The Neural Circuitry of Sweaty Palms: A Neuroimaging Meta-Analysis

Authors: Sydnie Toler & Derek Wenger
Advisor: Dr. Ben Allen
Department of Psychology, The University of Tennessee, Knoxville

Background
- Palm sweating is a sympathetic nervous system response controlled by a network of cortical & subcortical brain regions known as the Central Autonomic Network (CAN).

Methods
- Compiled a list of neuroimaging studies that report brain activity associated with sweaty palms (16 studies, comprised of 251 participants).
- All of the reported brain regions were projected onto a standardized brain template, shown below as activations & deactivations:
- Used activation likelihood estimation to determine nonrandom clustering of activated & deactivated regions associated with sweaty palms:

Results
- Sweaty palms are associated with activation of the insula & dorsal cingulate cortex, both of which are hubs of the salience network.
- Sweaty palms are also associated with deactivation of the precuneus, a major hub of the default mode network.

Conclusion
- This meta-analysis showed that sweaty palms, and thus, autonomic nervous system activity is associated with activation of a brain network involved in attentional control (i.e., salience network) and deactivation of a brain network involved in day-dreaming / introspection (i.e., default mode network).

Knowledge Gap
- Previous meta-analyses have identified individual brain regions involved in the coordination of autonomic responses.
- No studies have examined how these regions are functionally connected to the rest of the brain.

References