L'impact de la synaptopathie sur le codage des voyelles

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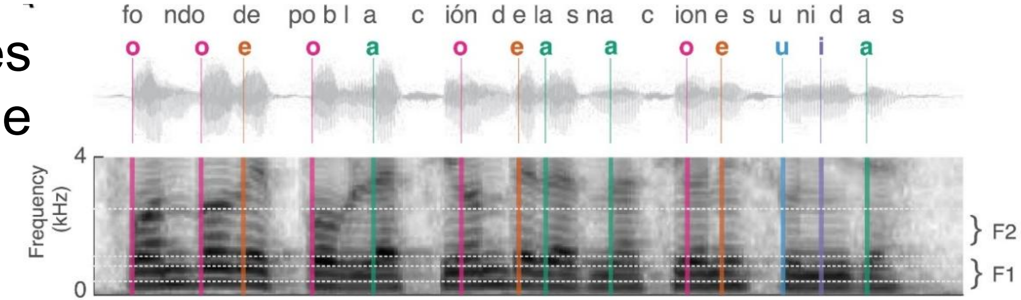
Institut des Neurosciences de Montpellier

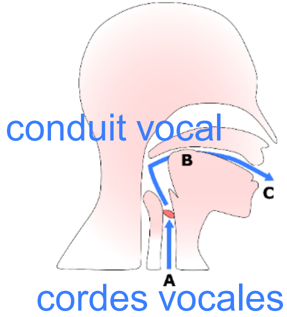
Pourquoi les voyelles ?

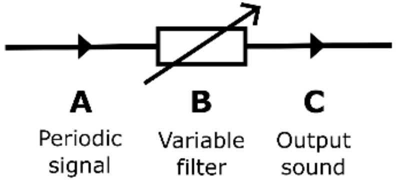
1. Présentes dans toutes les langues parlées du monde

Oganian et al., *Neuron*, 2023



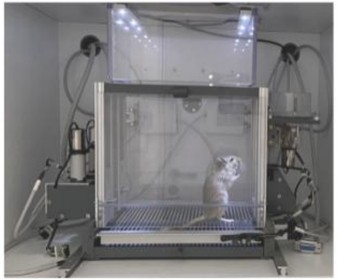
2. "Relativement" simples à modéliser

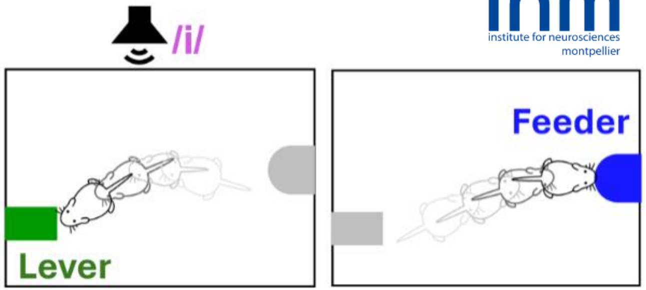




3. La gerbille "entend" les voyelles

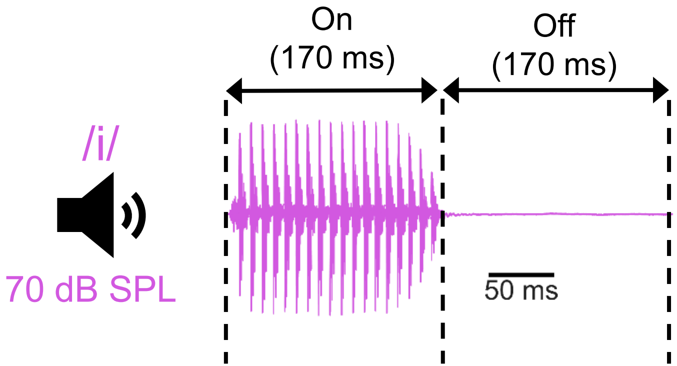
Jüchter et al., *Hearing Research*, 2022





inm institute for neurosciences montpellier

Caractéristiques acoustiques

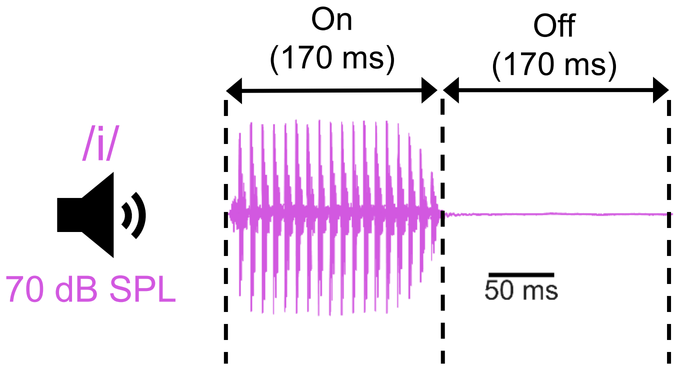


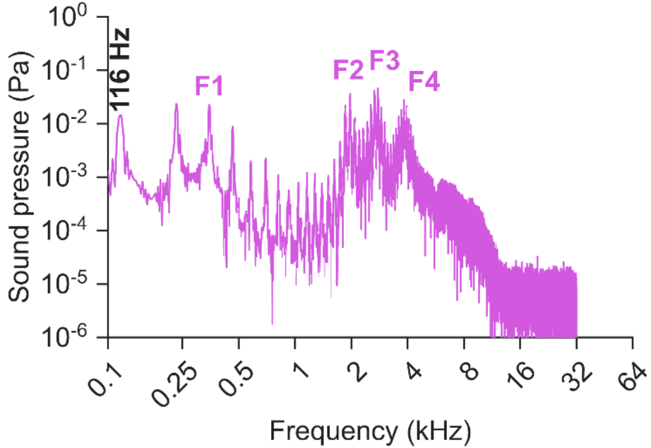
Etienne Gaudrain

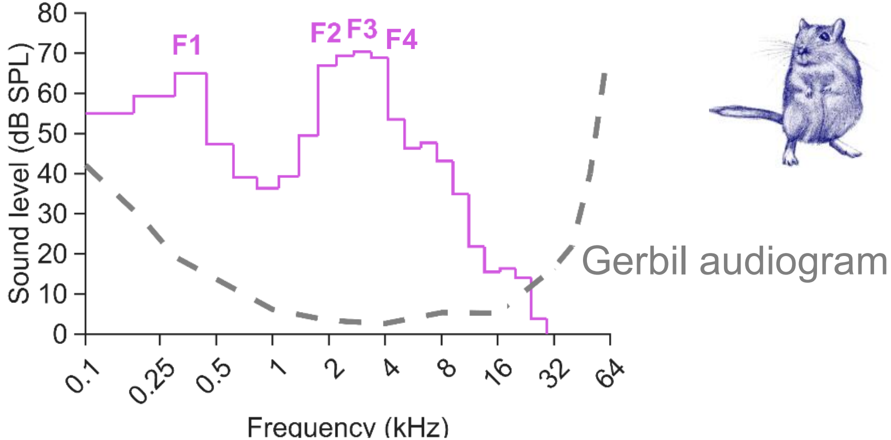
neuron

CoSySpeech

Caractéristiques acoustiques







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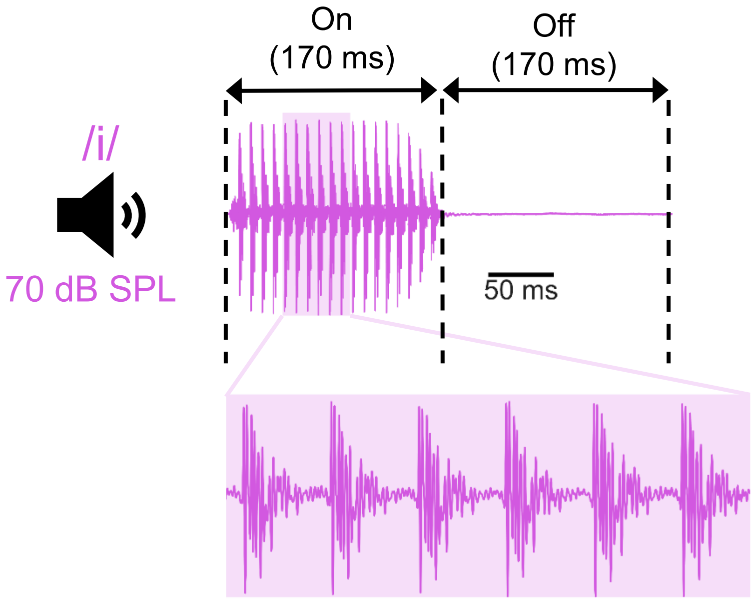
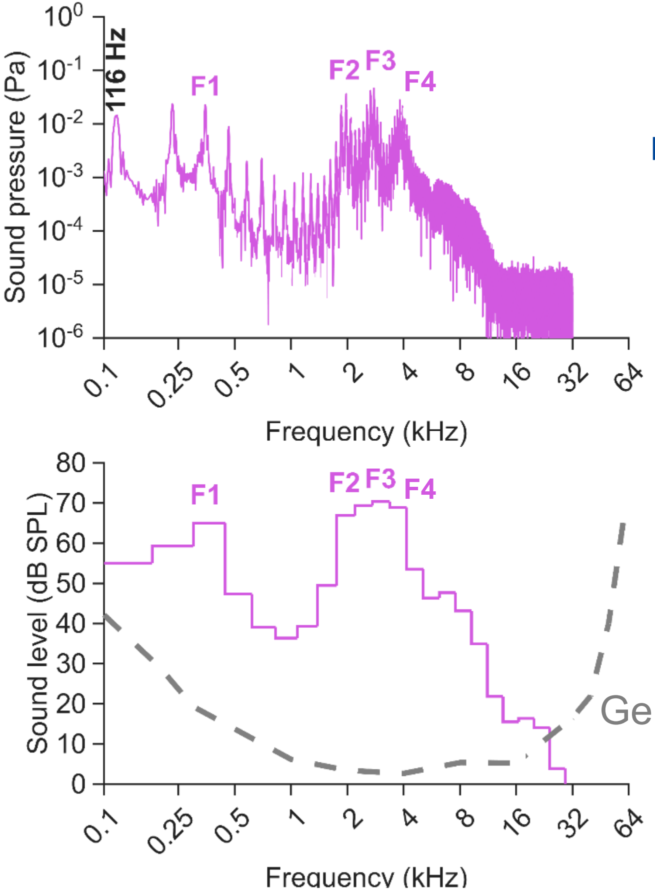
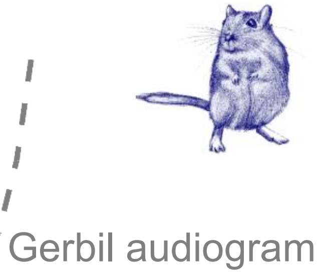
CoSySpeech

Caractéristiques acoustiques







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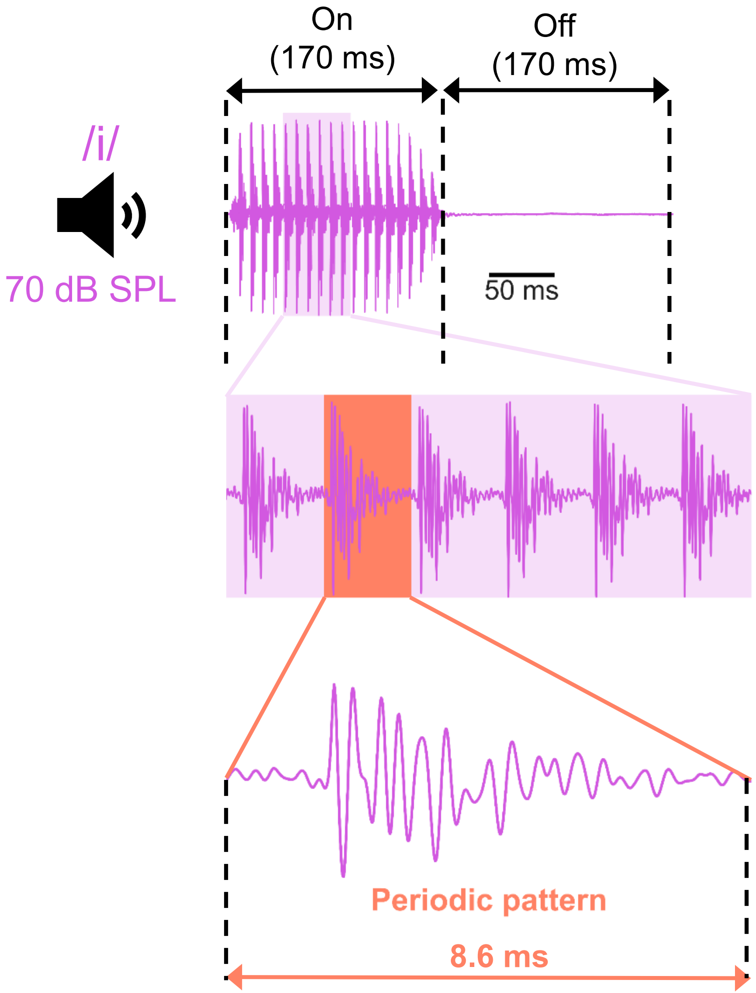
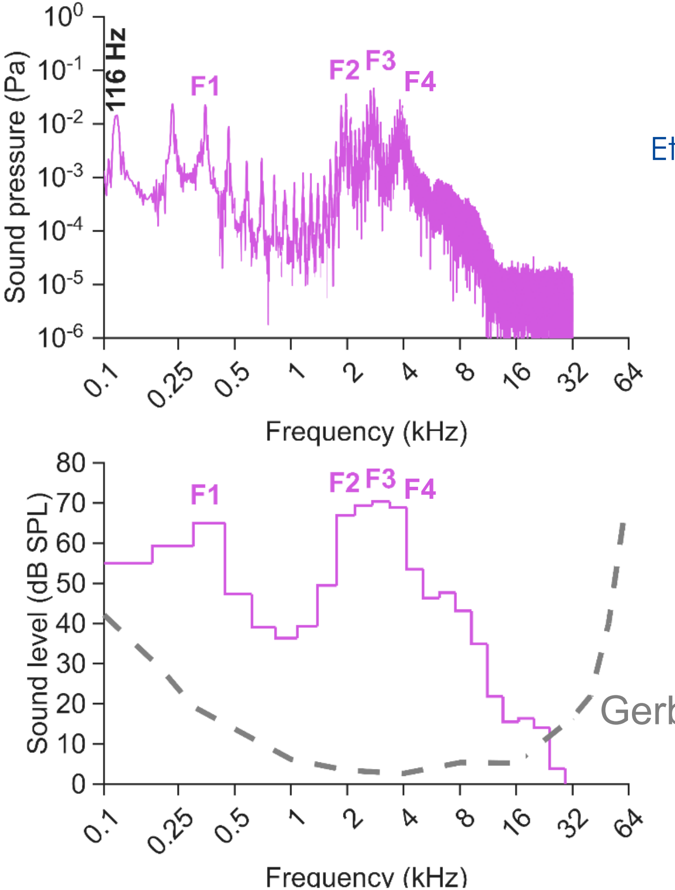
Caractéristiques acoustiques





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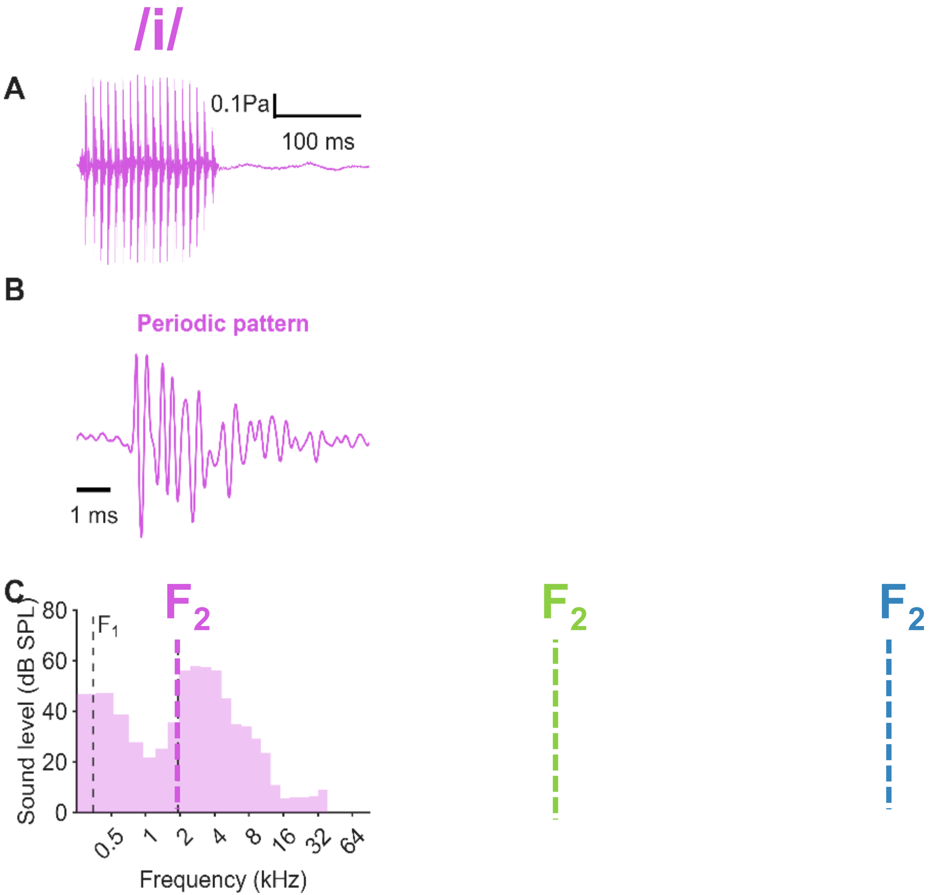
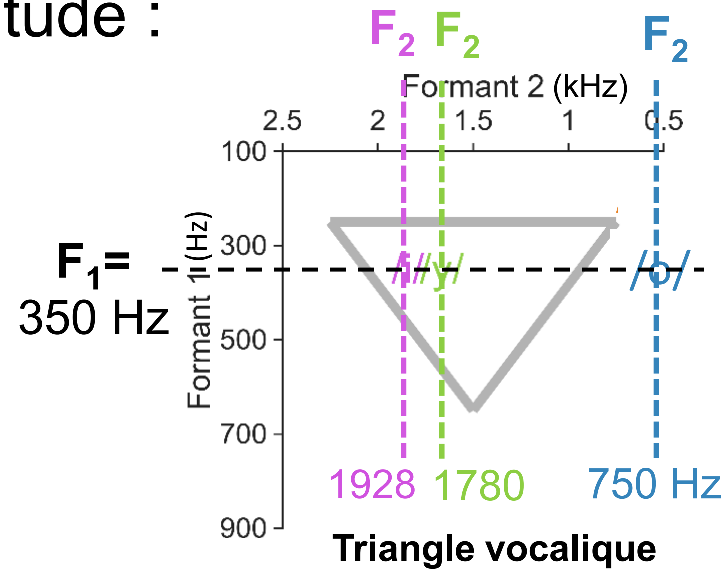
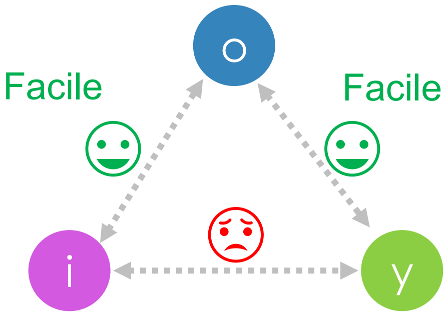
Les 3 voyelles de l'étude :



