Selfish, unethical, and short-sighted decisions lie at the heart of some of society’s most pressing problems, but it is still unclear why people so often struggle to make good choices. Here, I show how a simple neurally-informed computational model of choice can generate novel insights into a wide range of difficult choices that are thought to depend on self-control, including healthy eating, altruistic choice, proxy decision making, and moral behavior. The model makes a number of specific predictions, borne out by behavioral, EEG, and fMRI data, about how the brain constructs values for self and others and how such values can promote either success or failure in resisting temptation. It inspires new analytical methods for exploring the dynamics of choice and suggests a need to refine popular competitive dual-system models of choice in light of computational model predictions. Finally, it points to new ways to help people make better choices for themselves and others.