

Of numbers and other uncertainties – Benford's bias as a window into the processes underlying embodied decision making?

Project description: Understanding the principles underlying decision making under uncertainty, i.e. with the information available to form a decision being incomplete or changing over time, has been in the research focus of psychology and economics for decades. However, in everyday life, we regularly make decisions about actions to be performed, e.g. deciding to cross a street or not in the presence of upcoming cars. Though, motor decision-making under uncertainty has not yet been widely investigated, yet. Importantly, motor decision making research has proven powerful in investigating the cognitive and motor processes underlying and evolving during the process of decision making, by analyzing kinematic characteristics of the executed movements. However, while this line research was able to link changes in motor behavior to experimentally induced changes in environmental and task conditions, predicting the dimension and extent of these behavioral changes, based on the characteristics of environmental and task constraints, has not been realized, yet, as a formal description of changes in decision uncertainty, induced by changes in environmental and task conditions, remains a methodological challenge. In the planned research project, a well-established psychological decision bias, namely Benford's bias for number estimation, will be used to overcome this challenge. Thus, this project aims at establishing a formal link between the psychological theories of decision making under uncertainty, in the context of number estimation, and empirical evidence on uncertainty-induced changes in movement execution stemming from the field of human movement science. The outcomes of this project have the potential to advance theoretical reasoning in the context of embodied decision making in both psychology and human movement science, by integrating scientific methods and findings.

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