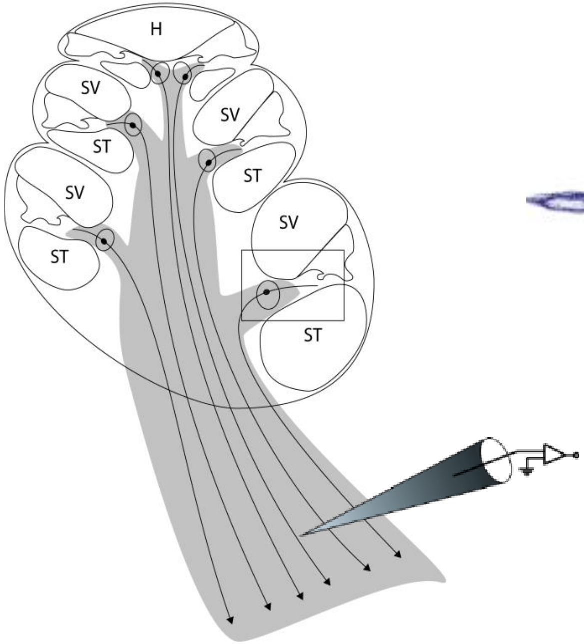


Hypothèse de travail



Difficile à discriminer

Résultats



Gerbils

n = 246 fibres

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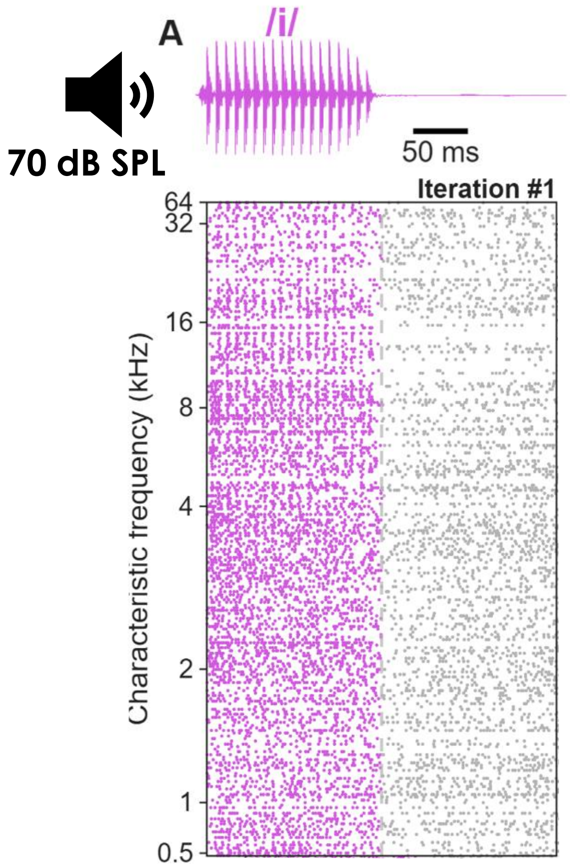
(PhD student)

