

Research Assessment #13

Date: January 10, 2022

Subject: Social decision making in autism: On the impact of mirror neurons, motor control, and imitative behaviors

MLA Citation:

Khalil R, Tindle R, Boraud T, Moustafa AA, Karim AA. Social decision making in autism: On the impact of mirror neurons, motor control, and imitative behaviors. *CNS Neurosci Ther*. 2018 Aug;24(8):669-676. doi: 10.1111/cns.13001. Epub 2018 Jul 2. PMID: 29963752; PMCID: PMC6055683.

Assessment:

I wanted to research the mirror neuron system (MNS) because it plays a huge role in a person's socialization capabilities, and in particular is impaired in people on the autism spectrum. When examining autism, it is typically characterized by an impairment in communication and social interactions and thereby can be detected at an early stage by signs such as imitative behaviors and lack of attention to faces. I find autism to be so fascinating as no one person with the disorder is similar. Autism is a spectrum, meaning that people's functioning capabilities as a human differs from patient to patient. Moreover, the MNS is implicated in neuropsychiatric disorders, which is an avenue I am deeply intrigued by.

A malfunctioning of the mirror mechanism is an underlying factor of the cognitive deficit in autism. In essence, the MNS plays a huge role in action understanding, which made sense to me why autistic kids sometimes don't understand basic social cues. When comparing infants with autism to infants with mental retardation, infants with autism looked at each other and oriented their names less. Moreover, when more testing was done, researchers found that Autism patients'

motor neuron systems responded to observed actions when they could identify in some personal way with the stimuli (Khalil et. al). I found it not to be surprising that autistic patients responded to familiar stimuli as opposed to unfamiliar, as I would suppose that familiarity would ease their mind. In terms of brain activity, the brain region of autistic patients became active during finger movement and even more so during finer movement by a separate individual showing that they match observed actions onto an internal motor representation of that action (Khalil et. al).

Moreover, patients with autism have a deficit in learning motor actions, yet they have no trouble in identifying the goals of specific motor tasks, which I found to be surprising. I wonder why they can not perform certain motions but can identify the outcome people want out of tasks? On the other hand, autistic patients could not identify why people were doing certain tasks. I can't really wrap my head around how they can identify a goal associated with a task but not the motivation behind the task. In my head, it seemed like those two components would go hand and hand together. Also autistic patients have trouble identifying how tasks are performed. This came as not a shock to me as I already knew people on the spectrum had a deficit in their motor capabilities, so it seemed clear to me why they wouldn't understand how to do various tasks.

All these tests are so captivating to my understanding, because they are tests I can potentially perform myself for my upcoming final product project. I can come up with similar experiments and mirror these studies as well. The MNS is also impaired in people like serial killers as they lack empathy and social cognition, which is another area of research I would like to study.