Temperatures were individually calibrated using an adaptive, randomized procedure, as described in previous work (Atlas et al., 2010). Participants rated stimulation on a continuous, numerically anchored visual analogue scale (VAS) from 0-8 (0 = no sensation; 1 = non-painful warmth; 2 = low pain; 5 = moderate pain; 8 = maximum tolerable pain). During testing, we applied temperatures calibrated to elicit levels of low pain (VAS rating = 2; *M* = 40.71°C, *SD =* 2.83), low-medium pain (VAS rating = 4; *M* = 43.11°C, *SD =* 2.33), medium-high pain (VAS rating = 6; *M* = 44.3°C, *SD =* 1.60), and high pain (VAS rating = 8; *M* = 47.25°C, *SD =* 1.31).

During the infusion period on each run, participants experienced 18 thermal pain trials: 3 high pain trials, 6 high-medium trials, 6 low-medium trials, and 3 low pain trials. The infusion period began with the first trial and lasted 13.5 min per run. As described below (“Behavioral analysis”), we included all trials in our analysis, and controlled for temperature. Stimulation was preceded by a 2-sec auditory predictive cue (a pure tone of 500 or 1000 Hz) that gave information about the upcoming noxious heat intensity (as in Atlas et al., (2010)), and a 6-sec anticipatory delay period. Participants rated perceived pain immediately following pain offset on every trial.