Fibromyalgia and irritable bowel syndrome are examples of chronic pain conditions with different profiles regarding pain experience as well as cognition. For both, symptoms management/treatment require effortful and long-term lifestyle changes (such as engagement in exercise or changes in diet) with uncertain outcomes. These treatments are often life-long (need to keep exercising/avoiding certain foods) and have short-term costs, such as increased effort or pain, with delayed benefits, such as an improvement in pain and/or function but only after many months. It can be difficult to want to undertake exercise when you know it will hurt or that the effort will increase fatigue or if you cannot be sure to how the dietary restrictions are going to affect you. Unsurprisingly, many people stop engaging with these treatments, with reduced clinical benefit reflected. This low adherence was typically assumed to be due to low levels of motivation. Our work is questioning this assumption. We are exploring whether having pain affects the way we make decisions related to delayed, effortful, and uncertain outcomes.

In a preliminary study, we found evidence to support altered decision making. We collected information from a large group of 654 participants to compare decision-making between people who have chronic pain (pain lasting at least three months) and controls who did not have chronic pain. We used self-report questionnaires to evaluate how both groups valued delayed and effortful rewards. We found that people with chronic pain were more likely to devalue larger delayed rewards (e.g., prefer to receive $31 today rather than $85 in 7 days) and had a greater preference for reward without effort (e.g., prefer to receive $11 with no effort, rather than climb 3 flights of stairs to receive $80). This suggests that people with chronic pain have different attitudes towards delayed and effortful rewards compared to those without chronic pain. We want to understand whether this change in decision-making is adaptive (e.g., helpful to prevent flare-ups) or over-protective (e.g., causing avoidance of activities when it isn't relevant). That is, what if your brain was keeping you in bubble wrap? To answer this, we need to know more about how these decisions work in the real-world and relative to each individual's own capacity (ability to exercise).

Our project will evaluate decision-making attitudes related to delayed, effortful, and uncertain outcomes in people with fibromyalgia, irritable bowel syndrome, and a group of pain-free individuals at the behavioural and brain levels. We will also investigate the role of emotions and bodily sensation perception (e.g., how accurately you perceive heart rate) in decision-making. This will help us to understand how the body and brain communicate during decision-making. In contrast to our past study, we will use real-world tasks in which participants will be choosing to perform exercises (e.g., pressing buttons or performing memory tasks) to obtain rewards. In this way, we are going to assess real willingness to endure effort, delays, and uncertainty to obtain gains. Further, we will use a task that is scaled to an individual's capacity (e.g., ability to move).

If people with pain still exhibit altered decision-making in these real-world tasks that are appropriate for their current capacity, this suggests that decision making may be over-protective. This is key to understand because there are known interventions that can target decision making, but these are not currently being provided to people with pain. Our work will also help us better understand if it is the physical or emotional aspects of pain that contribute most to these decisions because this will influence treatment options.