# 【文献調査】
# Non-negative matrix factorization of multimodal MRI, fMRI and phenotypic data reveals differential changes in default mode subnetworks in ADHD

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## 1 タイトル

マルチモーダル MRI，fMRI および表現型データの非負行列分解は，ADHD におけるデフォルトモードサブネットワークの差異を明らかにする

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## 3 出典

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## 4 アブストラクト

マルチモーダルニューロイメージングフレームワークでは，1 人の被験者に関するデータが，機能的 MRI，構造的 MRI，行動的および/または表現型情報などの固有の異なるソースから収集される．各ソースが提供する情報は独立したものではない．各モダリティの特徴のサブセットは，生成モデルを使用して解釈できる 1 つ以上の共通の潜在的な大きさにマップする．これらの潜在的な次元または「トピック」は，各個人の機能の背後にある生成プロセスのまばらな概要を提供する．教師なしの生成モデルであるトピックモデリングは，一見異なる機能を共通の領域にマッピングするために使用されてきた．fMRI，MRI，表現型および行動測定を含むマルチモーダル ADHD データの潜在構造を推論するために，Non-Negative Matrix Factorization（NMF）を使用する．我々は 4 つの異なる NMF アルゴリズムを比較し，最も疎な分解が ADHD と健康な患者の間で最も差別的であることを見出した．モーション，デフォルトモードのネットワークアクティビティ，および入力データの他の特徴など，解釈可能で認識可能な範囲に対応するところを特定する．たとえば，ADHD-不注意診断でクラスタ化されたデフォルトモードのサブネットワークに関連する構造的および機能的なグラフ理論の機能である．後部帯状回，楔前部，および海馬傍回の領域などのデフォルトモードネットワーク（DMN）領域の構造測定は，すべて ADHD-不注意による診断に関連していた．腹側 DMN サブネットワークでは ADHD-I においてより多くの機能的接続があり，背側 DMN ではより少ない機能接続がある．ADHD のトピックは診断サイトに依存しており，地理的な場所の診断上の違いを示唆している．我々は，ADHD-200 分類競合に照らして我々の所見を評価し, 教師なしで指名されたトピックを以前に公開された教師あり学習方法と対比させる．最後に，これらの潜在変数の有効性を，730 例の患者における ADHD の分類に用いてバイオマーカーとして示す．累積的に，この原稿は，ADHD のマルチモーダルデータが潜在的な次元によってどのように解釈されるかを扱っている．

## 5 キーワード

Arterial blood pressure, Biomedical measurement, Blood pressure, Spectroscopy, Time-frequency analysis, Wavelet transforms

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