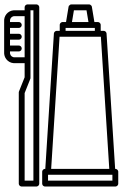
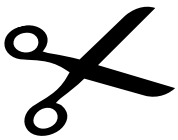
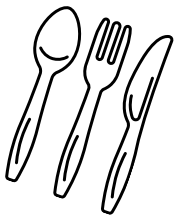
Department of Sport and Health Sciences
Chair of Human Movement Science





Start:
October/ November 2023

Looking for a **master thesis**?
Fascinated by **TMS**?
Interested in **apraxia** research?



Using a key to open a lock, a pen to write down some notes or a spoon to eat a soup - all these activities include the correct handling of a tool and play an important role in our daily lives. **Apraxia** represents a severe health issue, which is associated with impairments in these daily activities. It often occurs as a consequence of **stroke** or **neurodegenerative diseases**.

Besides the proper recall of **semantic knowledge** also **mechanical problem solving strategies** (MPS) play an important role in tool use performance. Whereas semantic knowledge includes information of how, when, where a tool was used in the past, MPS allow to relate physical properties of a tool to its recipient. In order to investigate an individuals' ability to apply MPS, tests were generated, including **novel, unfamiliar tools**, that do not allow to build bridges to past tool-related experiences.

Previous research focused on the identification of brain regions, involved in tool use performance. A mainly left-lateralized network, called **praxis representation network** (PRN), including widely distributed regions in occipital, parietal, frontal and temporal areas, was reported relatively consistent in past fMRI studies.

A prior fMRI study conducted at our chair, was also able to identify activated brain areas in response to a novel tool use task. As fMRI data does not allow to infer causal relationships between a stimulus and localized brain activity, TMS could additionally help to elucidate the causal role of different brain areas in those novel tool use tasks, including MPS. By applying an **inhibitory TMS protocol**, we want to investigate the role of the **ventral**, **ventro-dorsal** and **dorso-dorsal** stream in a **mechanical problem solving task**. Answering this question provides important insights into the **neural correlates** underlying tool use performance in healthy individuals, which are further relevant for an increased understanding of impaired tool use performance in apraxia.

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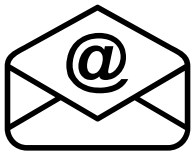

Does this sound interesting to you or do you have further questions?
Looking forward to your email!