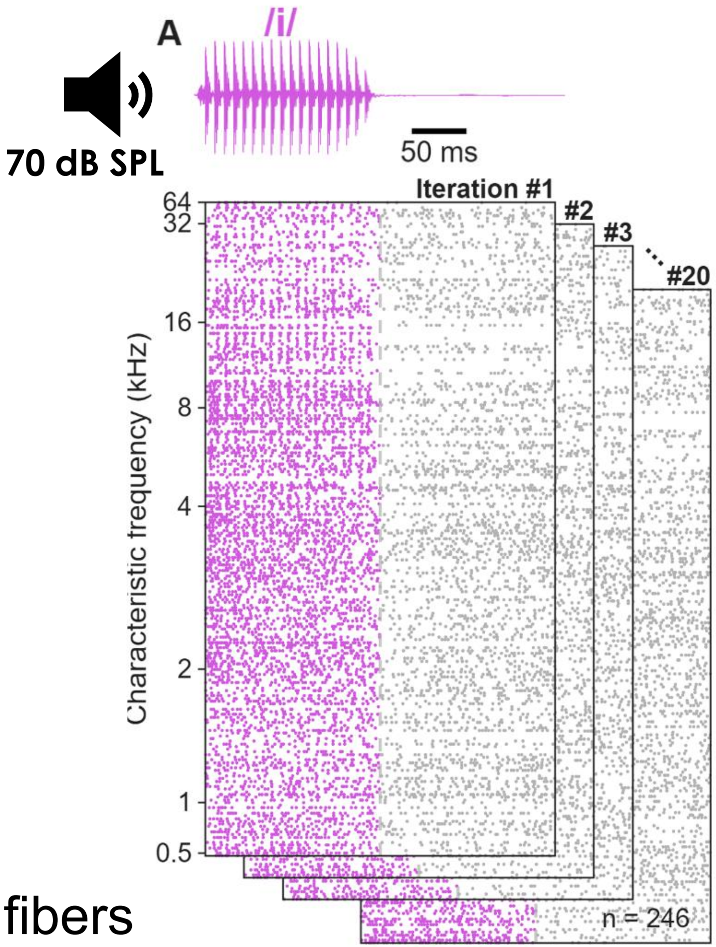
institute for neurosciences
montpellier

Neurogrammes



n = 246 fibers

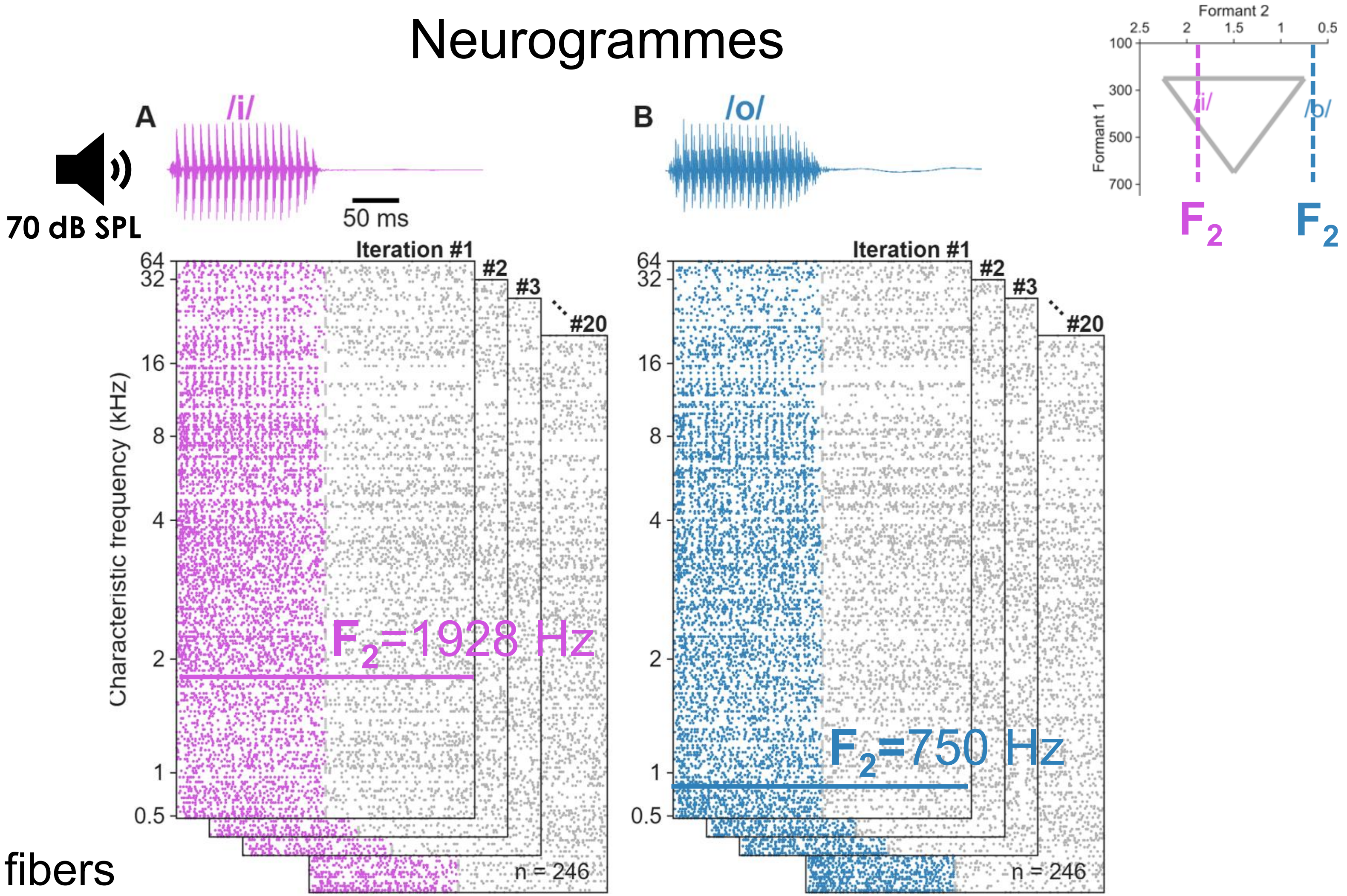
Neurogrammes



20 présentations

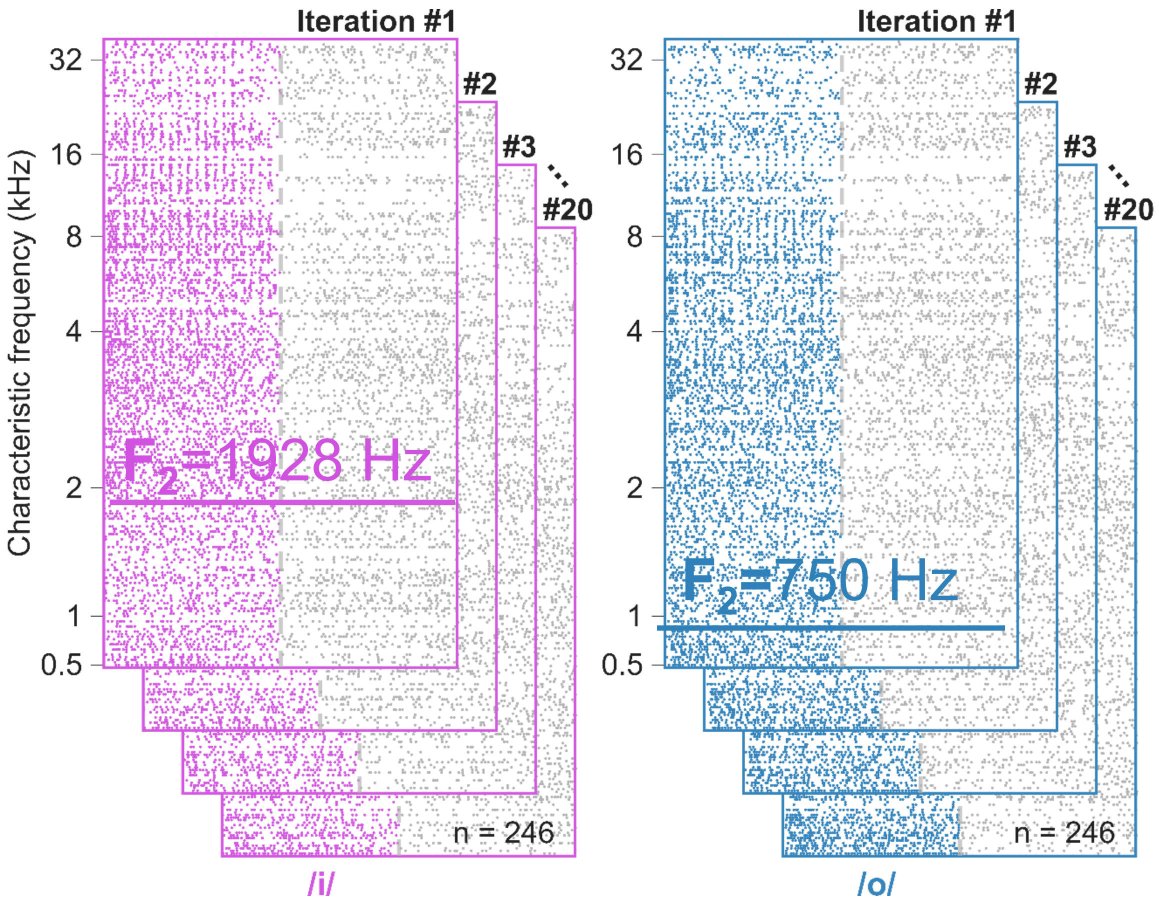
n = 246 fibers

Neurogrammes



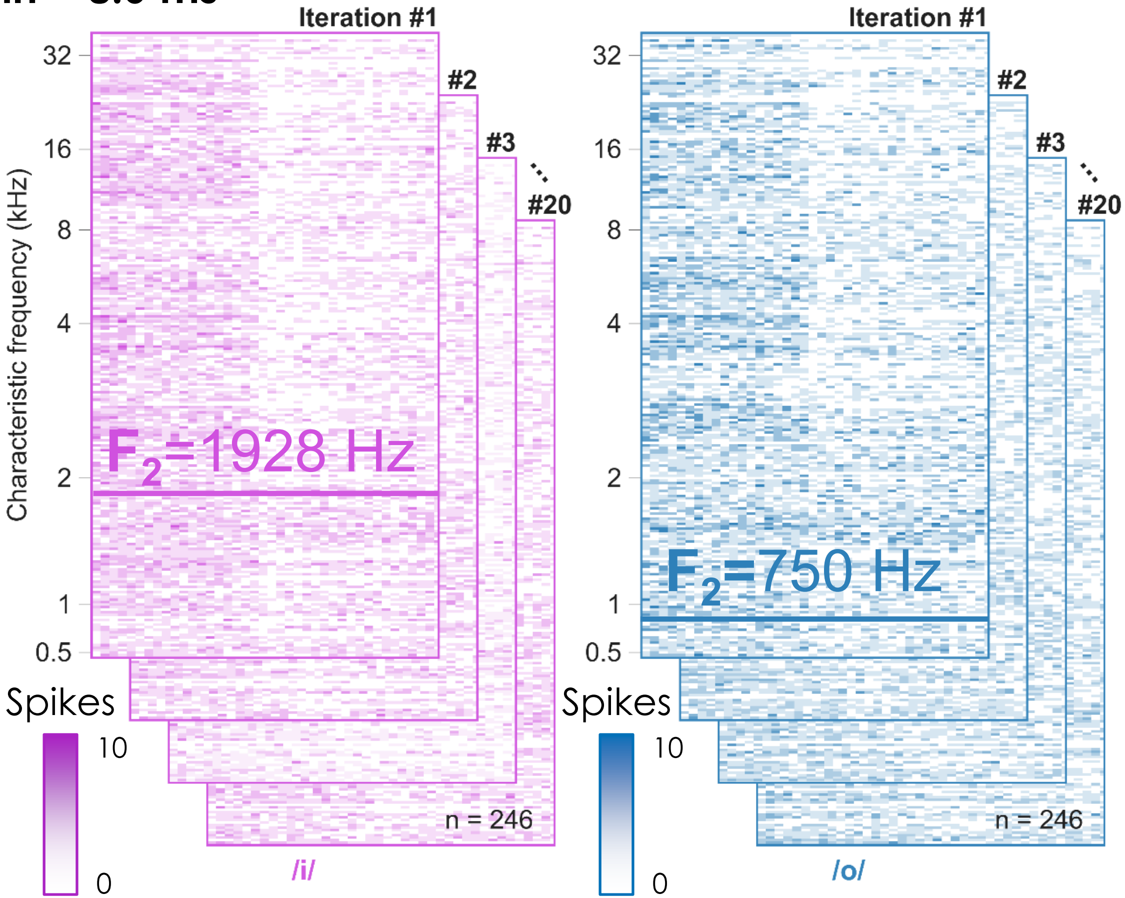
n = 246 fibers

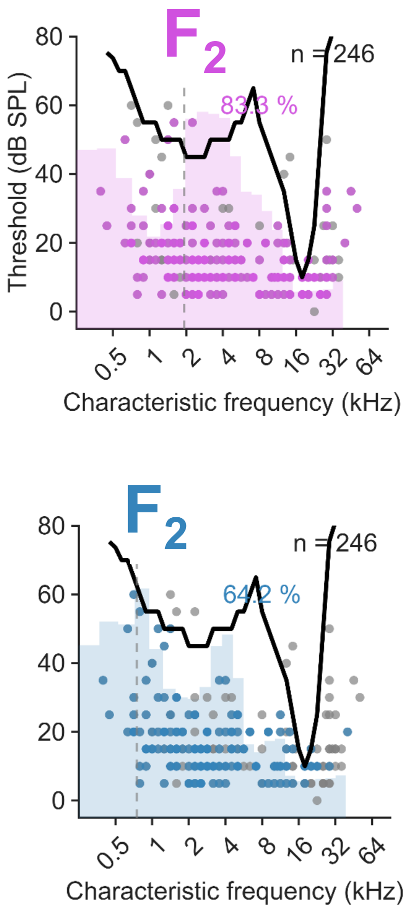
Neurogrammes



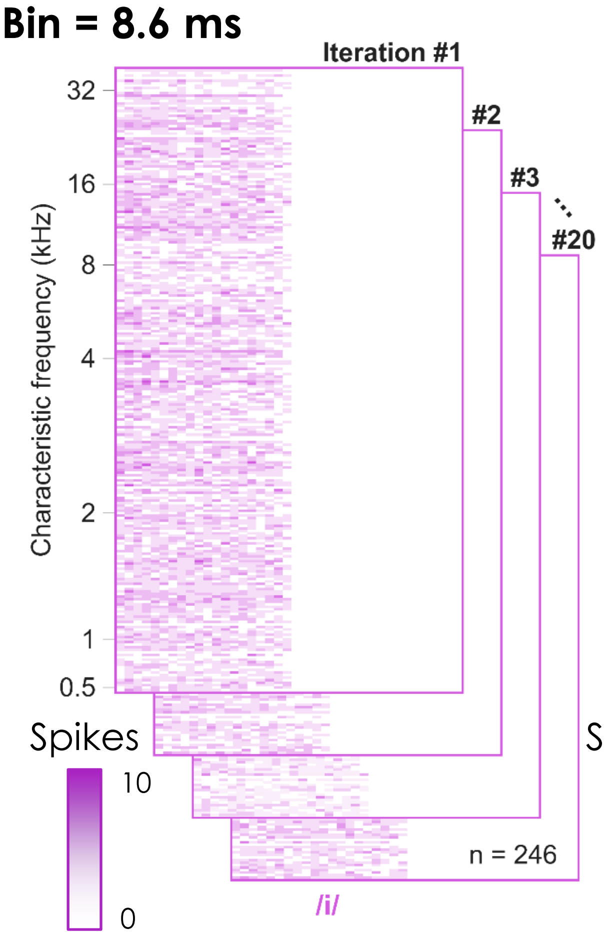
Neurogrammes

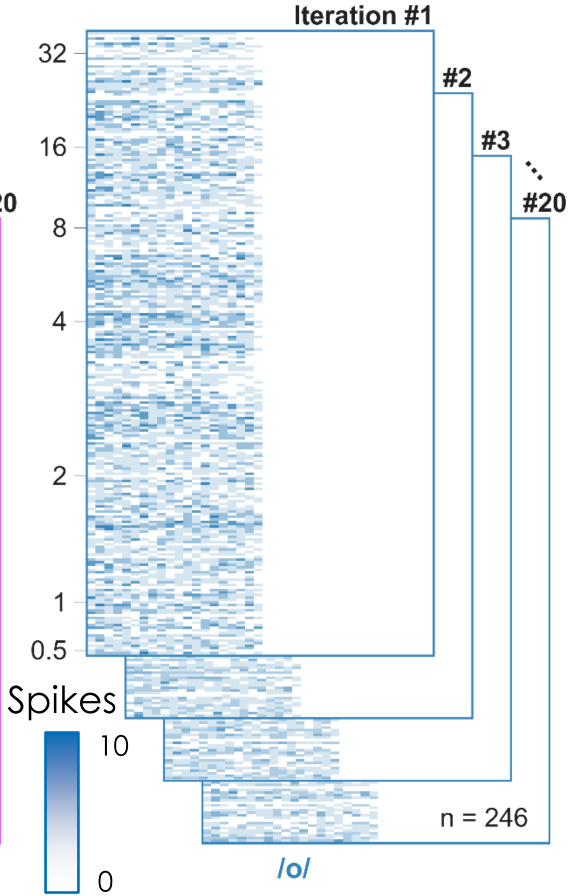
Bin = 8.6 ms



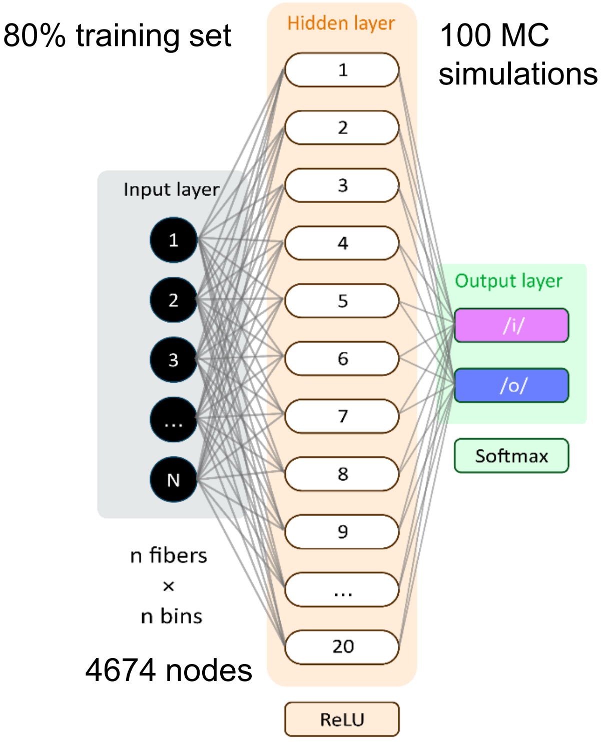


Neurogrammes

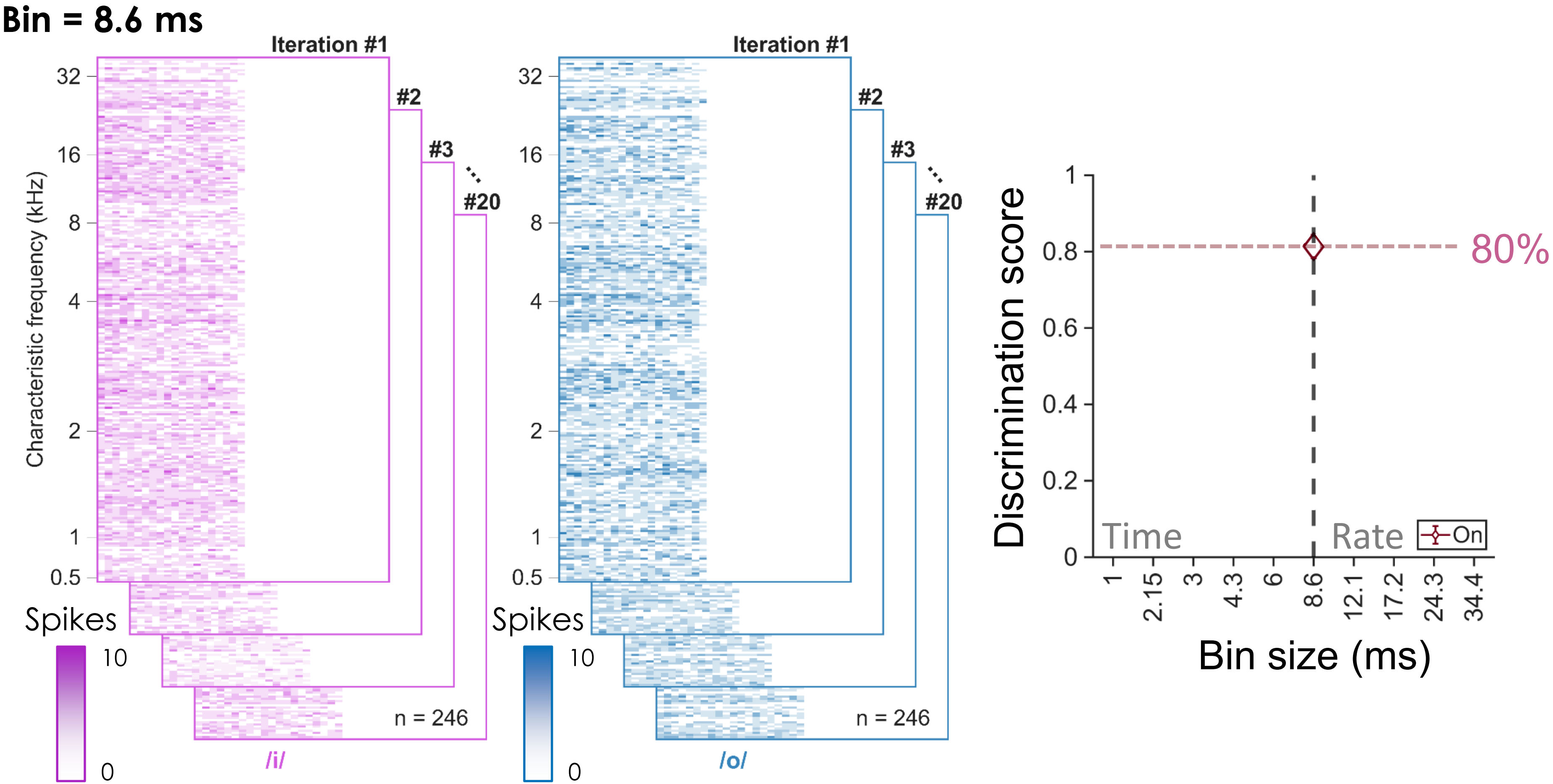




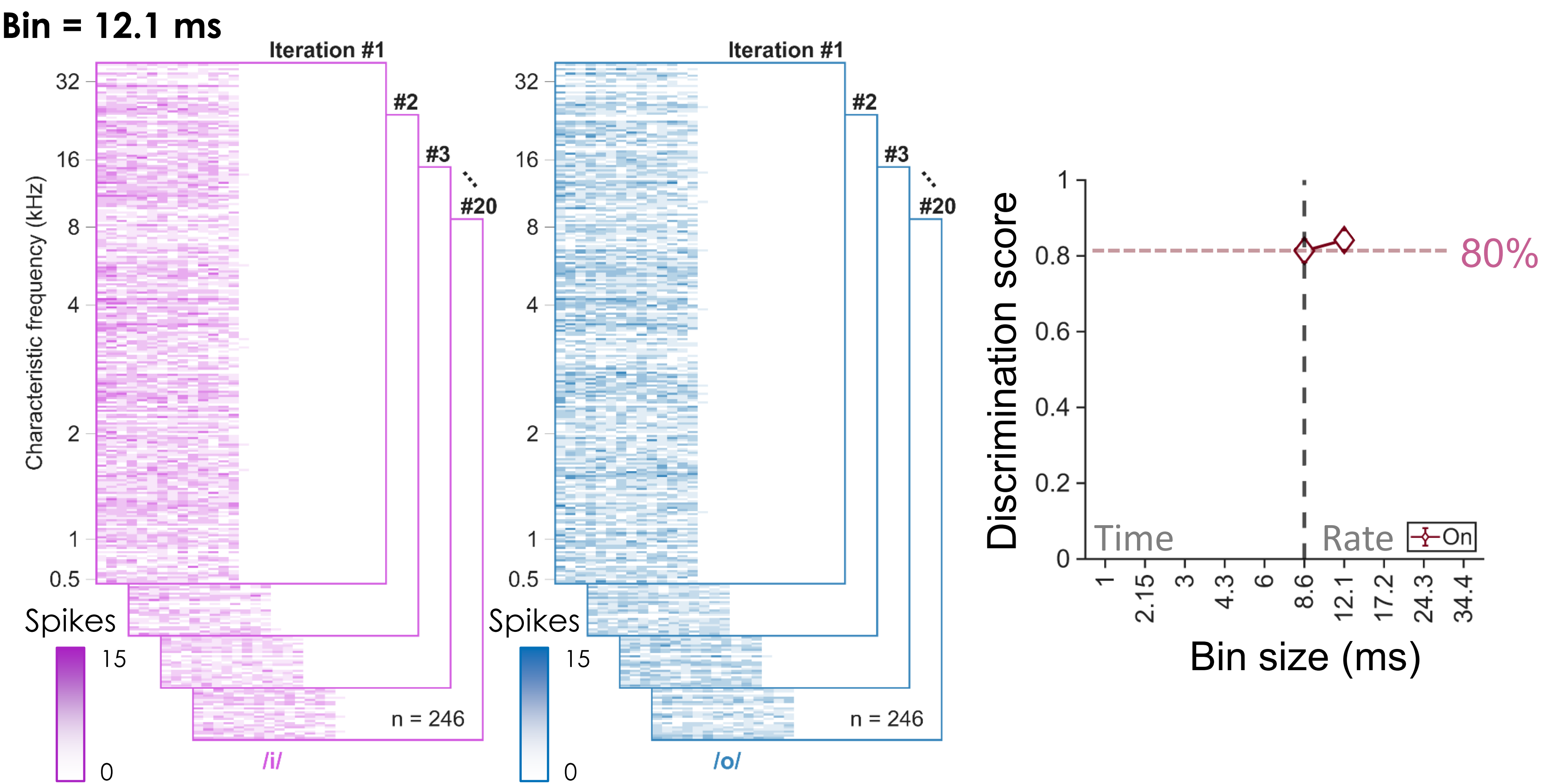
Neural network



