



**University of
Zurich** ^{UZH}

Department of Economics – Neuroeconomics Seminar

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Multinomial logit processes and preference discovery: outside and inside the black box

We provide both an axiomatic and a neuropsychological characterization of the dependence of choice probabilities on time in the ***softmax*** (or Multinomial Logit) form, and we are able to separate the time-independent utility parameter from the time-dependent accuracy one. The Multinomial Logit is a very popular model of random choice in many fields of decision making, from Quantal Response Equilibrium theory to Discrete Choice Analysis, Marketing, Psychophysics, and Neuroscience. Our axiomatic characterization of softmax permits to empirically test its descriptive validity and to better understand its conceptual underpinnings as a theory of agents' rationality. Our neuropsychological foundation provides a computational model that may explain softmax emergence in human behavior and that naturally extends to multialternative choice the classical Diffusion Model paradigm of binary choice. As we discuss in the paper, these complementary approaches provide a complete perspective on softmaximization as a model of preference discovery, both in terms of internal (neuropsychological) causes and external (behavioral) effects.