

学 位 論 文 の 要 旨

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〔題名〕

Sex difference in reinforcement learning under chronic stress
(慢性ストレス下における強化学習の性差)

〔要旨〕

The neurobiological literature implicates chronic stress induced decision-making deficits as a major contributor to depression and anxiety. Given that females are twice as likely to suffer from these disorders, we hypothesized the existence of gender difference in the effects of chronic stress on decision-making. Here employing decision-making paradigm that relies reinforcement-learning of probabilistic predictive relationships, we show female volunteers with a high level of perceived stress in the past month are more likely to make suboptimal choices than males. Computational characterizations of this sex difference suggest that while under high stress, females and males differ in their weighting but not learning of the expected uncertainty in the predictive relationships. These findings provide a mechanistic account of the sex difference in decision-making under chronic stress and may have important implications for the epidemiology of sex difference in depression and anxiety.

作成要領

1. 要旨は、800字以内で、1枚でまとめること。
2. 題名は、和訳を括弧書きで記載すること。

学位論文審査の結果の要旨

令和 4年 8月 5日

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学位論文題目名 (題目名が英文の場合、行を変えて和訳を括弧書きで記載する。)			
Sex difference in reinforcement learning under chronic stress (慢性ストレス下における強化学習の性差)			
学位論文の関連論文題目名 (題目名が英文の場合、行を変えて和訳を括弧書きで記載する。)			
Sex difference in the weighting of expected uncertainty under chronic stress (慢性ストレス下における不確実性に対する確率荷重の性差)			
掲載雑誌名 Scientific Reports			
第11巻 第 8700 号 P. ~ (2021年 4月 (掲載)・掲載予定)			
著者 (全員を記載)			
Huijie Lei, Yasuhiro Mochizuki, Chong Chen, Kosuke Hagiwara, Masako Hirotsu, Toshio Matsubara & Shin Nakagawa			
(論文審査の要旨)			
<p>Chronic stress-induced deficits in decision-making contribute to the development of depression and anxiety. Given that females are twice as likely to suffer from these disorders, the present study explores the potential sex difference in the effects of chronic stress on decision-making. Sixty-five healthy adults (age: 22.46 ± 5.91 years, 58.5% females) completed a reinforcement learning (RL) based decision-making task. Chronic stress was measured by the Perceived Stress Scale. RL computational models were used to probe the mechanistic processes of decision-making.</p> <p>The results indicated that under high perceived stress, females choose less "correct" choices that had a higher expected value compared to males. The computational models suggested the sex difference in choice performance was explained by probability weighting but not learning of the expected uncertainty under high stress. Compared to males, females were more likely to underweight small probabilities and overweight large probabilities.</p> <p>These findings provide a mechanistic account of the sex difference in decision-making under chronic stress and may have important implications for the epidemiology of the sex difference in depression and anxiety.</p> <p>本論文は、慢性ストレスと強化学習に基づく意思決定との関係に性差があることを発見し、計算モデルからの結果は、この性差が学習率ではなく確率重み付けの性差によって説明できることが示唆されることを報告したものであり、学位論文として価値あるものと認められた。</p>			
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