

a Screening PD from health questionnaires

Question 1
Do you feel that your life is empty?

Patient 1	<input type="radio"/> Yes	<input type="radio"/> No
Patient 2	<input type="radio"/> Yes	<input type="radio"/> No
Patient 3	<input type="radio"/> Yes	<input type="radio"/> No
Patient 4	<input type="radio"/> Yes	<input type="radio"/> No
Patient 5	<input type="radio"/> Yes	<input type="radio"/> No
⋮		
Patient n	<input type="radio"/> Yes	<input type="radio"/> No

Missing

1) Questions skipped by participants



Questionnaire 1

Q31: Did you have difficulty falling asleep each night?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Occasionally
- ☐ Never



Questionnaire 2

Q72: In the past month, have you had trouble falling asleep when you went to bed at night?

- ☐ A lot
- ☐ A little
- ☐ Quite a bit
- ☐ Not at all

Machine learning models

2) Same question asked differently

b Quest2Dx – language modeling of questionnaires for PD screening

Questions (e.g.)

- From age 80 and up, hours/week of moderate physical activity
- Did you have difficulty staying asleep?
- More problems with memory than most?

Answers (e.g.)

- 1-4 hours
- No entry
- No

Question encoding

Answer encoding

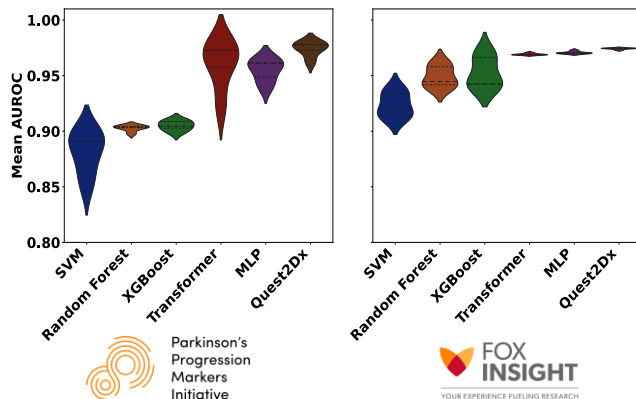
Learnable representations

Missing token

Language Modeling and Classification

PD Non-PD

c With-in Questionnaire Evaluation



Cross Questionnaire Evaluation

Datasets		Mean AUROC [95% CI]
Source	Target	
FOX INSIGHT		0.945 [0.910, 0.981]
	FOX INSIGHT	0.980 [0.970, 0.991]

d Key Questions Identified

Over the past week, have you usually had troubles handling your food and using eating utensils?

Over the past week, have you usually had trouble getting out of bed, a car seat, or a deep chair?

In your lifetime, have you used other solvents or degreasers 100 days or more at work?

e Reduced Questionnaire

