to be a **powerful motivator**. **Lotteries** draw on well-known **cognitive biases**, such as overestimating small probabilities, making them psychologically engaging and potentially more appealing than their expected value would suggest, as our earlier research indicates.

To study these tools, we will combine a **large-scale online survey** with **real-world economic experiments**. First, we will conduct a **discrete choice experiment** (DCE) – a survey method commonly used in economics – to learn how people value different features of commitment tools. We will also collect information about personality traits such as confidence, motivation, and willingness to take risks, to see how these influence people's choices. Then, we will conduct two **field experiments – randomized controlled trials** (RCTs), which are the gold standard for testing the effectiveness of behavioral interventions. The first will focus on gym attendance among (on average) younger adults; the second will target daily walking (steps) among (on average) older adults. Participants will be **randomly assigned** to different versions of commitment devices, and their behavior will be tracked using gym or step-counting apps on their smartphones. We will also collect **follow-up data** after the intervention ends to examine whether the effects are **sustained over time**.

The project will generate **new scientific insights** into the **economics of self-control and precommitment**. We aim to understand the demand for commitment tools, their effectiveness across different types of people, and which versions offer the best balance of user appeal and behavioral impact. The results will contribute to **academic research in behavioral economics**, especially when it comes to self-control and habit formation. The results will be shared through scientific publications and will offer evidence-based recommendations, helping decision-makers and practitioners design better, more personalized strategies to promote healthy living.