The role of classical and operant conditioning in the origin of subjective and physiological pain experiences

Each day hundreds of thousands of people worldwide experience pain coming from the damage of their body tissues. As they recover and inflammation recedes the pain perception also diminishes until it finally disappears. Sadly, this is not the case for approximately 30 per cent of patients whose recovery process does not entail the elimination of pain. On the contrary, non-specific pain persists, which engenders a lot controversy over pain treatment methods. **Since fixing a body which is already fixed will not reduce the pain then what treatment should be applied? What is the mechanism behind persistent, non-specific pain?**

This project is an attempt to answer these questions. Recent findings on pain treatment indicate the need to define and somehow separate the two independent processes – pain perception and nociception. Nociception is transmission of signals to the central nervous system that tissues were damaged (unconditioned stimulus) while pain perception is the ultimate reaction of nervous system (unconditioned reaction). According to classical conditioning neutral environmental stimuli surrounding the nociception could be subject to classical conditioning. As neutral stimuli would be associated with unconditioned (nociceptive) stimuli, then they should gradually become conditioned stimuli and thus evoke pain as conditioned response. **Should this hypothesis be confirmed, classical conditioning could be the mechanism behind non-specific pain syndromes.** In the course of this project a series of associations will be presented to participants. Visual stimulus will precede pain perception while lack of such stimulus will cue tactile perception. In the final stage of the experiment the same tactile stimulation will be applied irrespective of the accompanying visual stimuli. Were the pain to follow the appearance of visual (conditioned) stimuli it would confirm the hypothesis about pain perception as a conditioned response to conditioned stimuli. **If this is the case, the main direction of pain treatment should be to identify and consequently eliminate conditioned stimuli experienced by patients in pain.**

Operant conditioning includes numerous accounts of pain perception as a learned behaviour the likelihood of which increases together with potential benefits it entails. Recent popularity of behavioural theory of pain proves that such model has attracted significant attention in scientific communities, however **it has not been supported with sufficient experimental research**. Arguably, behavioural therapy of pain should not be freely applied without deep understanding of the mechanism underlying the medical disorder which is subject to the therapy. Is it certain that pain is a learned response? Healthy volunteers participating in the experiment will be exposed to operant conditioning with series of pain stimuli. Those who report increase in pain behaviour will be rewarded (positive reinforcement) while decrease in reported pain will trigger punishments. **If the learned pain perception remains despite the fact that the stimuli are no longer painful, then the theory of pain as a result of operant conditioning will be confirmed**.

Both experiments were designed to verify whether two distinct learning mechanisms can be responsible for sustaining the pain of unknown etiology. They will include behavioural assessment (subjective pain assessment) as well as physiological assessment (autonomic arousal). In order to design effective therapy, it is crucial to understand the mechanisms underlying the pain of unknown etiology.