Score de discrimination du **Neural Network**

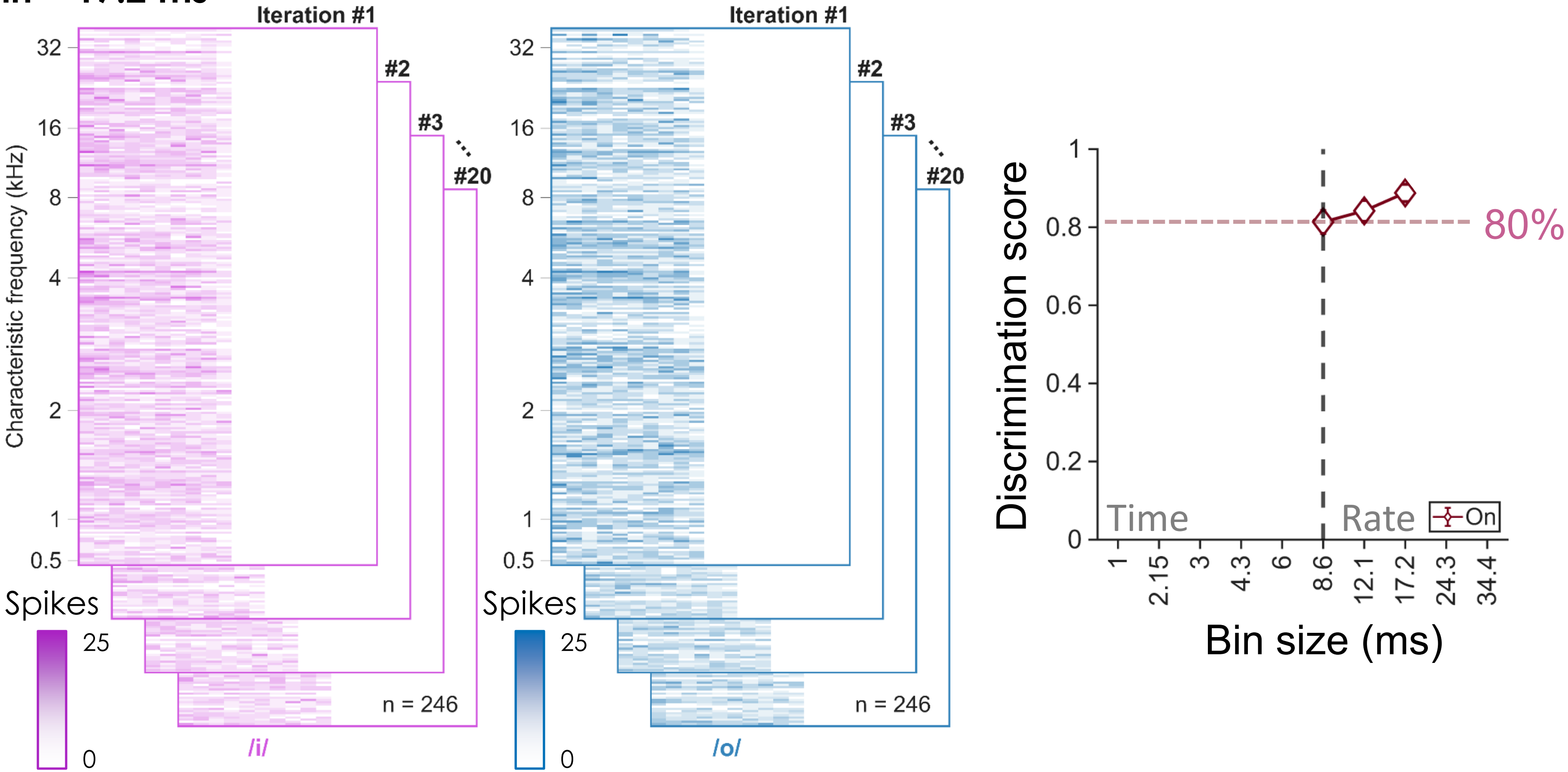


Score de discrimination du **Neural Network**

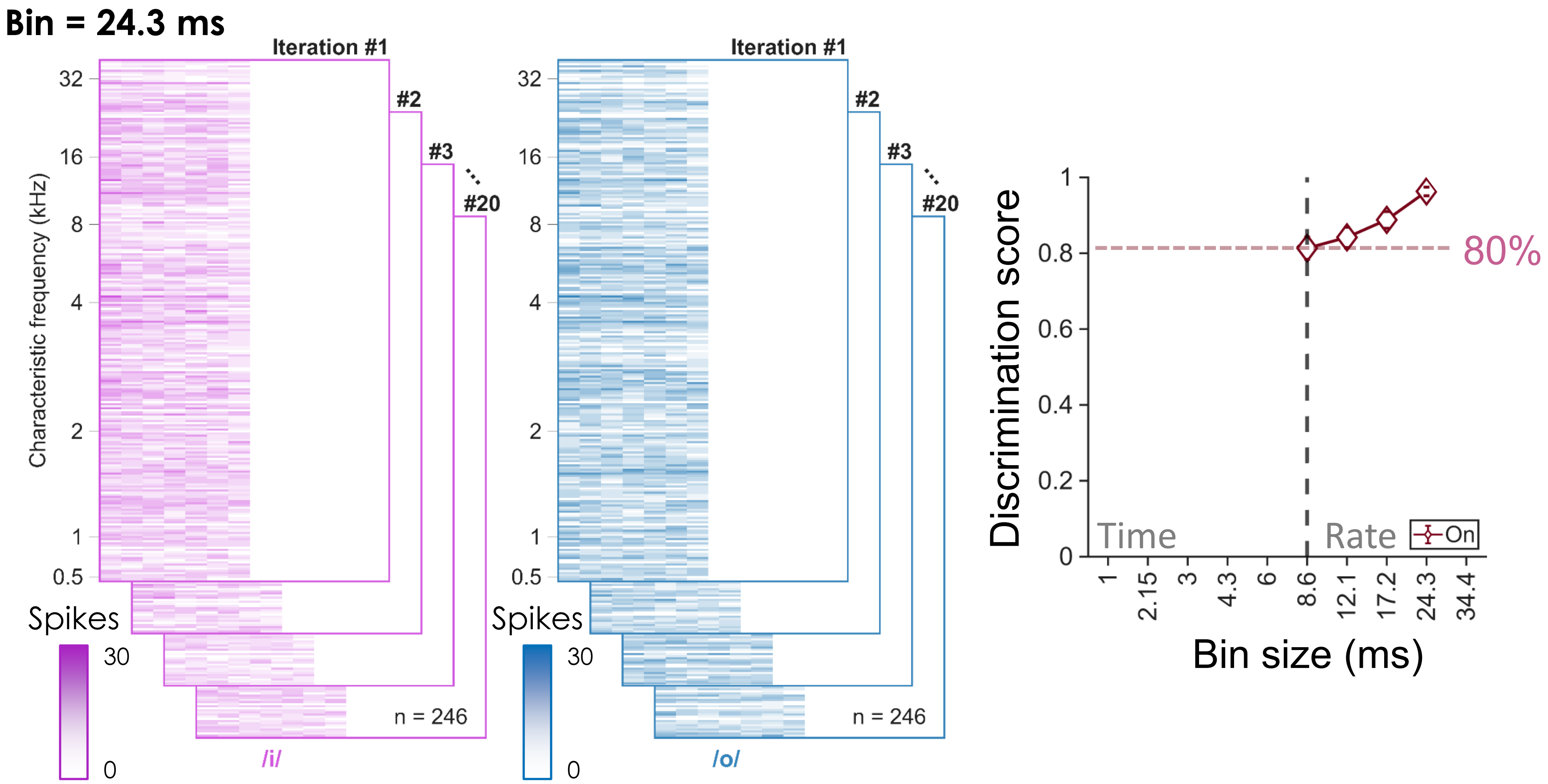


Score de discrimination du **Neural Network**

Bin = 17.2 ms

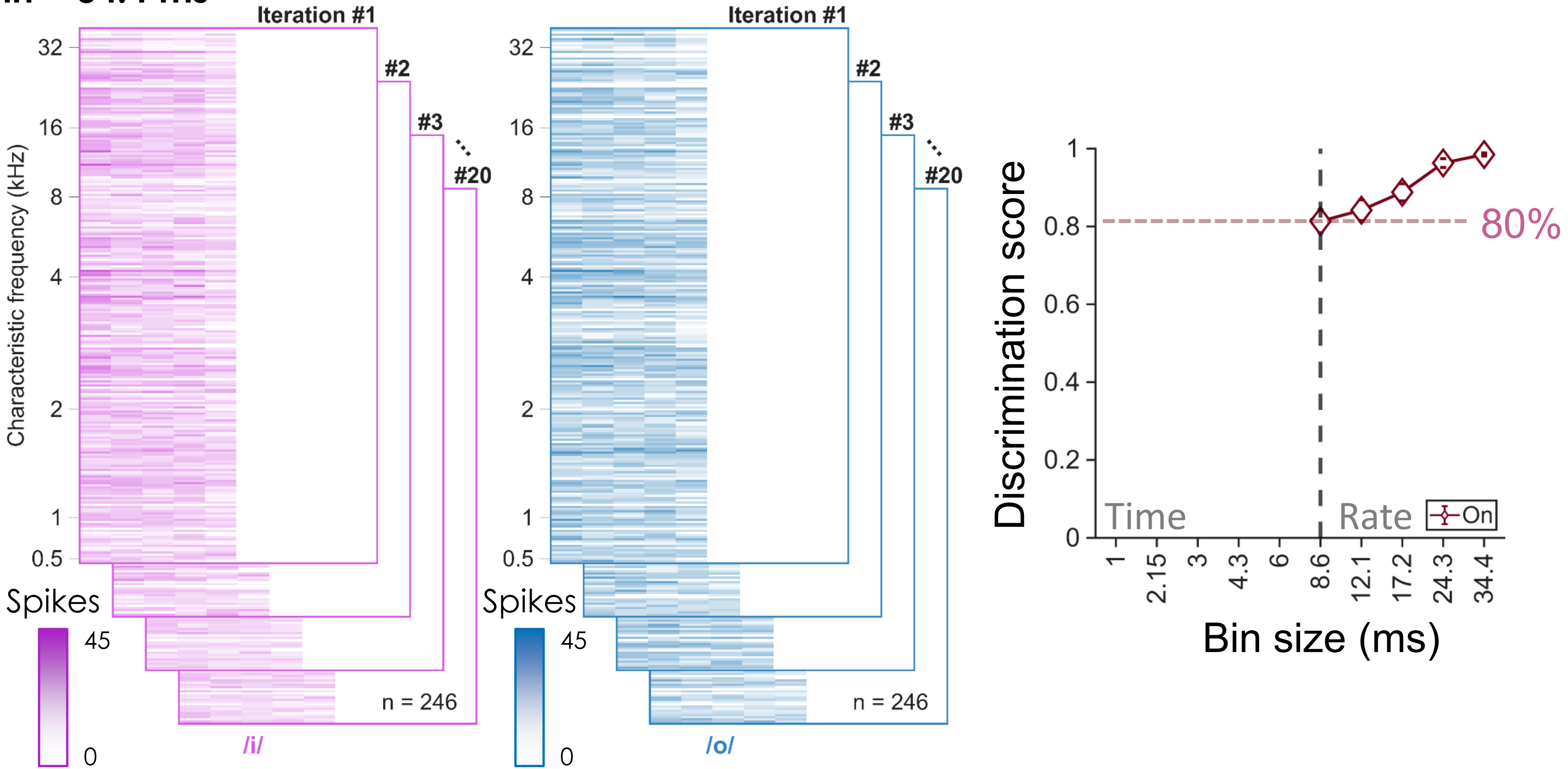


Score de discrimination du **Neural Network**

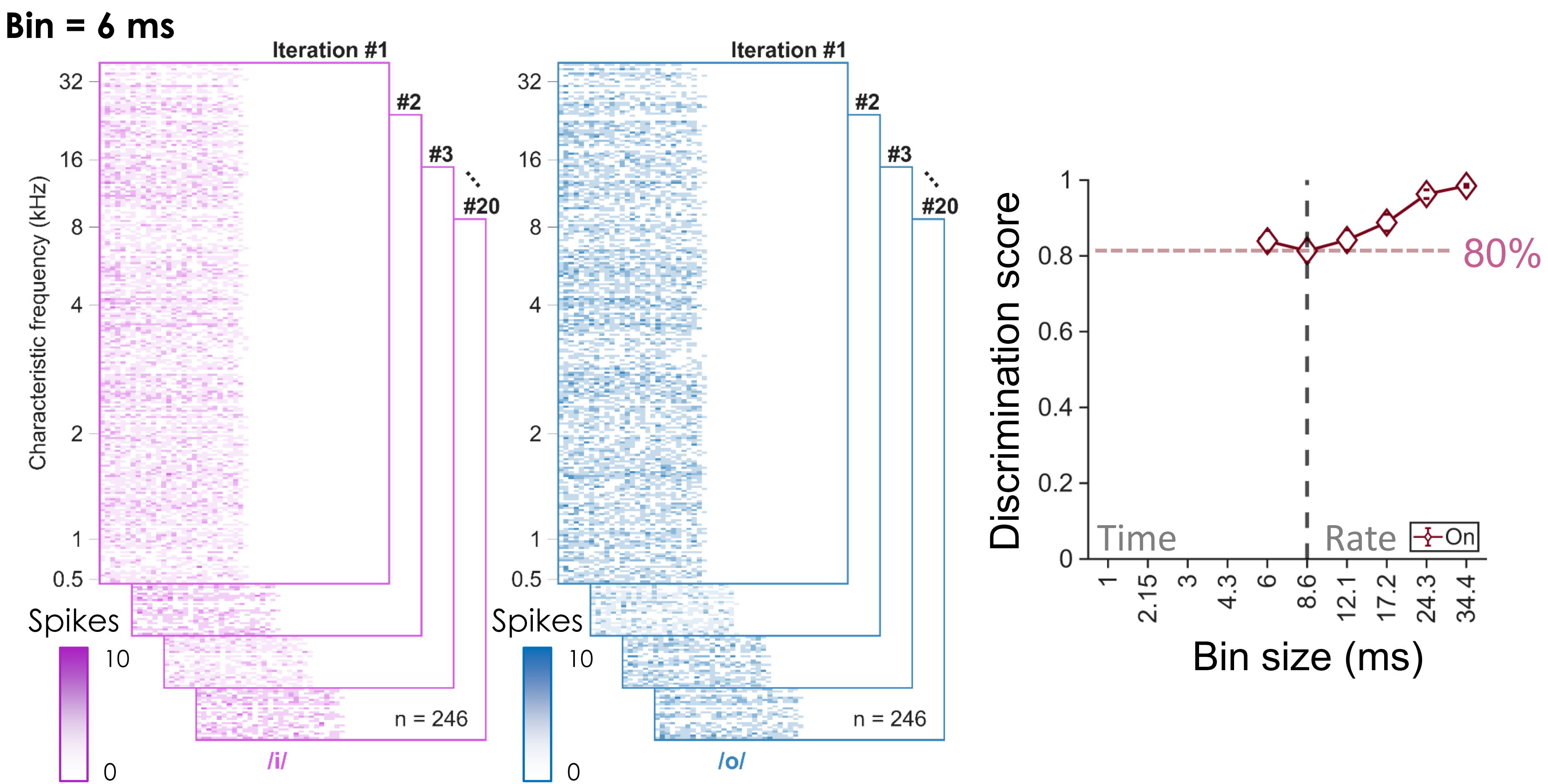


Score de discrimination du **Neural Network**

Bin = 34.4 ms

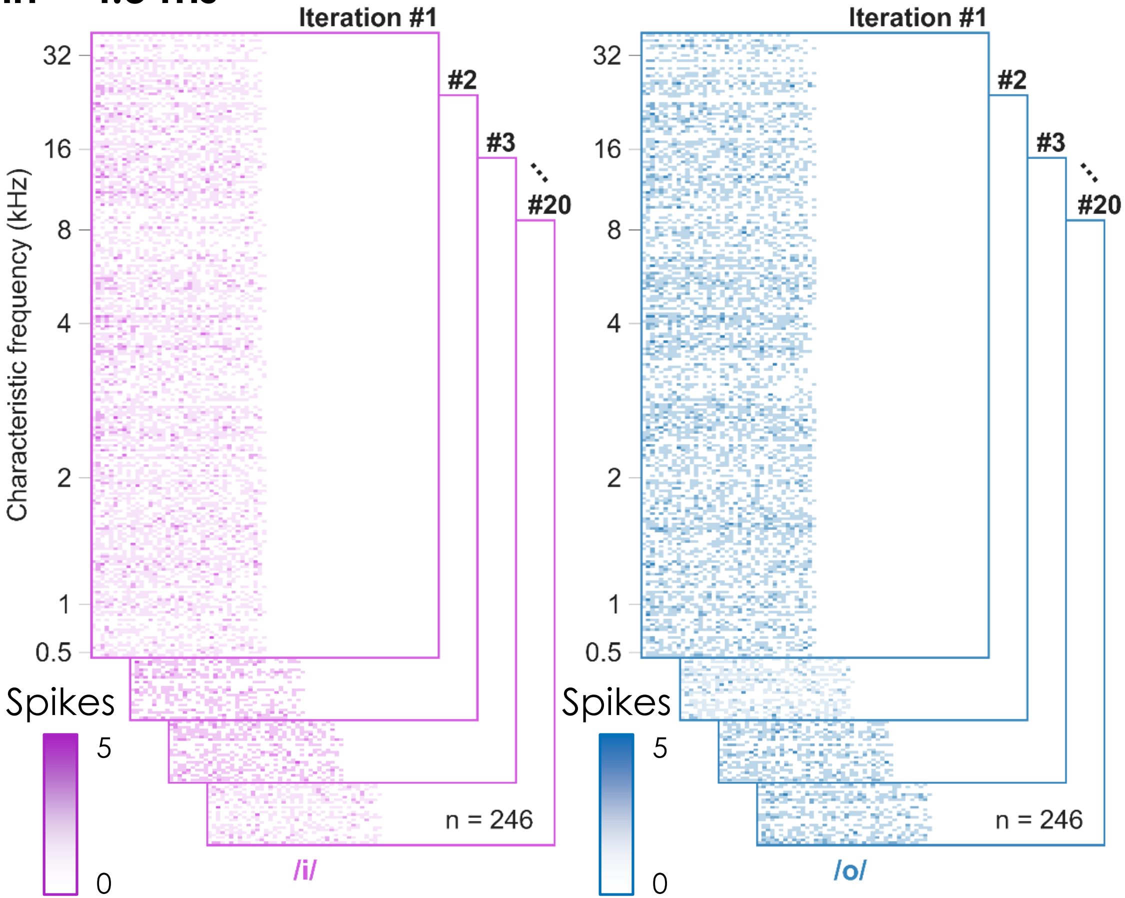


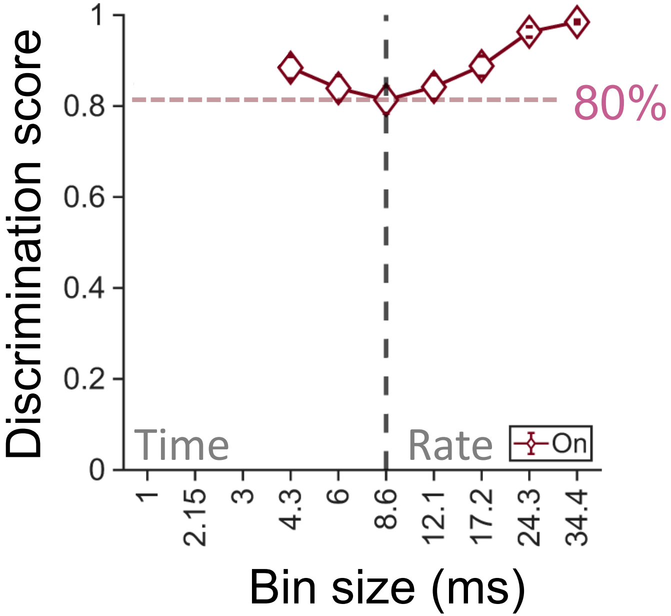
Score de discrimination du **Neural Network**



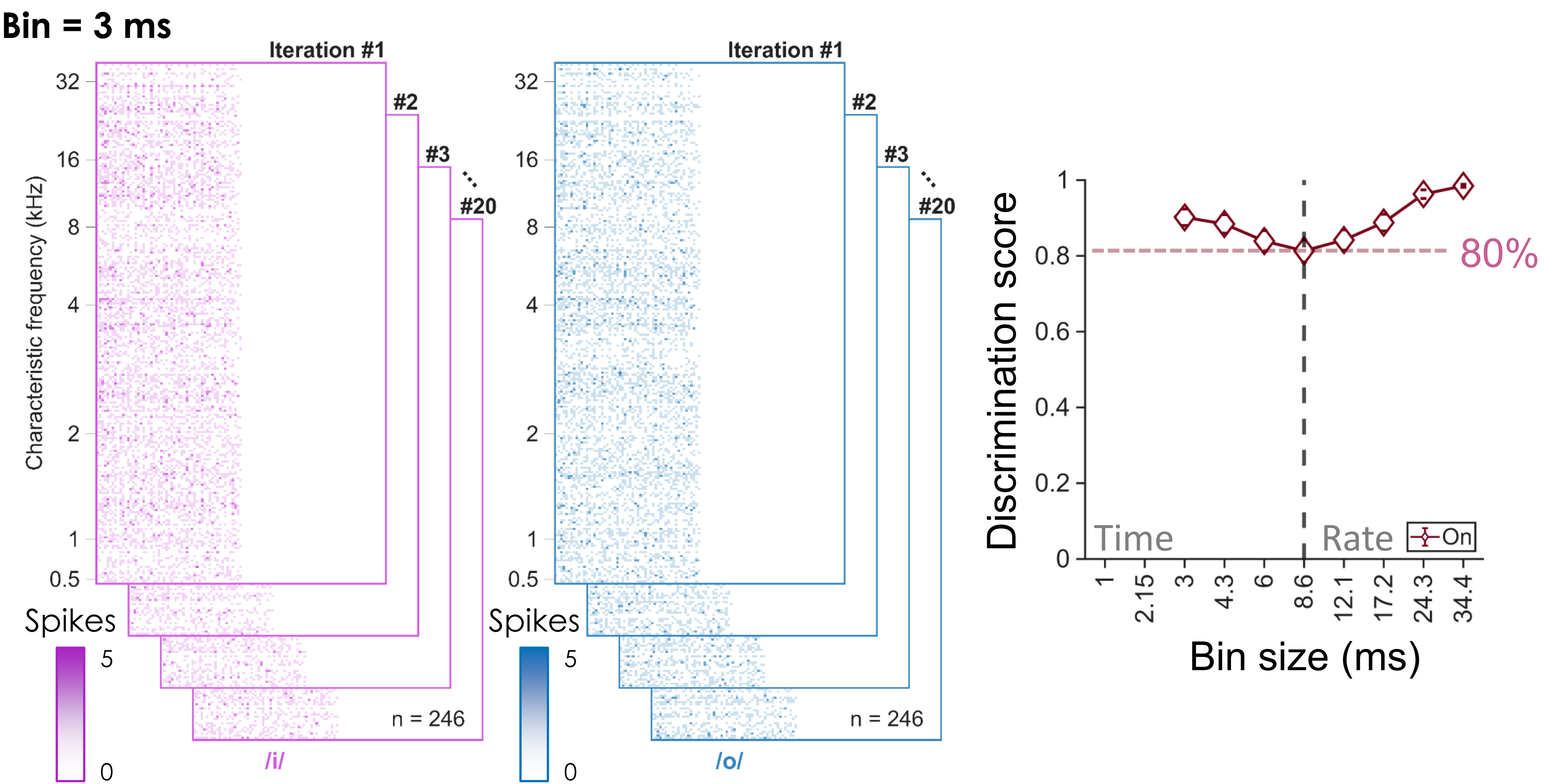
Score de discrimination du **Neural Network**

