

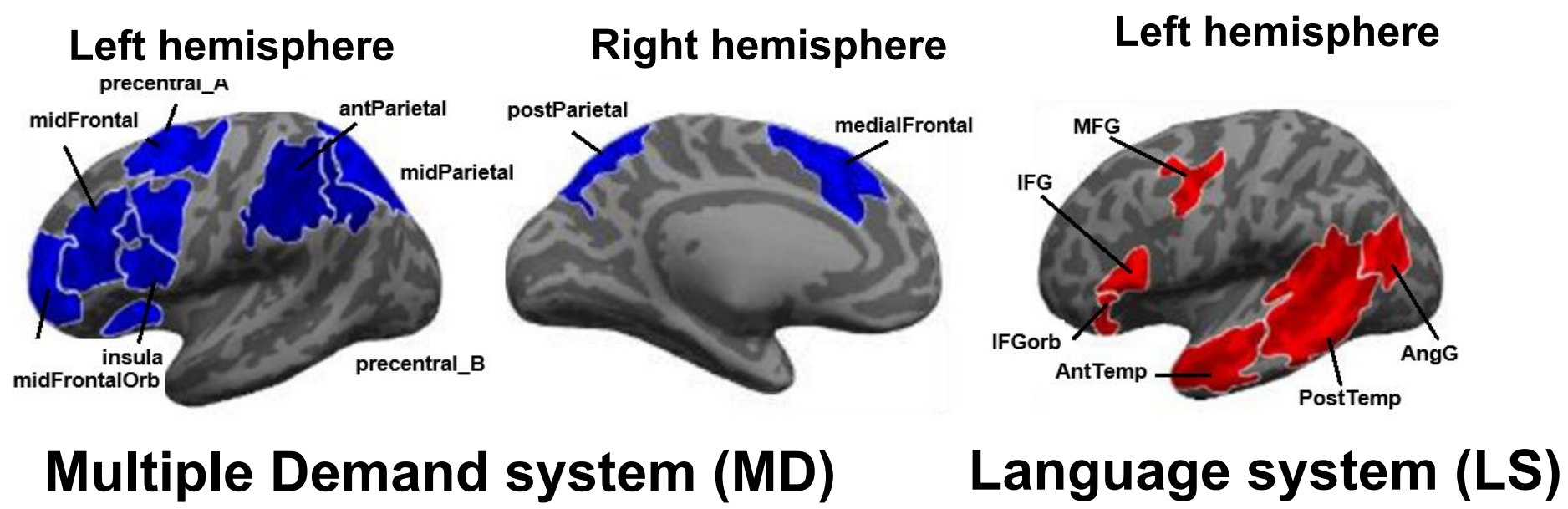
Convergent Representations of Computer Programs in Human and Artificial Neural Networks