Bin = 4.3 ms

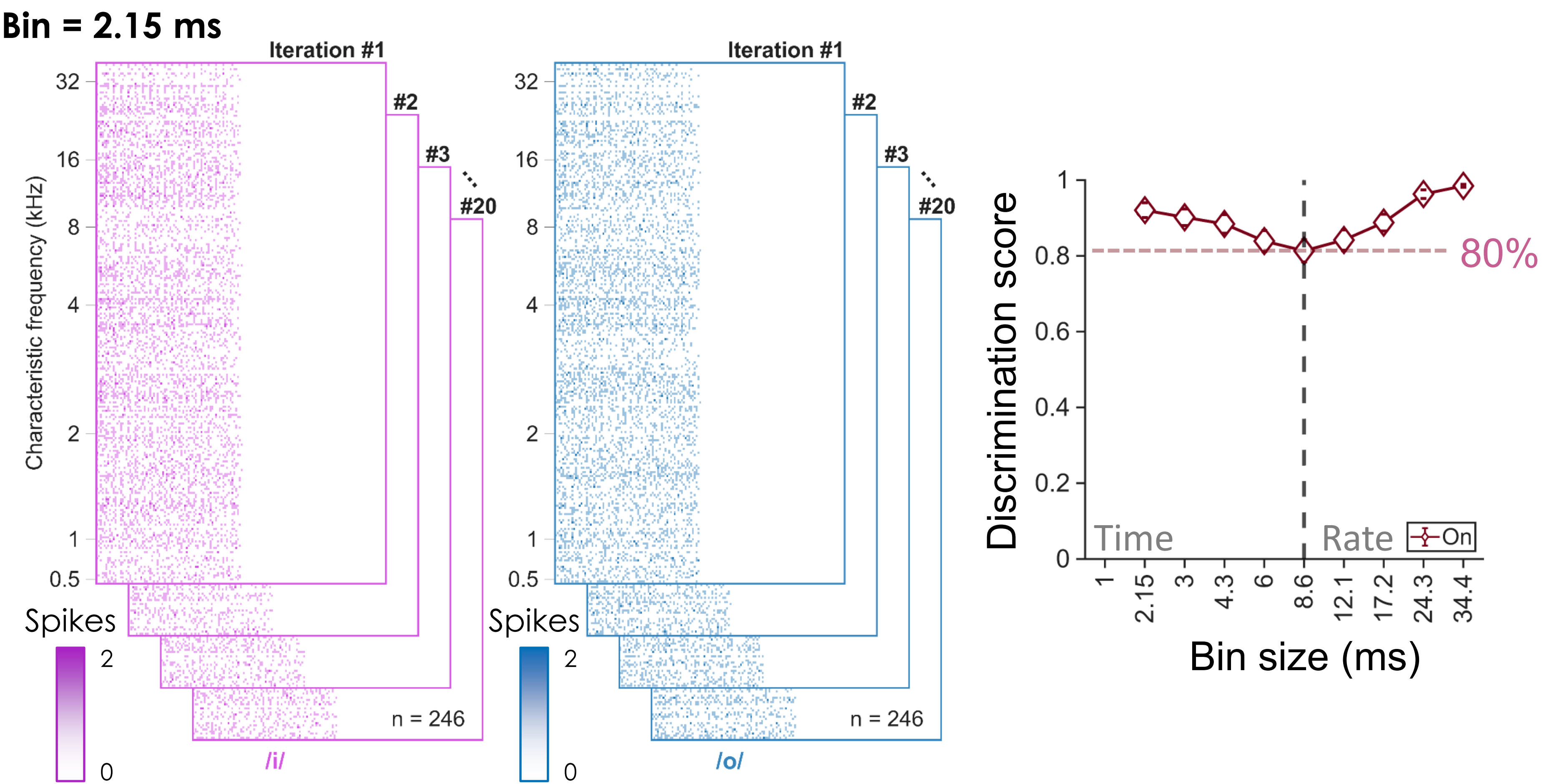




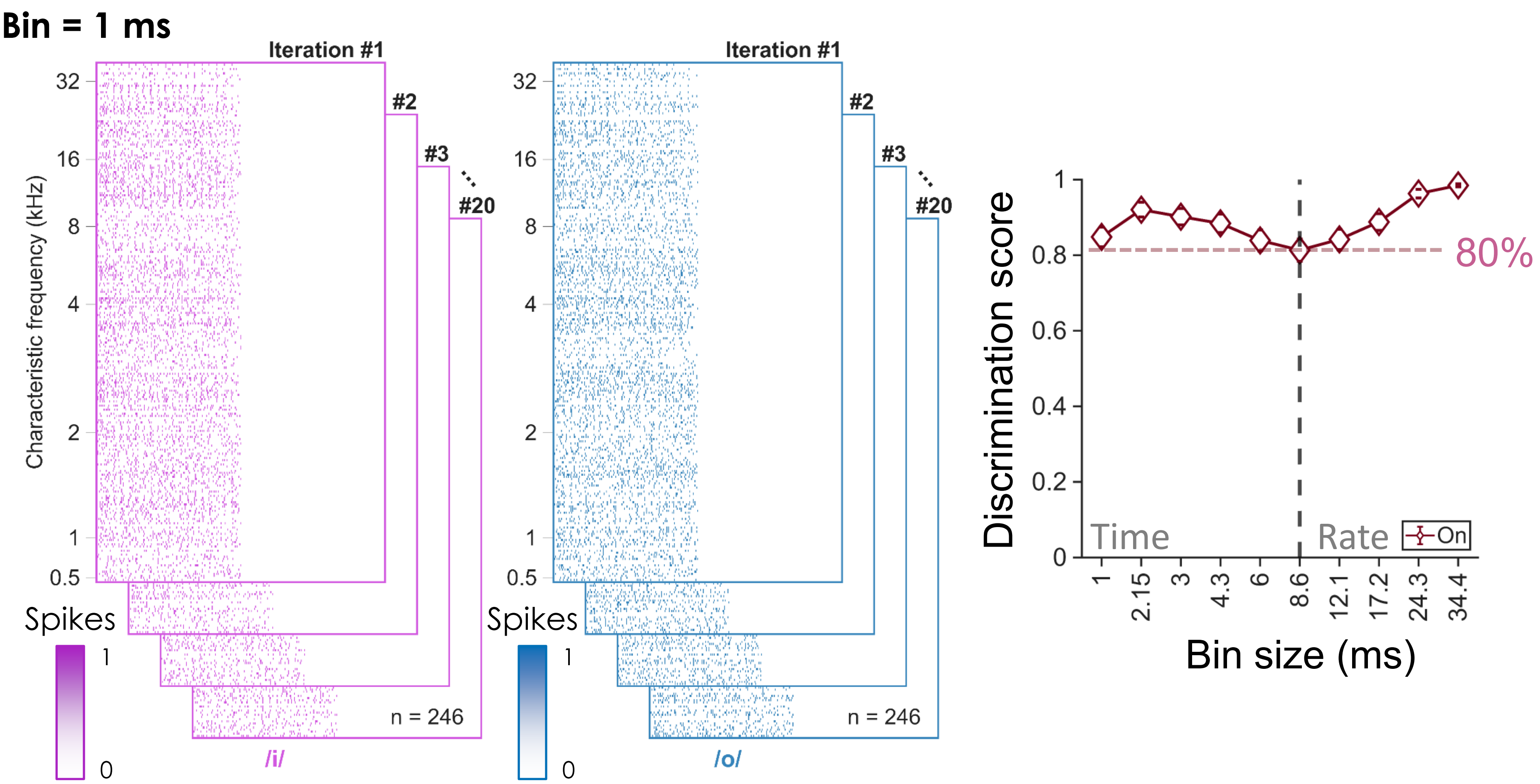
Score de discrimination du **Neural Network**