Shashank Srikant* Ben Lipkin* Anna Ivanova
Evelina Fedorenko Una-May O'Reilly

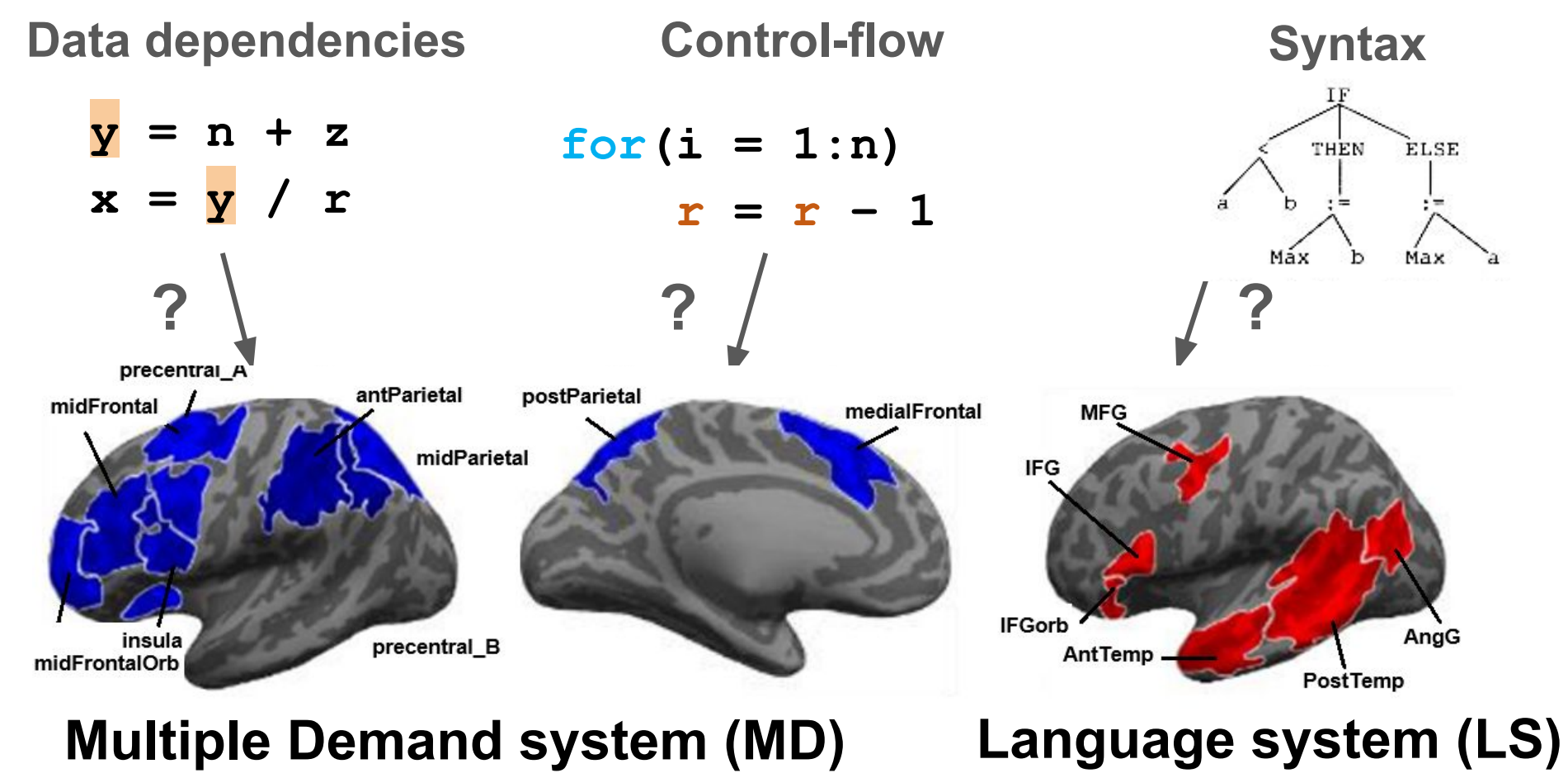


Brains \cap Code comprehension

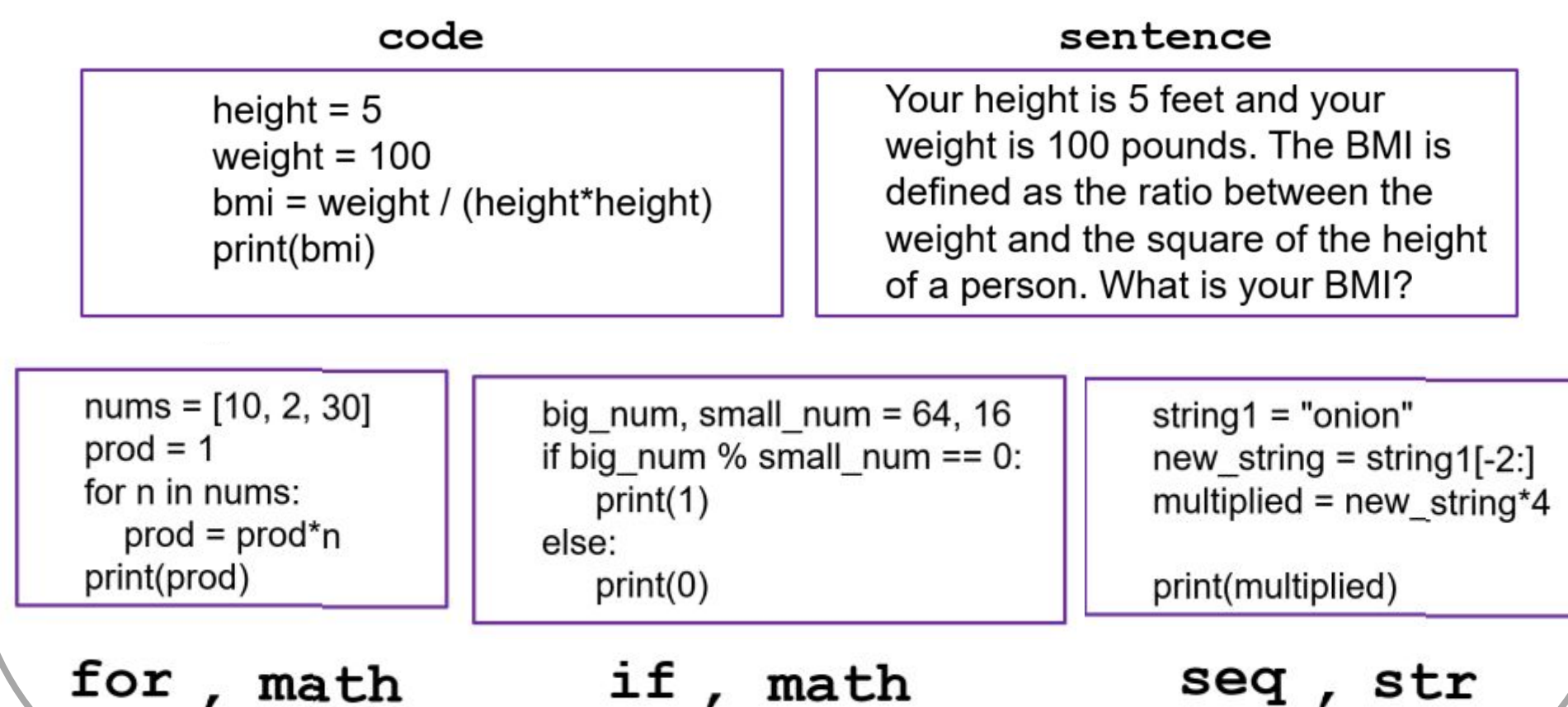


From Ivanova et al. 2020:
MD consistently activated during code comprehension;
LS inconsistent

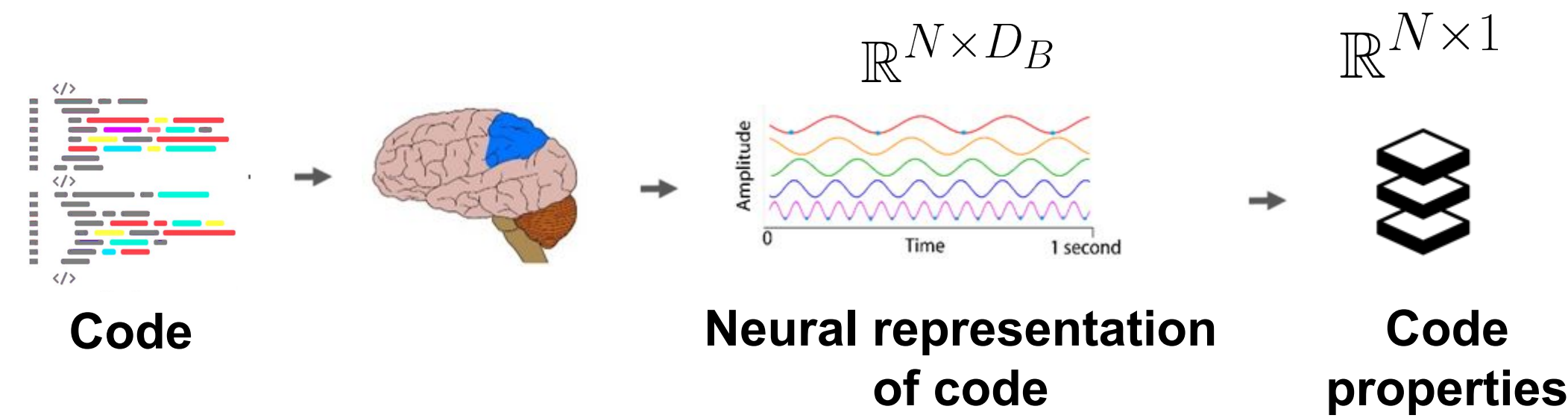
Is it possible?