Score de discrimination du **Neural Network**

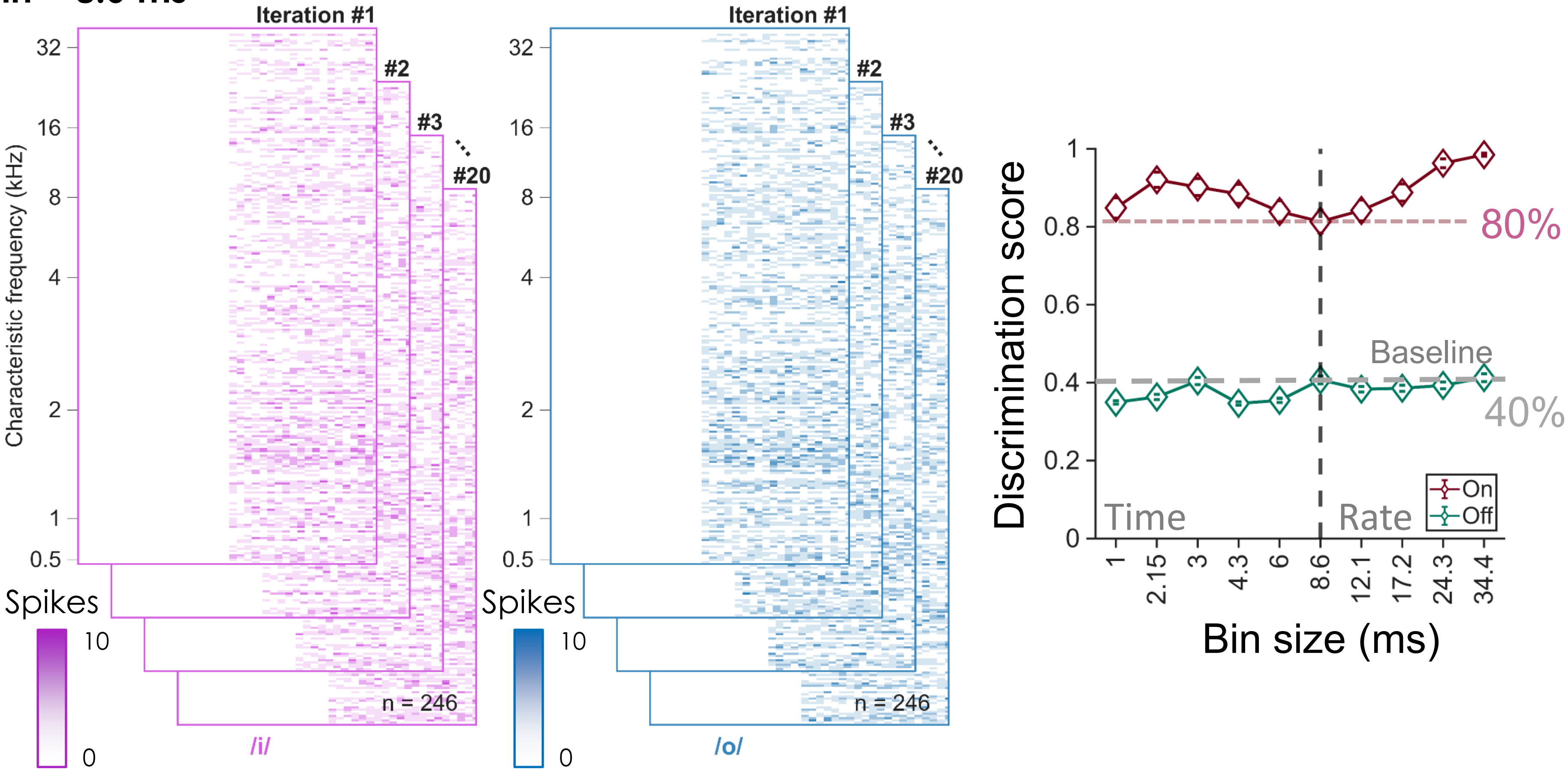


Score de discrimination du **Neural Network**

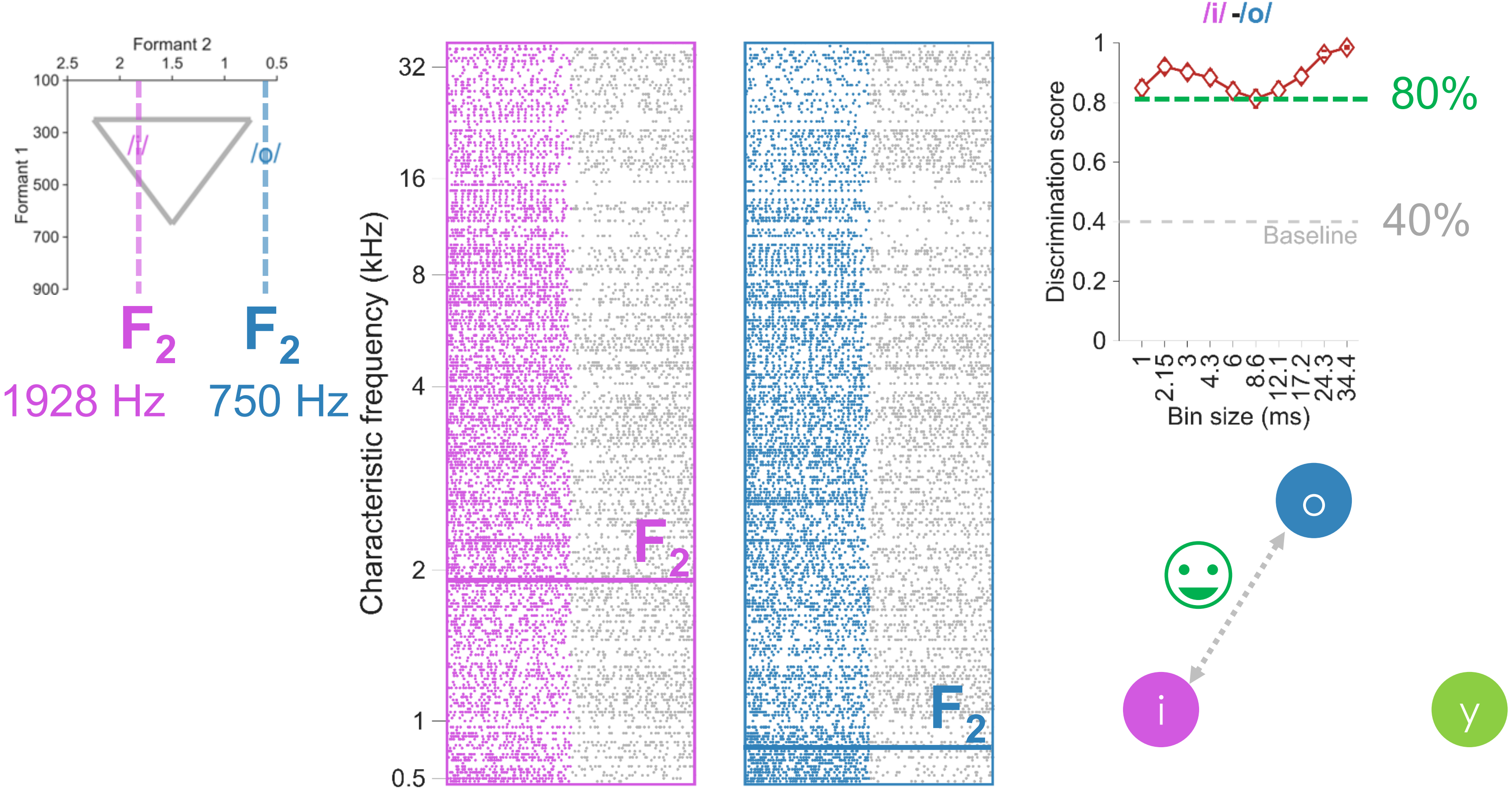


Score de discrimination du **Neural Network**

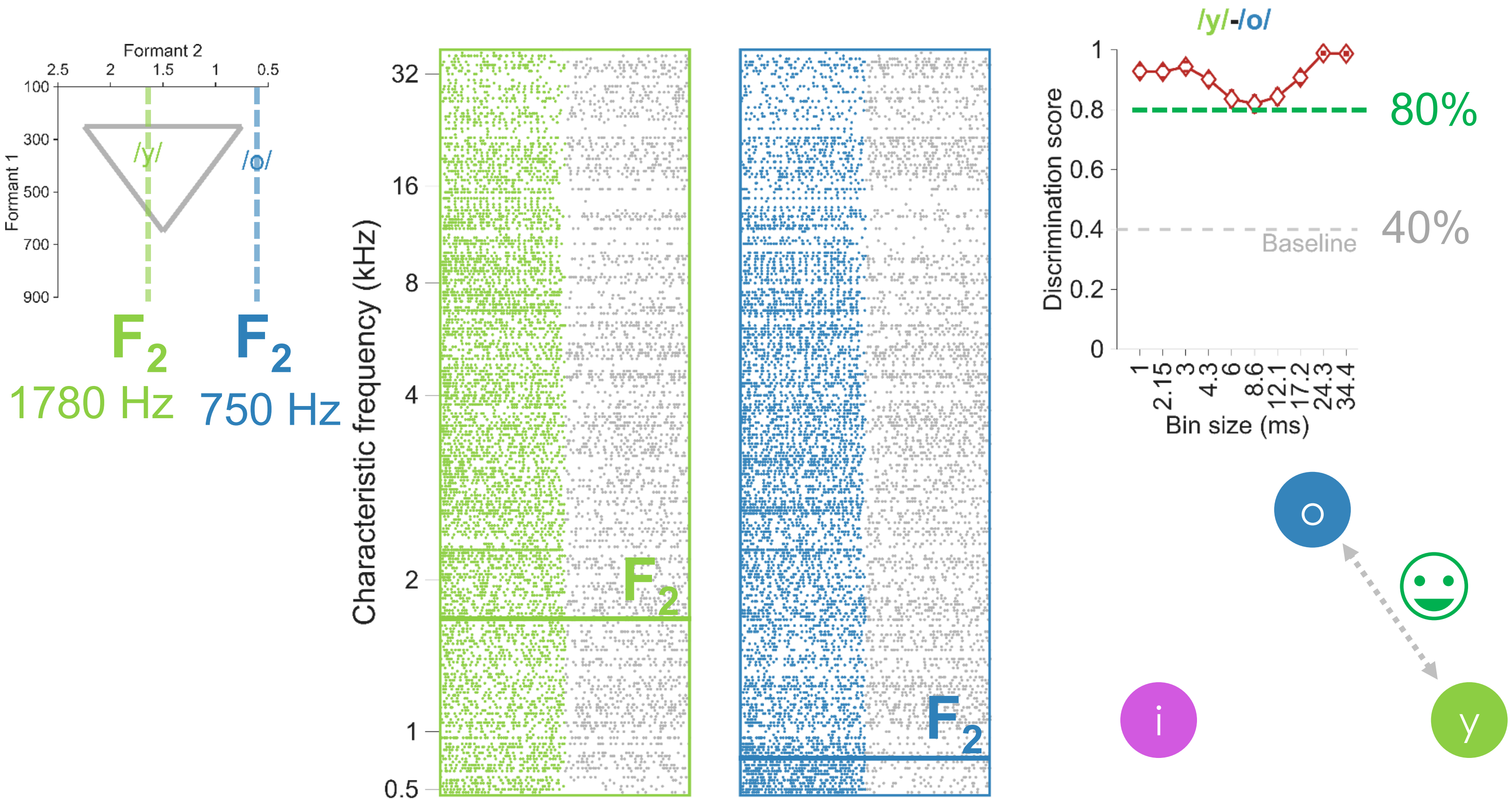
Bin = 8.6 ms



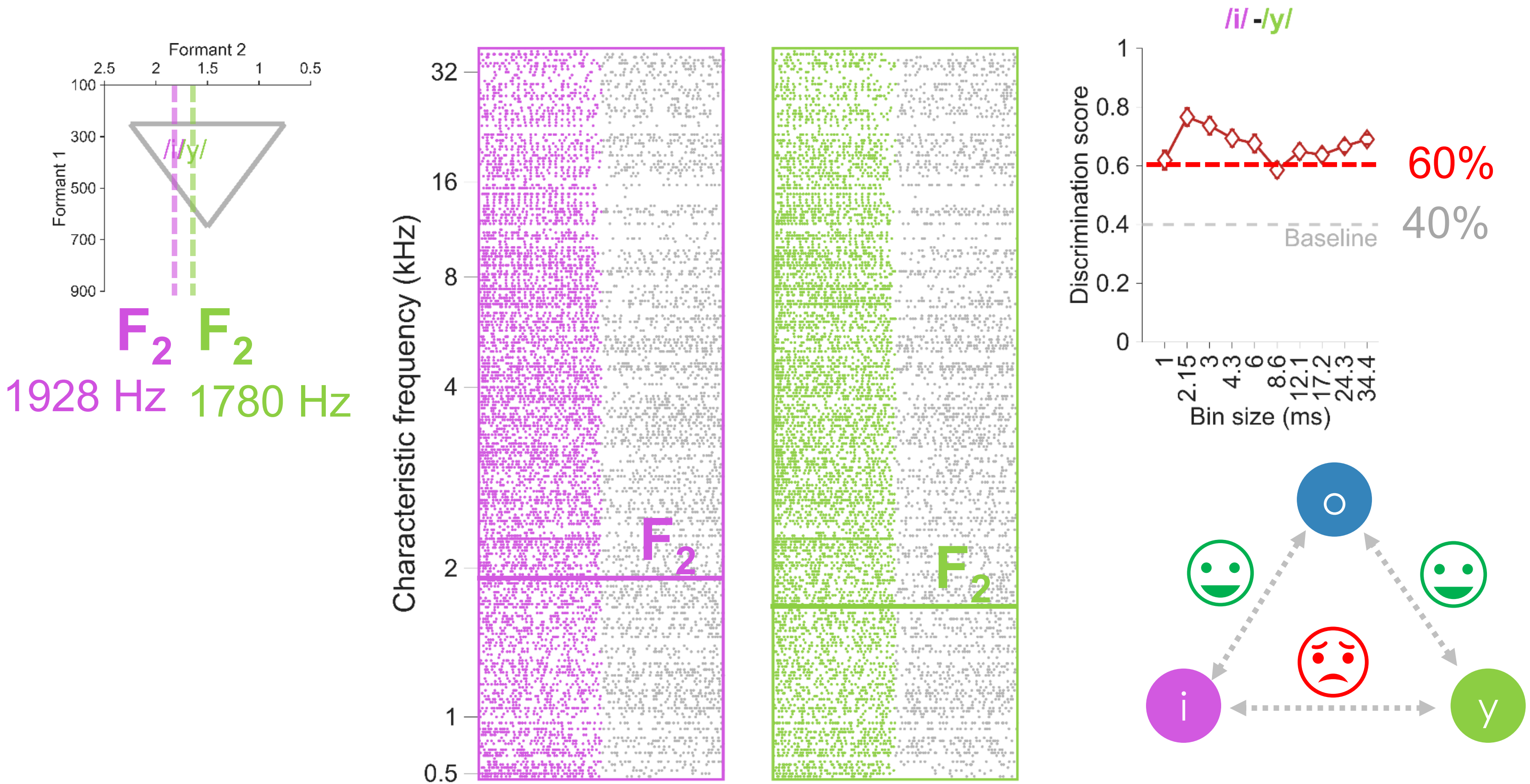
Discrimination de la paire /i/ - /o/



Discrimination de la paire /y/ - /o/



Discrimination de la paire /i/ - /y/

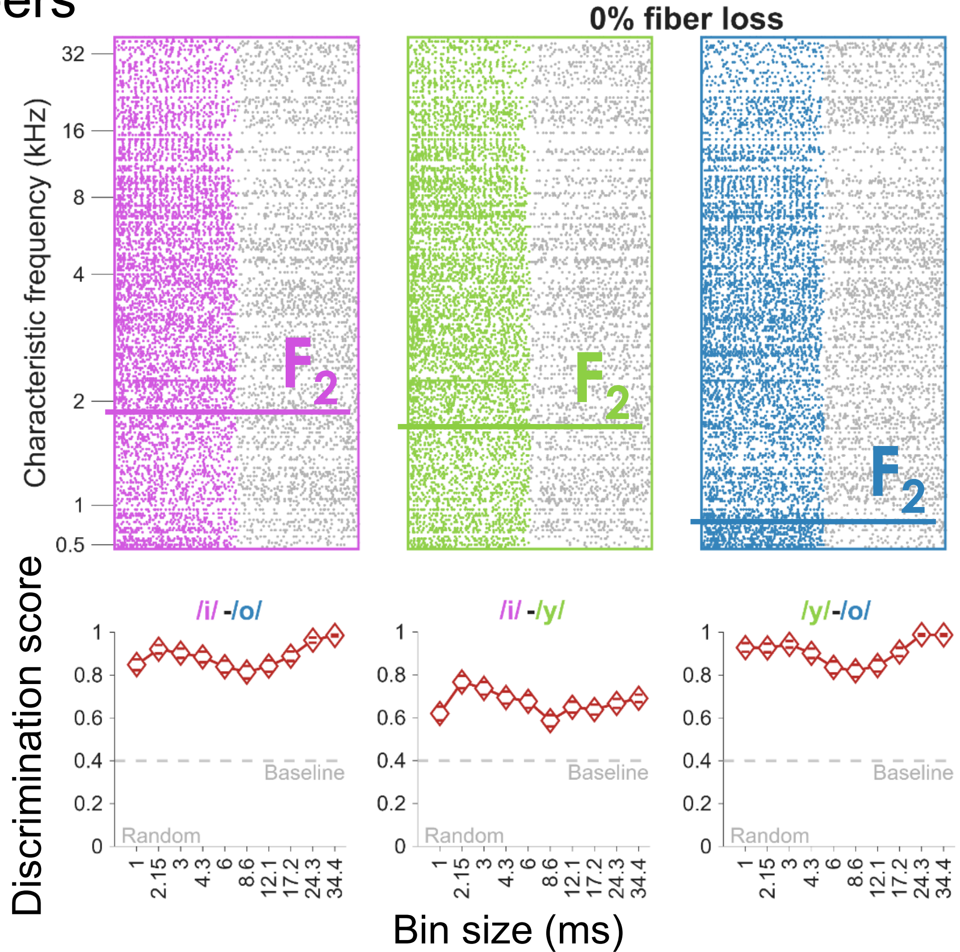


Hypothèse validée !

Impact d’une perte de fibres sur le score de discrimination ?

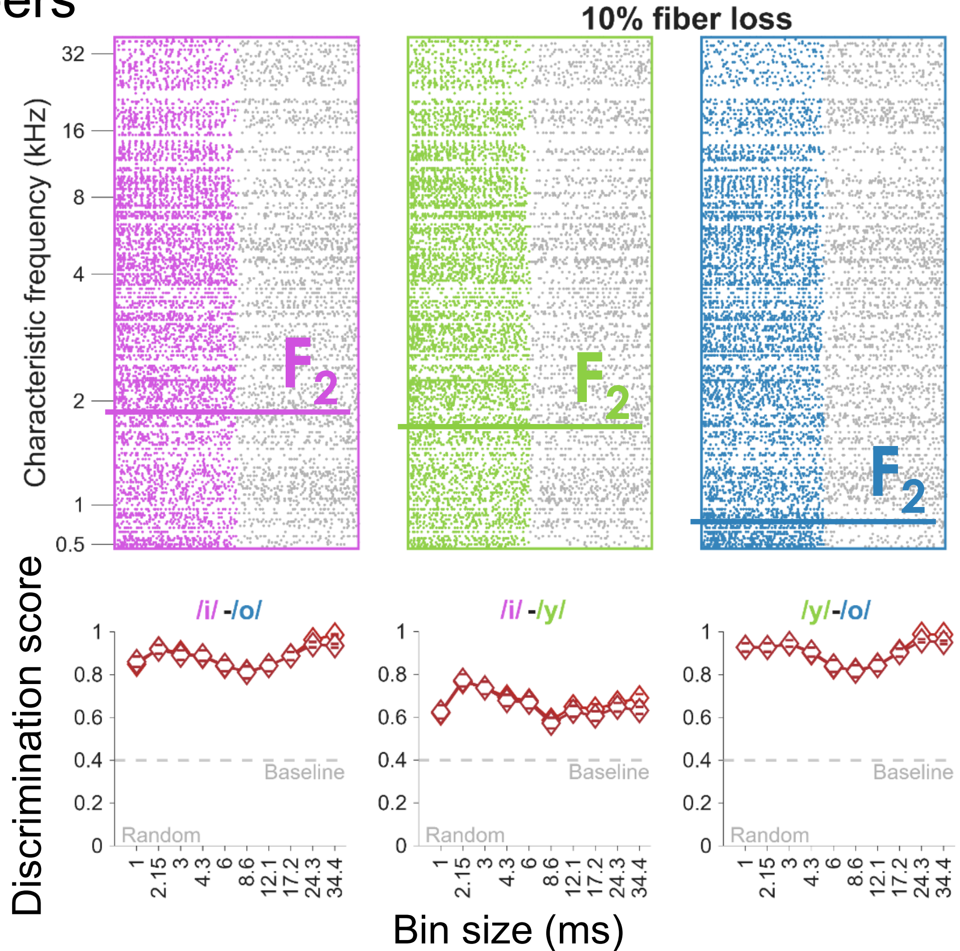
Scenario 1 : perte de fibres « **aléatoire** »

n = 246 fibers



Scenario 1 : perte de fibres « **aléatoire** »

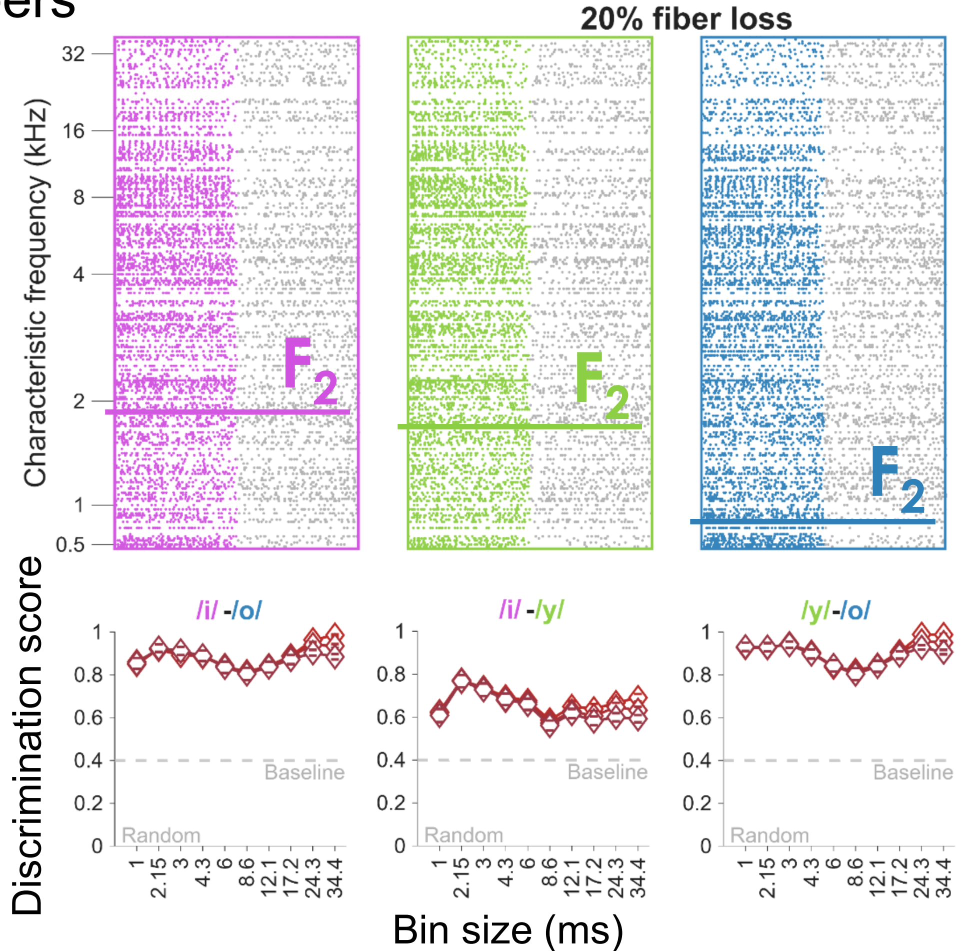
n = 221 fibers



10 % de perte

Scenario 1 : perte de fibres « **aléatoire** »

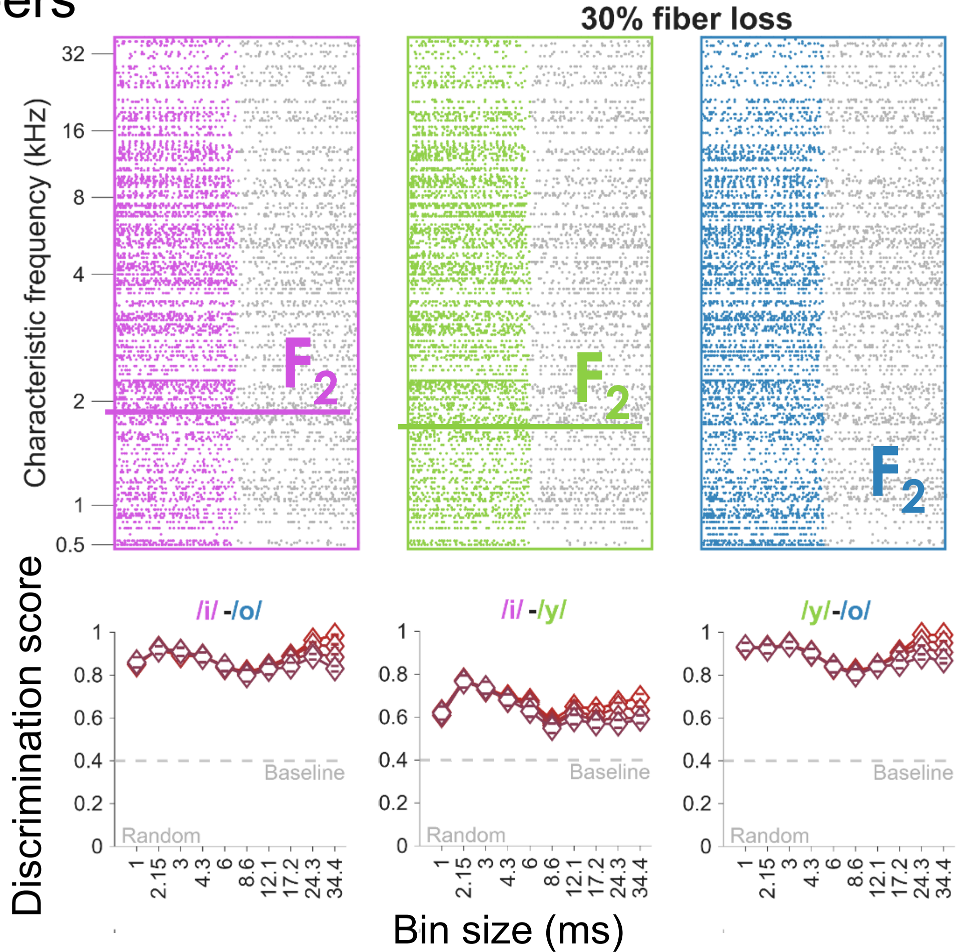
n = 197 fibers



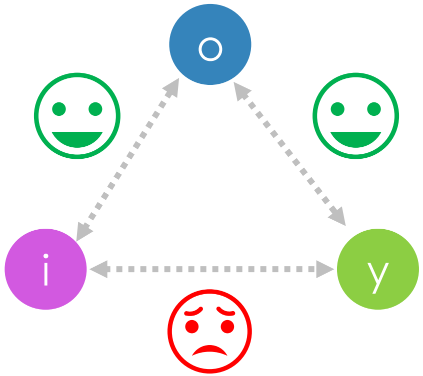
20 % de perte

Scenario 1 : perte de fibres « aléatoire »

n = 172 fibers

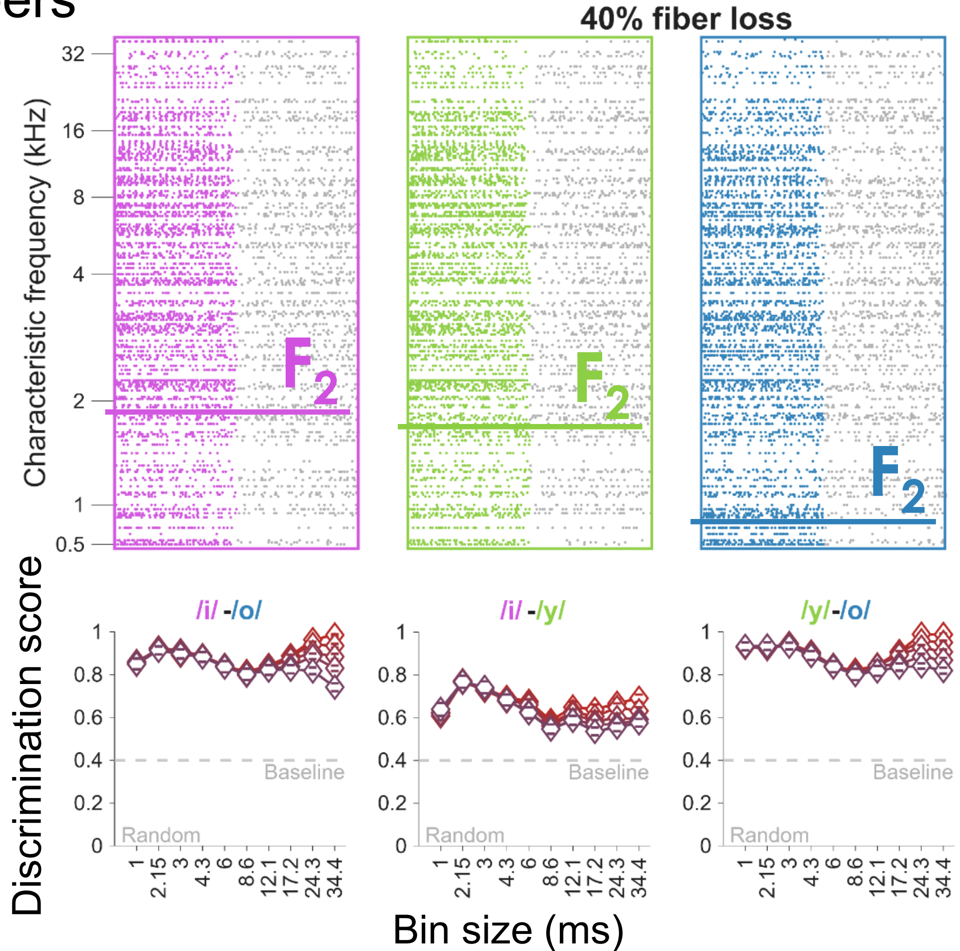


30 % de perte

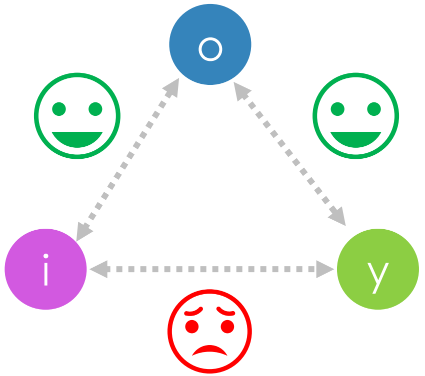


Scenario 1 : perte de fibres « **aléatoire** »

n = 148 fibers

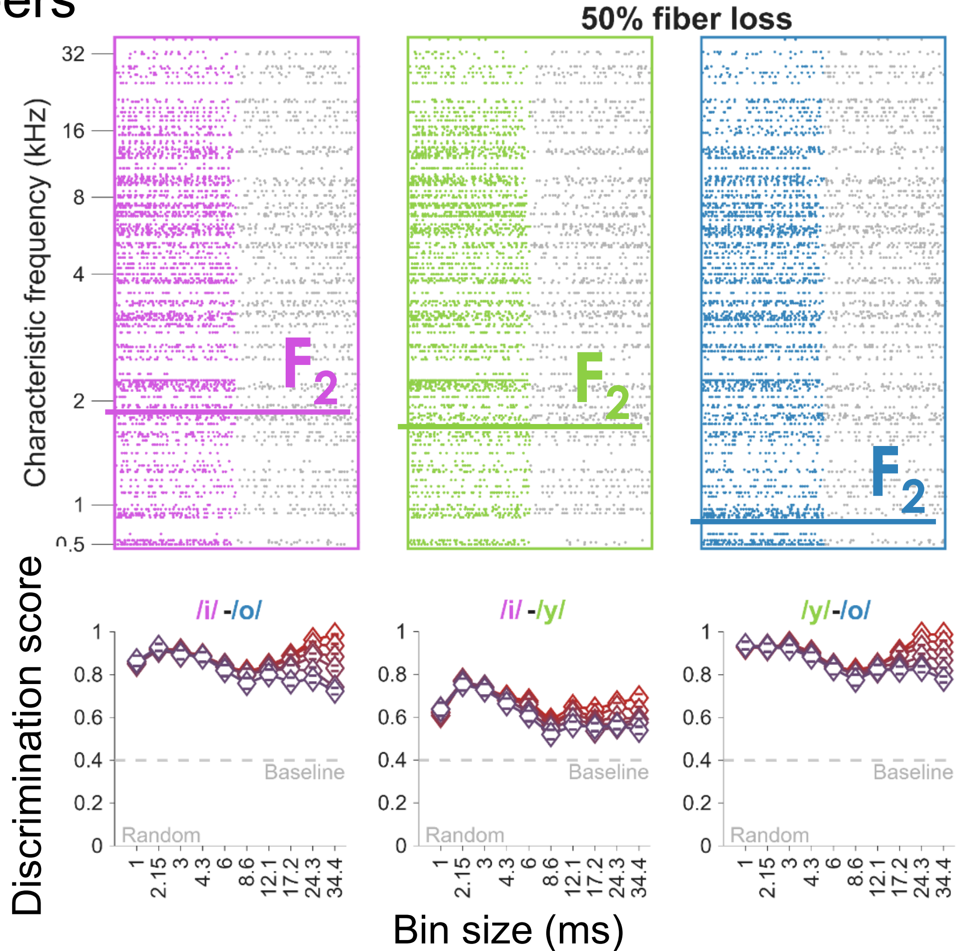


40 % de perte

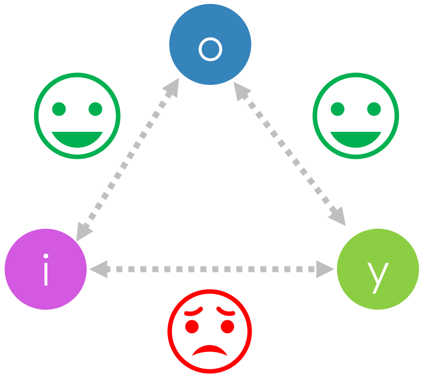


Scenario 1 : perte de fibres « **aléatoire** »