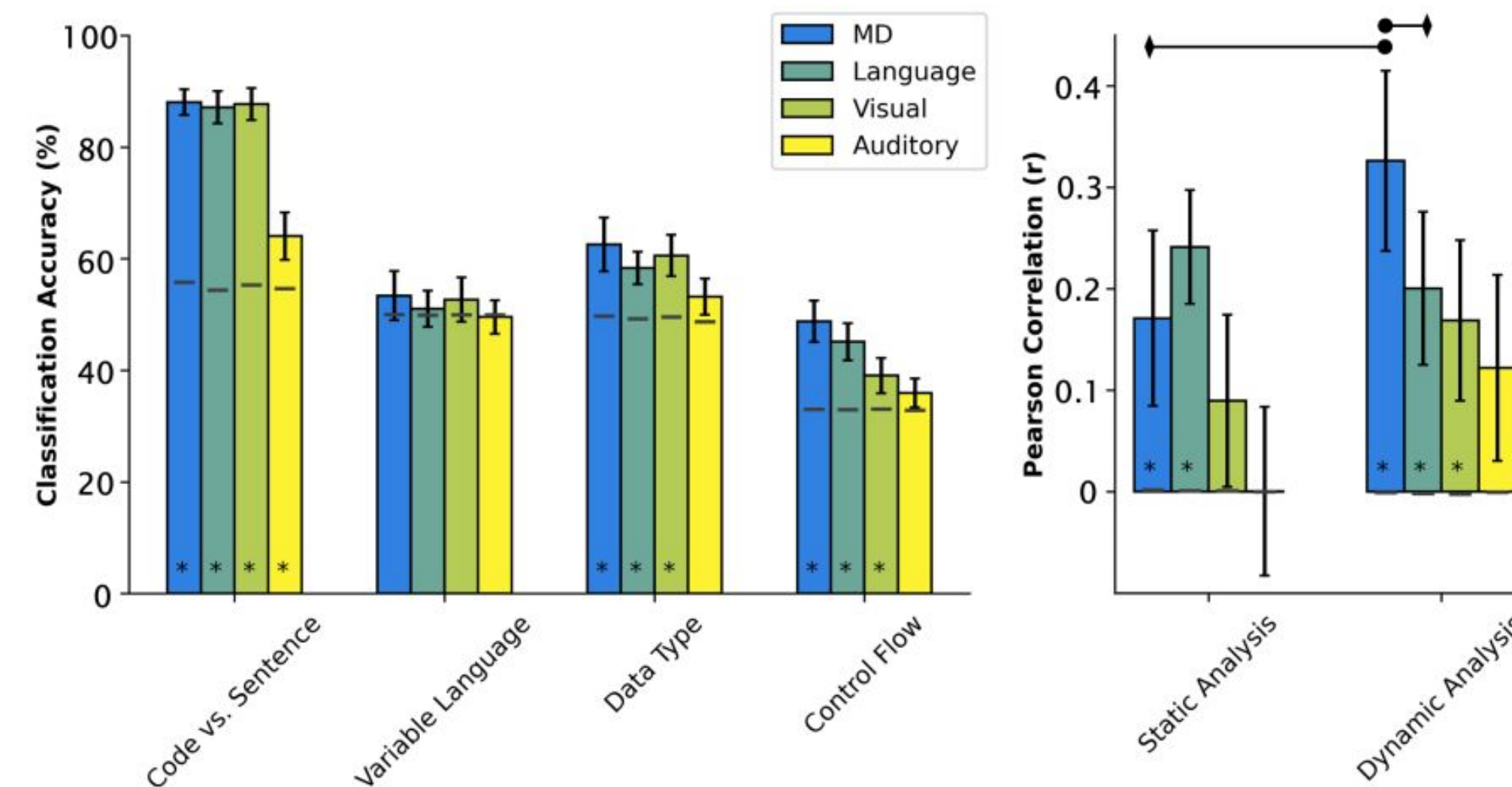
Programs from our stimuli set



What code properties do brain representations encode?



Results

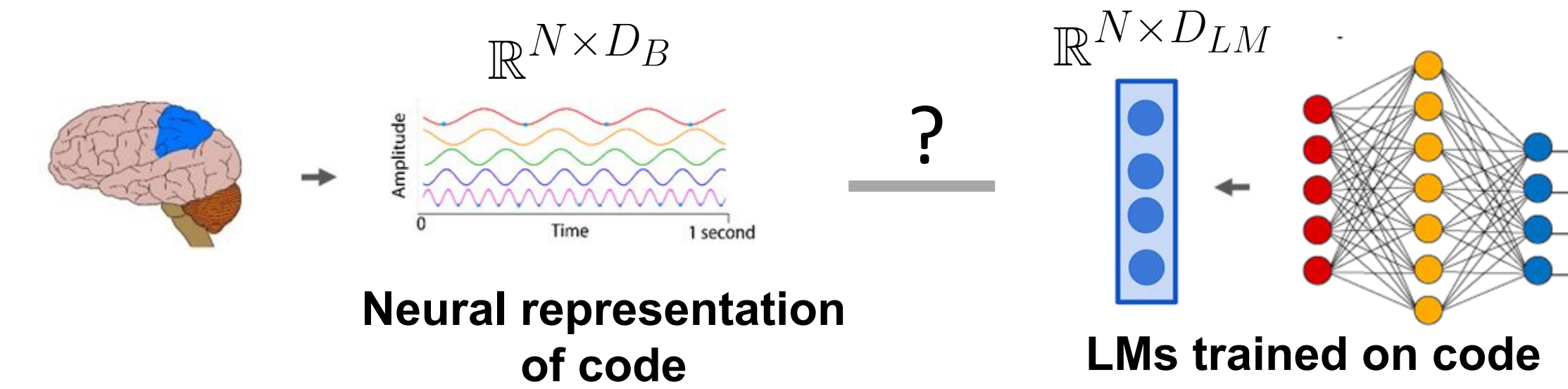


	Control Flow	Data type	Static Analysis	Dynamic Analysis
MD > null	+	+	+	+
LS > null	+	+	+	+

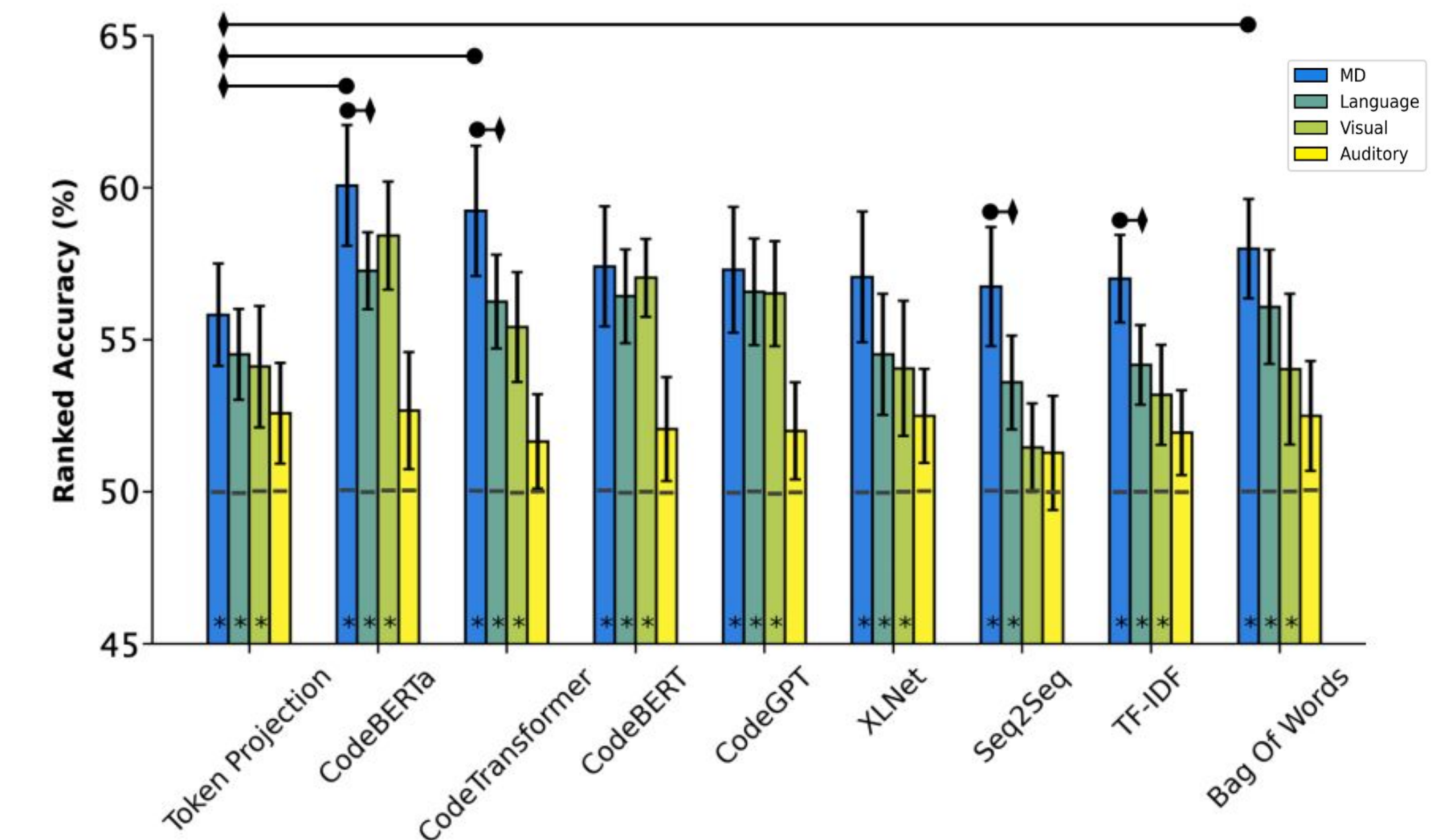
	Control Flow	Data type	Static Analysis	Dynamic Analysis
MD > LS	-	-	-	+

Are there more properties which are encoded in these brain systems?

How similar are machine representations and brain representations?



Results



	Token Projection	TF-IDF	seq2seq	CodeBERTa
MD > LS	-	+	+	+

Picture so far

code, contact