n = 123 fibers

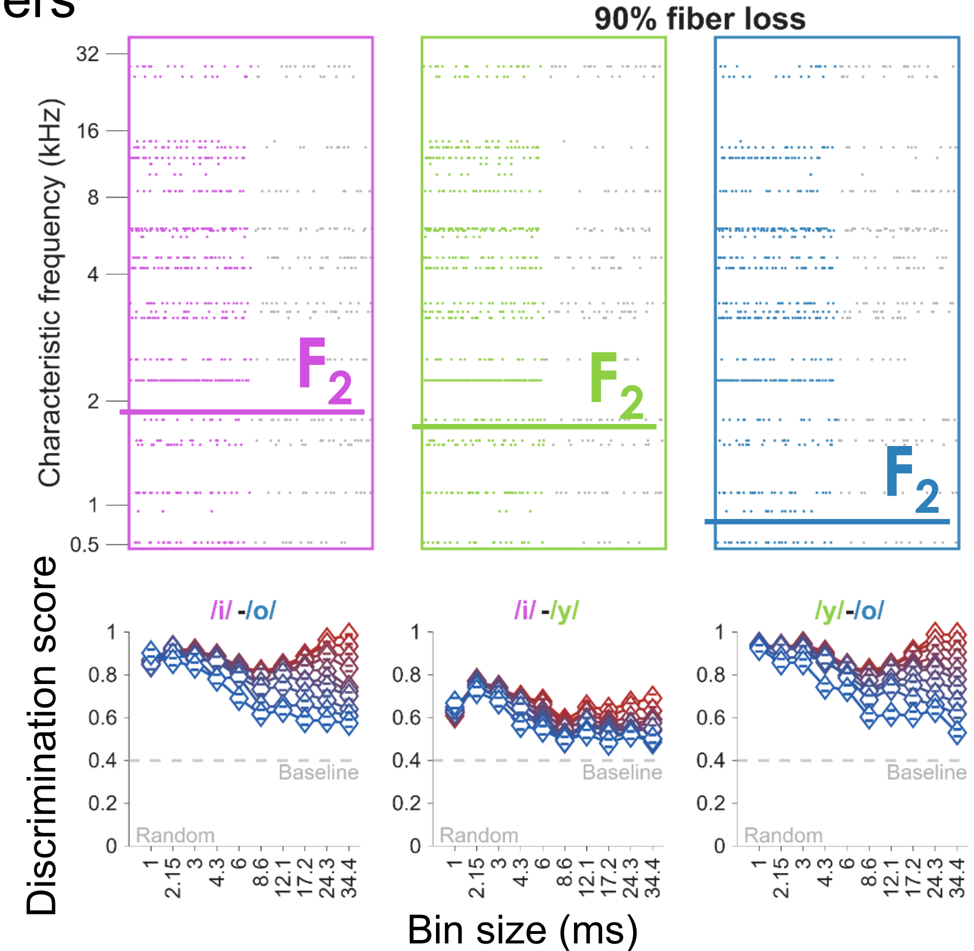


50 % de perte

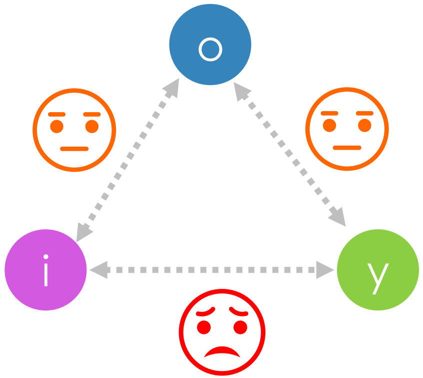


Scenario 1 : perte de fibres « **aléatoire** »

n = 25 fibers

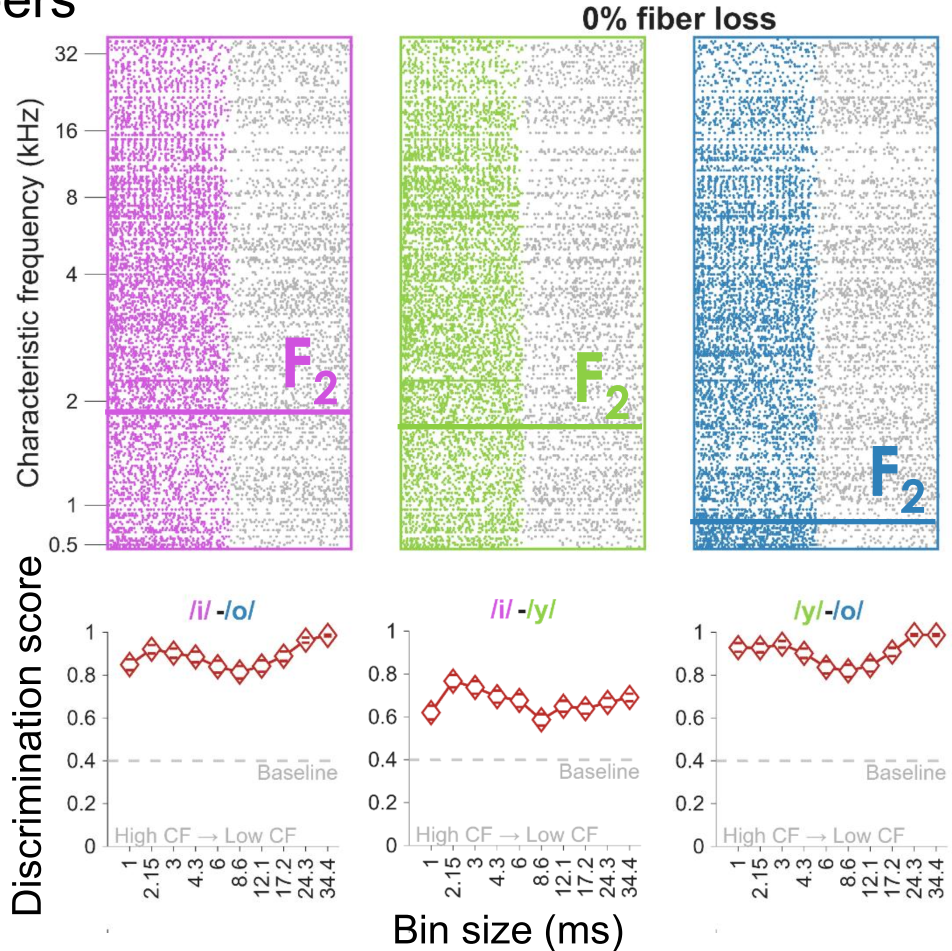


90 % de perte



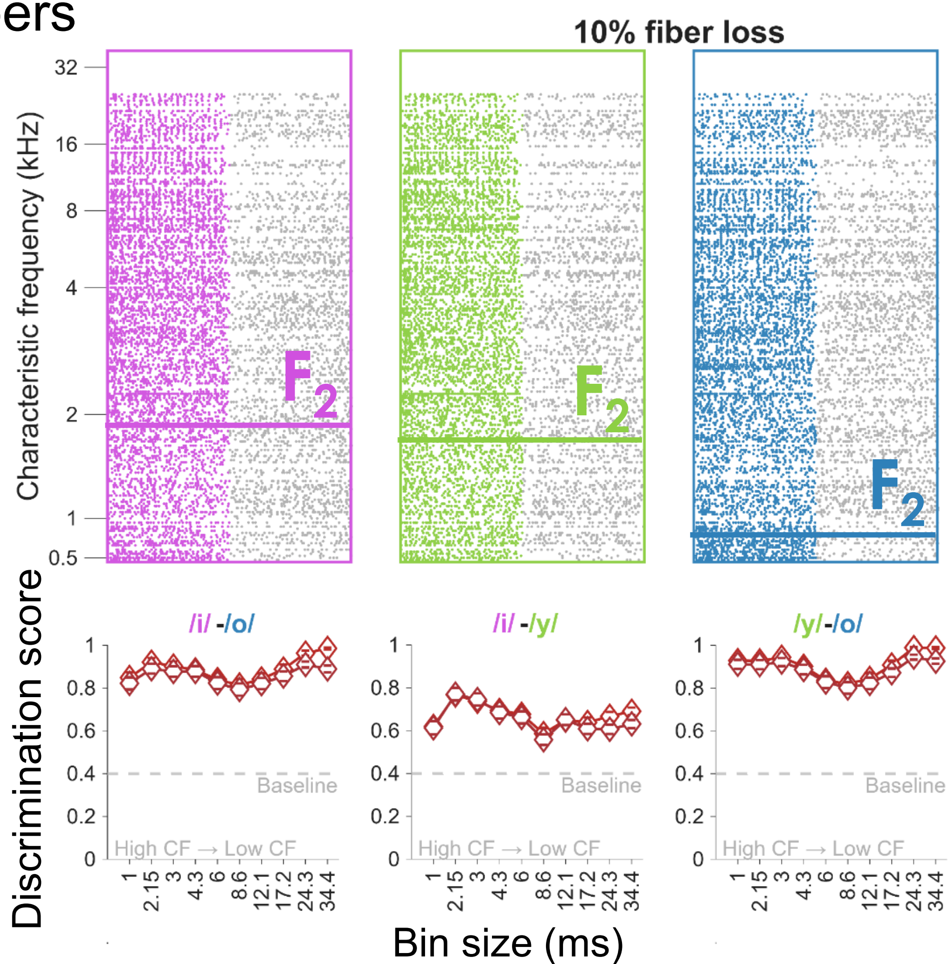
Scenario 2 : perte de fibres **« de la base à l'apex »**

n = 246 fibers



Scenario 2 : perte de fibres **« de la base à l'apex »**

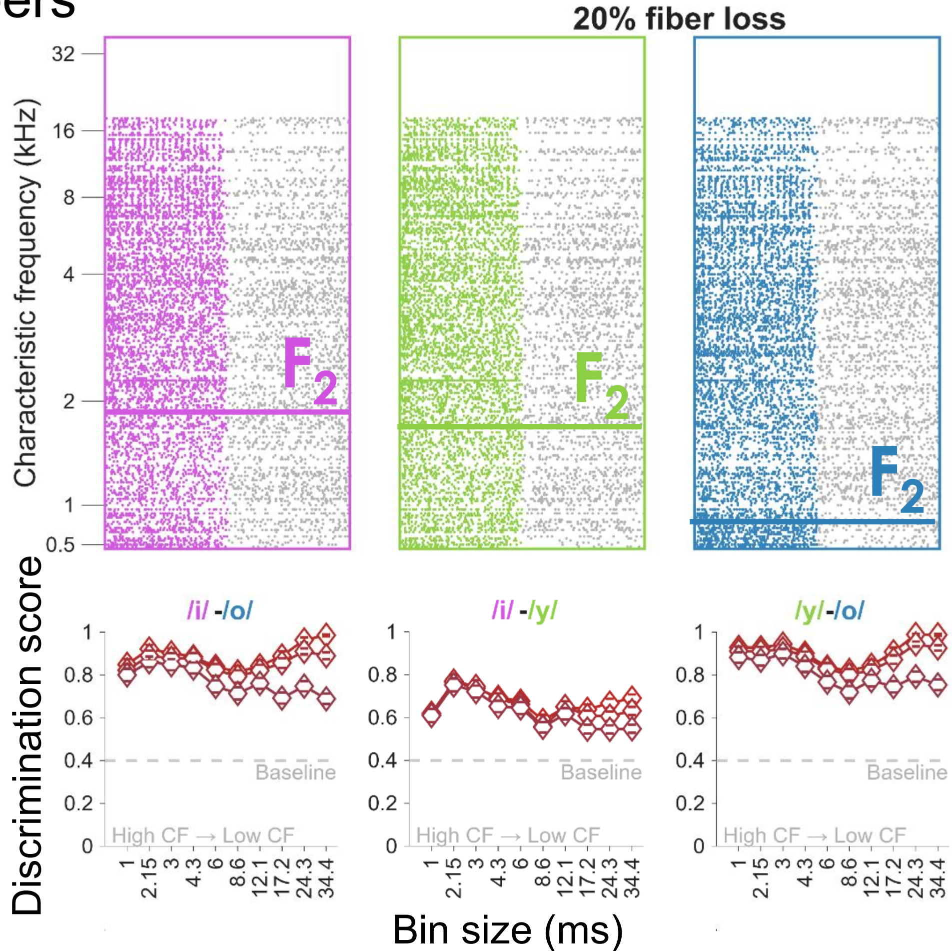
n = 221 fibers



10 % de perte

Scenario 2 : perte de fibres **« de la base à l'apex »**

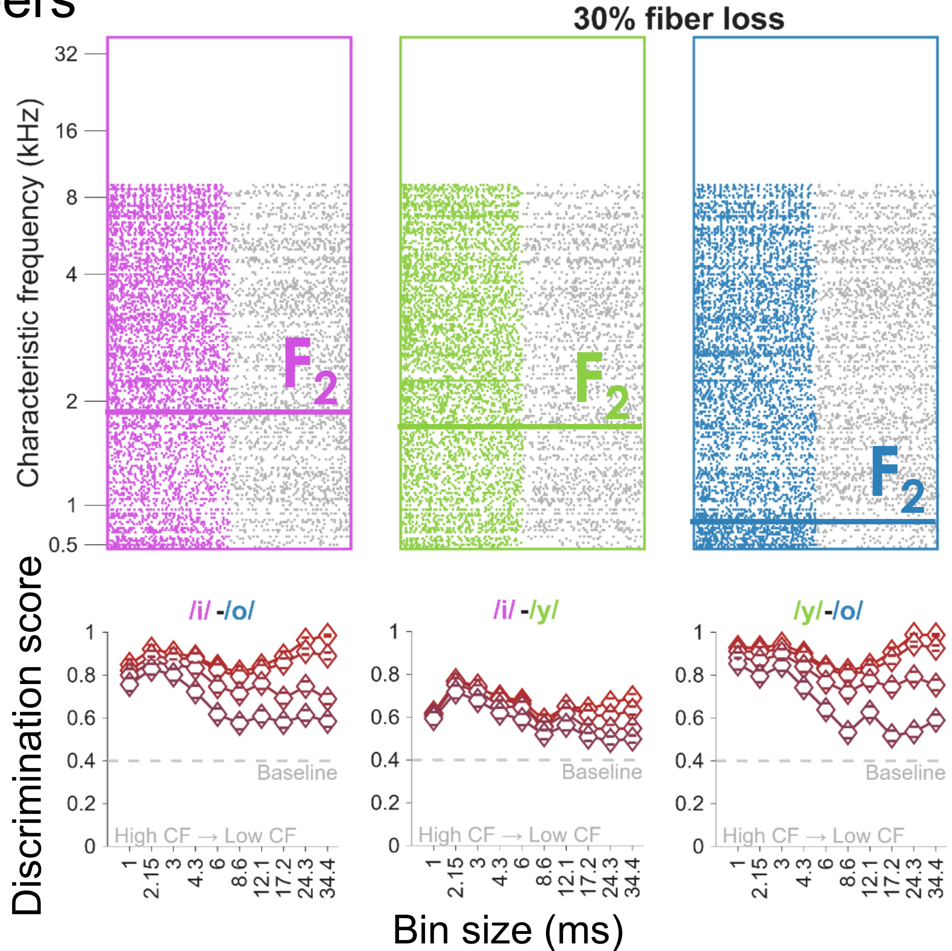
n = 197 fibers



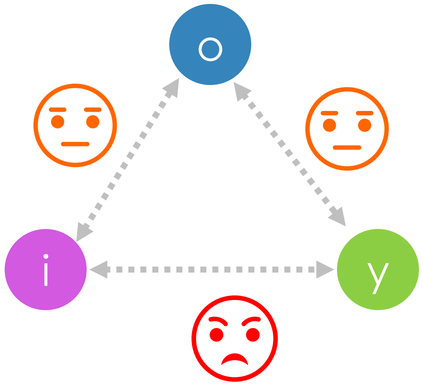
20 % de perte

Scenario 2 : perte de fibres **« de la base à l'apex »**

n = 172 fibers

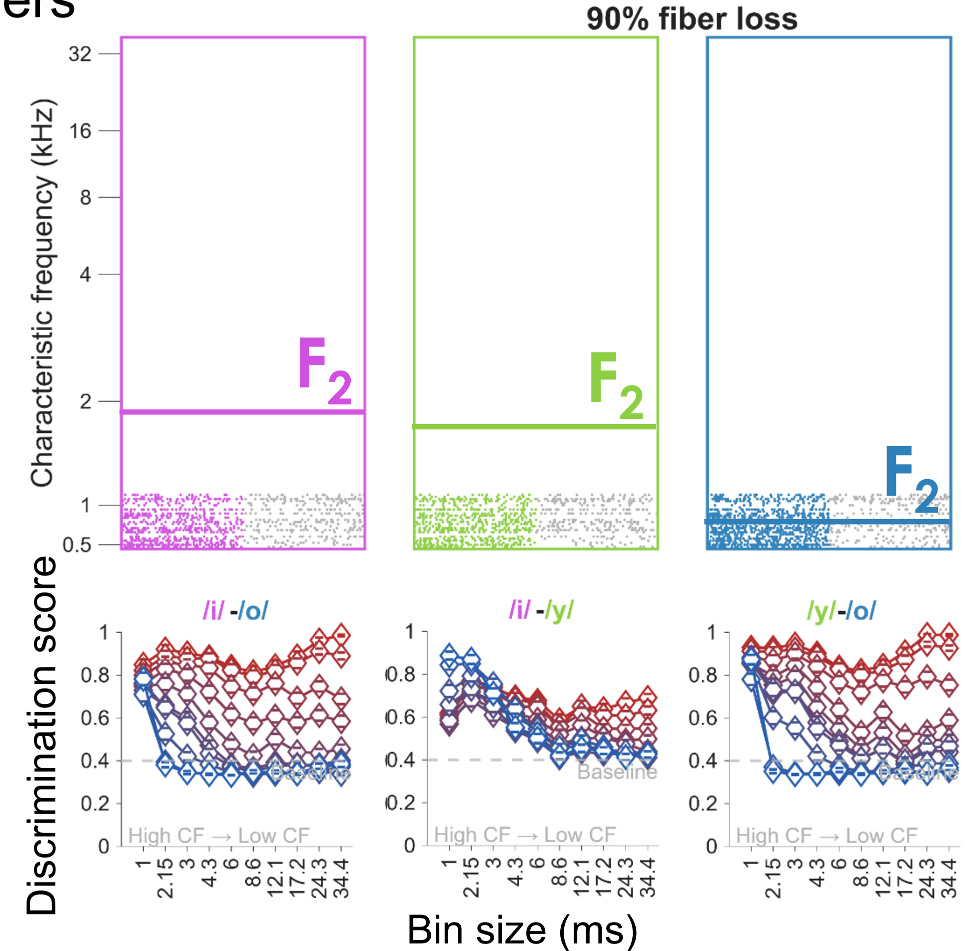


30 % de perte

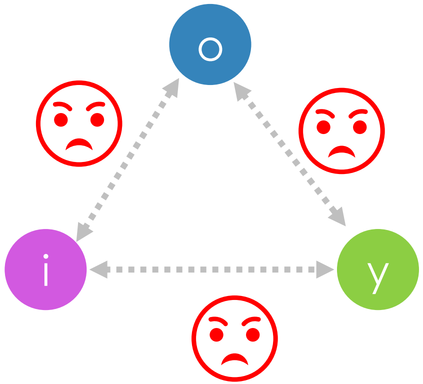


Scenario 2 : perte de fibres **« de la base à l'apex »**

n = 25 fibers

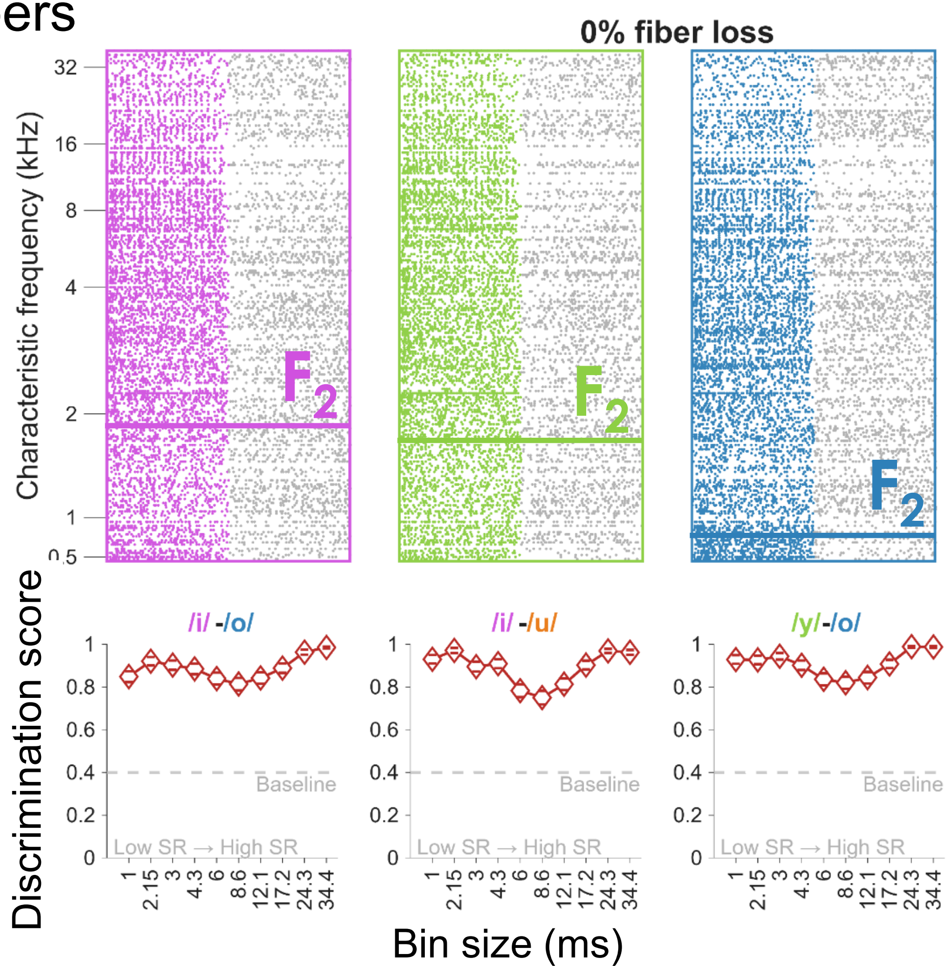


90 % de perte



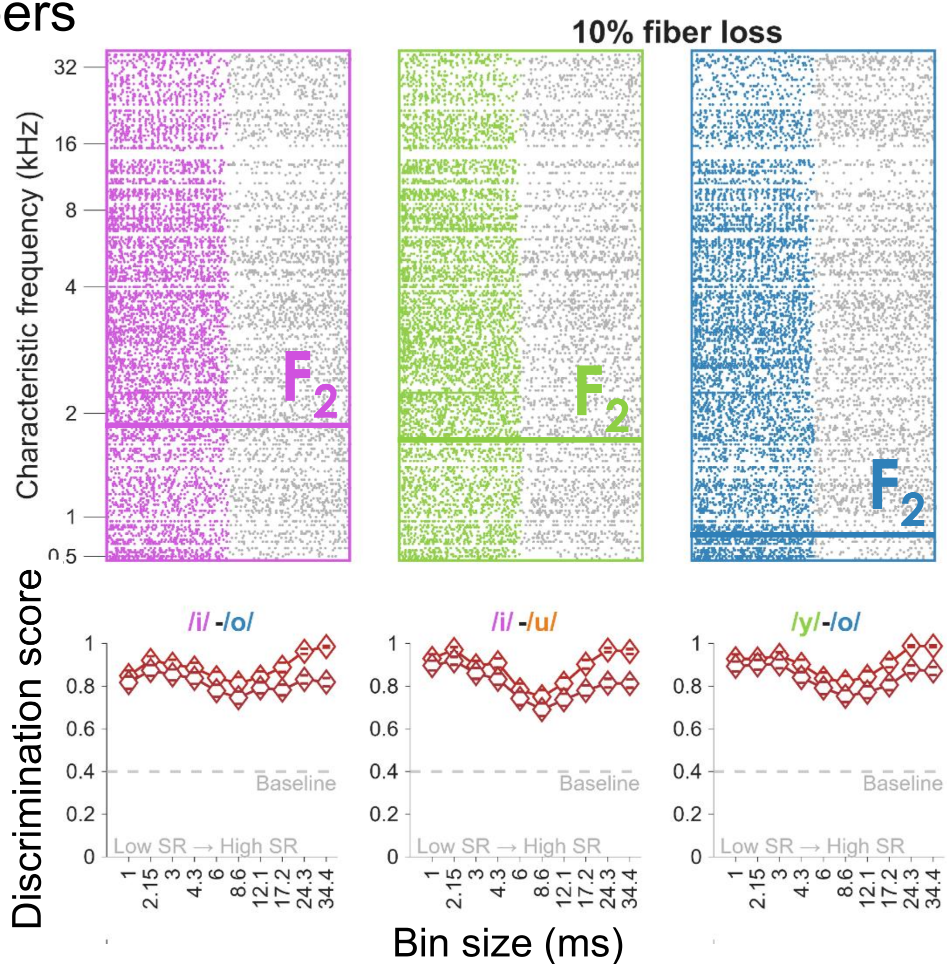
Scenario 3: Perte de fibres à basse activité spontanée

n = 246 fibers



Scenario 3: Perte de fibres à basse activité spontanée

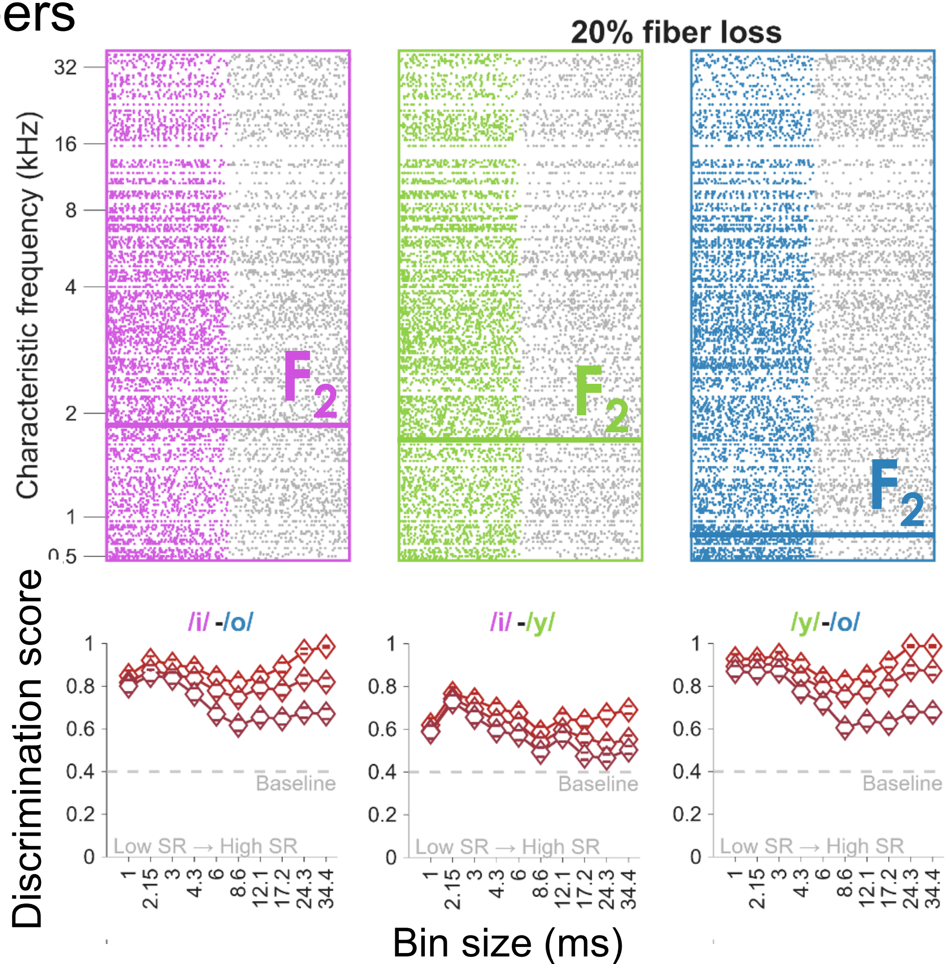
n = 221 fibers



10 % de perte

Scenario 3: Perte de fibres à basse activité spontanée

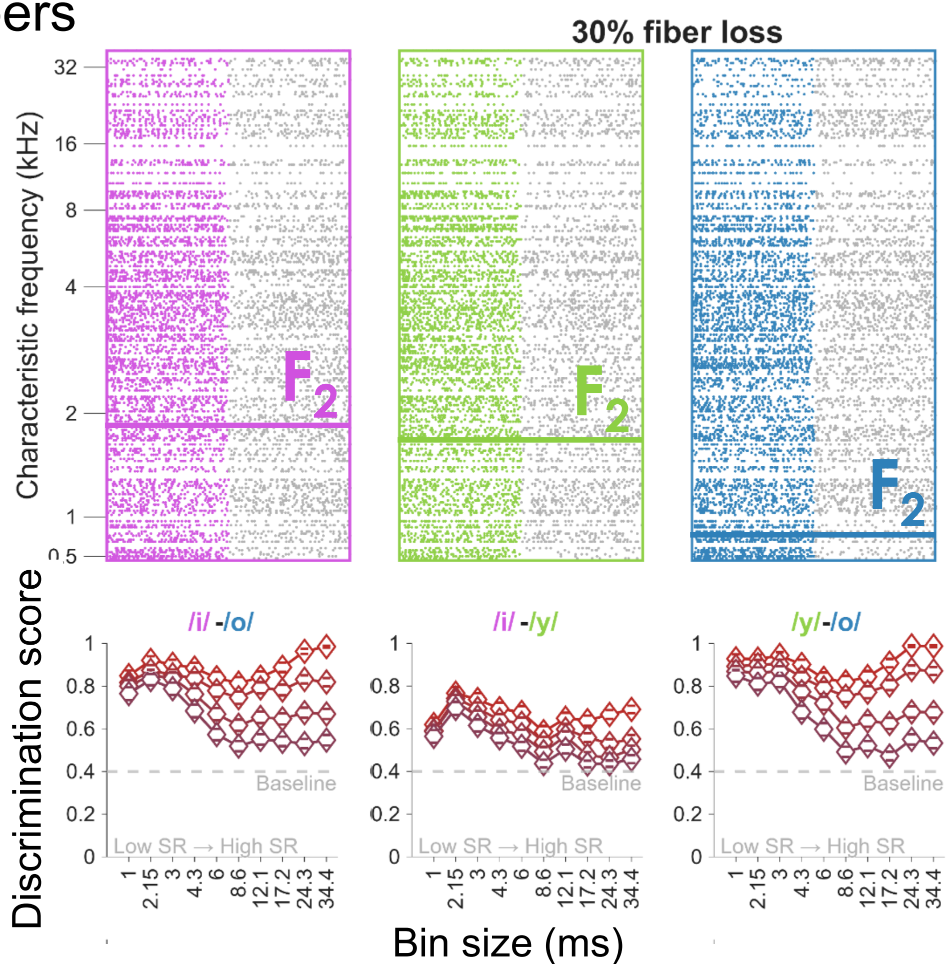
n = 197 fibers



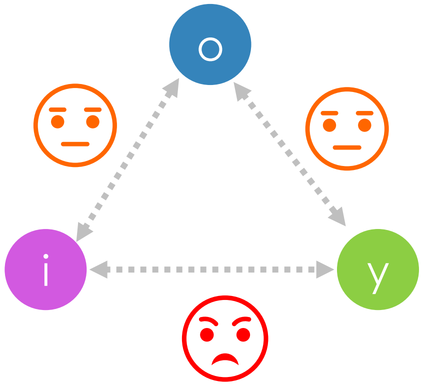
20 % de perte

Scenario 3: Perte de fibres à basse activité spontanée

n = 172 fibers

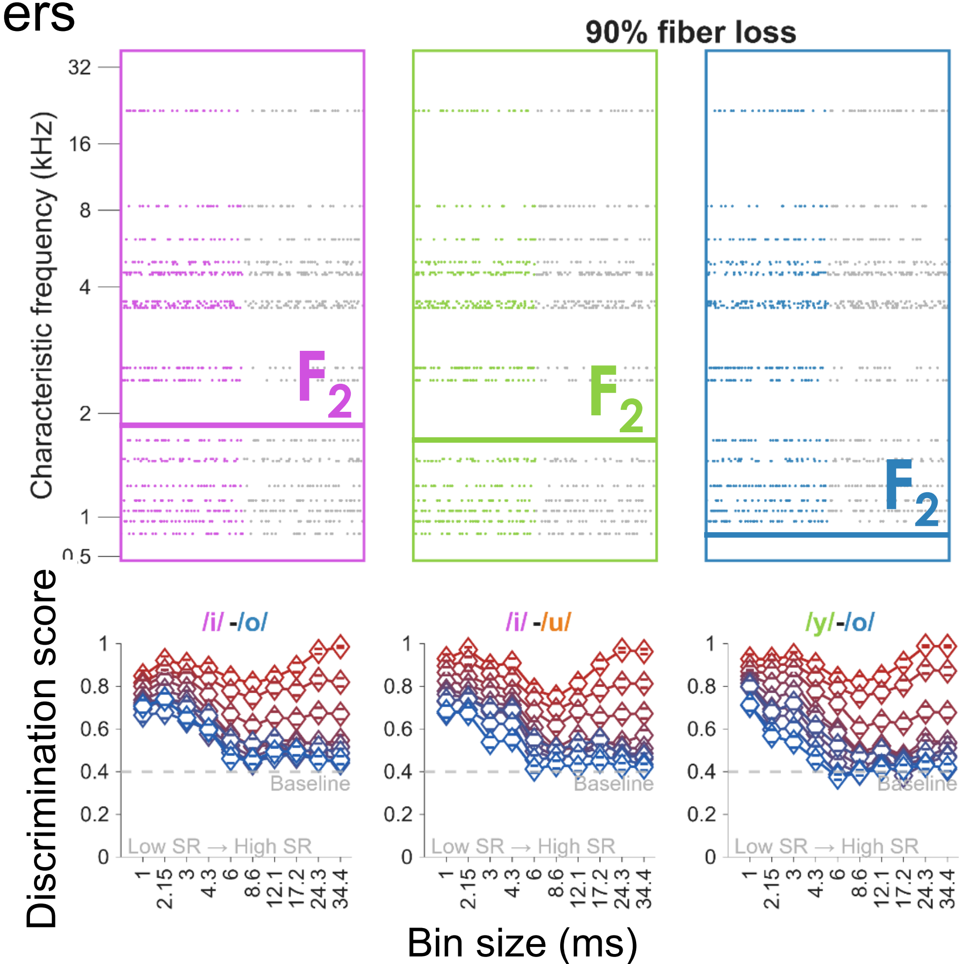


30 % de perte

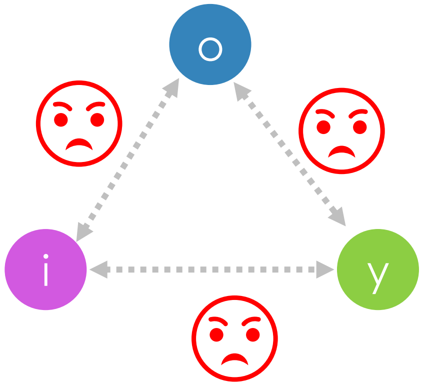


Scenario 3: Perte de fibres à basse activité spontanée

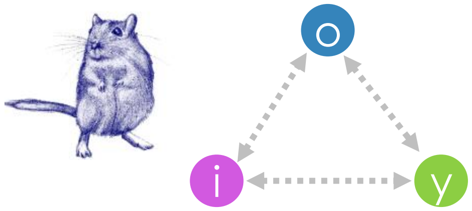
n = 25 fibers



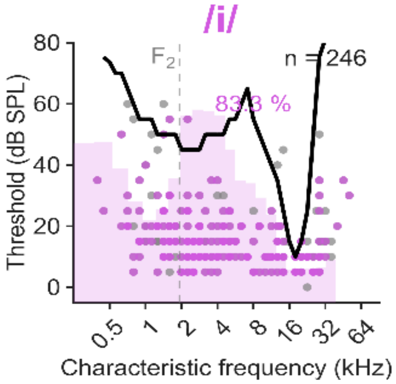
90 % de perte



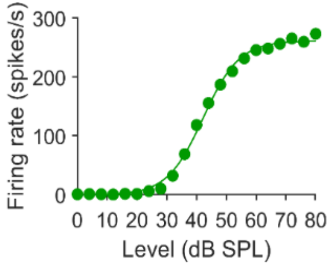
Conclusion générale



1. La **gerbille** est un modèle animal pertinent



2. Les **fibres de la base** (CF > 8 kHz) jouent un rôle important dans le codage des voyelles



3. Les fibres à **basse activité spontanée (low-SR fibers)** jouent un rôle important dans le codage des voyelles