

業績説明書

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所属機関：新潟大学人文社会科学系

(2024年1月現在)

論文 11. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & O'Toole, A. J. (2021). Cortical processing of dynamic bodies in the superior occipito-temporal regions of the infants' brain: Difference from dynamic faces and inversion effect. *NeuroImage*, *244*, 118598.

動的な身体および顔の処理は、側頭領域上部を含む視覚経路の関与が示唆されている (Pitcher & Underleider, 2021)。本研究では動的な身体処理の乳児期の発達を検討し、顔処理との比較を行った。女性が接近する動画の顔にボカシ（身体のみ観察可能）あるいは身体にボカシをかけた刺激（顔のみ観察可能）に対する生後 5-8 ヶ月児の後側頭領域の脳活動を計測した。その結果、身体への反応は生後 5 ヶ月から後側頭領域の上部でみられ月齢による変化はなかったが、この脳活動パターンは刺激を倒立にすると消失した。さらに、側頭領域上部において身体処理の倒立効果が示された。これらの結果は、側頭領域上部における身体特有の脳処理は生後 5 ヶ月までに発達することを示唆する。

論文 10. **Kobayashi, M.**, Ikeda, T., Tokuda, T., Monden, Y., Nagashima, M., Mizushima, S. G., Inoue, T., Shimamura, K., Ujiie, Y., Arakawa, A., Kuroiwa, C., Ishijima, M., Kishimoto, Y., Kanazawa, S., Yamagata, T., Yamaguchi, M. K., Sakuta, R., & Dan, I. (2020). Acute administration of methylphenidate differentially affects cortical processing of emotional facial expressions in ADHD children as studied by functional near-infrared spectroscopy. *Neurophotonics*, *7(2)*, 025003.

注意欠如多動症 (ADHD) では、注意機能や実行機能だけでなく表情認知の障害も示す。本研究では学童期 ADHD の表情認知障害の神経基盤と治療薬の効果を検討するため、治療薬(塩酸メチルフェニデート)およびプラセボの服薬前後での笑顔と怒り顔観察時における、ADHD 児の側頭領域の脳活動を近赤外分光法 (NIRS) で計測した。その結果、笑顔観察時には服薬の種類や有無に関わらず右下後頭回が活動する一方、怒り顔では服薬後のみ左下後頭回が活動がみられた。本研究の結果は、(1) ADHD 児童の笑顔処理は定型発達児と同様に右半球優位だが、感情価よりも形態的情報の処理に依存する、(2) 治療薬によって怒り顔の形態的情報の処理が促進されることを示唆するものである。

論文 7. **Kobayashi, M.**, Macchi Cassia, V., Kanazawa, S., Yamaguchi, M. K., & Kakigi,

R. (2018). Perceptual narrowing towards adult faces is cross-cultural phenomenon in infancy: A behavioral and near-infrared spectroscopic study with Japanese infants. *Developmental Science*, 21(1), e12498.

本研究では、若年成人顔への知覚狭小化が日本人乳児でもみられるか、またその神経基盤を検討した。実験 1 では生後 3 ヶ月・9 ヶ月児を対象に新生児の顔および若年成人顔の弁別を調べた結果、生後 3 ヶ月児は両年齢の顔を弁別できる一方、生後 9 ヶ月児は若年成人顔のみ弁別できた。実験 2 では、生後 9 ヶ月児を対象に乳児顔・成人顔観察時の脳活動を NIRS を用いて計測した。その結果、成人顔観察時のみ物体ベースラインと比較して右半球の後部側頭領域が有意に賦活し、新生児の顔観察時の活動と有意差が認められた。本研究は、生後 9 ヶ月頃に生じる若年成人顔への知覚狭小の通文化性を示し、若年成人顔に対してのみ顔の全体処理が適応されるように知覚狭小が生じることを示唆している。

論文 2. Kobayashi, M., Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2012). Do infants recognize the Arcimboldo images as faces? Behavioral and near-infrared spectroscopic study. *Journal of Experimental Child Psychology*, 111, 22-36.

本研究ではアルチンボルドの顔のだまし絵を用いて、顔検出能力の発達とその神経基盤を検討した。実験 1 では、生後 5-6 ヶ月児・7-8 ヶ月児に正立と倒立のだまし絵を提示し、正立顔への選好を調べた。その結果、生後 7-8 ヶ月児のみ正立のだまし絵への有意な選好が示された。実験 2 では、正立と倒立のだまし絵観察中の生後 7-8 ヶ月児の脳活動を NIRS によって計測し、正立のだまし絵観察時に左側頭領域の活動が有意に上昇することを示した。本研究の結果は、顔の布置情報への感受性に基づいただまし絵からの顔検出は生後 7 ヶ月ごろに発達し、その処理には左側頭領域が関与することを示唆するものである。

論文 1. Kobayashi, M., Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2011). Do infants represent the face in a viewpoint-invariant manner? Neural adaptation study as measured by near-infrared spectroscopy. *Frontiers in Human Neuroscience*, 5:153.

本研究では、成人 fMRI 研究で確立されている神経順応パラダイムを乳児の NIRS 計測に適用することで、顔の人物情報処理の発達を検討した。実験 1 では、「同一人物の顔を反復提示する条件」と「複数人物の顔を提示する条件」に対する後側頭領域の血流反応を計測した結果、生後 5-8 ヶ月児の両半球側頭領域で、同一の顔刺激に対する脳活動の減衰（神経順応）が認められた。実験 2 では顔刺激に向きの変化を加えたところ、生後 7-8 ヶ月児のみ同一人物の顔に対する神経順応が示された。本研究は、神経順応パラダイムが乳児の NIRS 計測にも適用できることを世界で初めて報告し、後側頭領域における人物情報処理の発達変化を示唆するものである。

業績目録

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a. 外国語による論文・著書（分担執筆を含む）【総被引用数：214】

12. ***Kobayashi, M.**, Kanazawa, S., & Yamaguchi, M. K. (2023). The role of scenic context on upright face preference in infancy. *PLoS ONE*, *18*(7), e0288253. [被引用数: 1, IF: 3.7]
- ※11. ***Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & O'Toole, A. J. (2021). Cortical processing of dynamic bodies in the superior occipito-temporal regions of the infants' brain: Difference from dynamic faces and inversion effect. *NeuroImage*, *244*, 118598. [被引用数: 1, IF: 5.7]
- ※10. **Kobayashi, M.**, Ikeda, T., Tokuda, T., Monden, Y., Nagashima, M., Mizushima, S. G., Inoue, T., Shimamura, K., Ujiie, Y., Arakawa, A., Kuroiwa, C., Ishijima, M., Kishimoto, Y., Kanazawa, S., Yamagata, T., Yamaguchi, M. K., Sakuta, R., & Dan, I. (2020). Acute administration of methylphenidate differentially affects cortical processing of emotional facial expressions in ADHD children as studied by functional near-infrared spectroscopy. *Neurophotonics*, *7*(2), 025003. [被引用数: 8; IF: 2.537]
9. **Kobayashi, M.**, Kakigi, R., Kanazawa, S., & Yamaguchi, M. K. (2020). Infants' recognition of their mothers' faces in facial drawings. *Developmental Psychobiology*, *62*(8), 1011-1020. [被引用数: 8, IF: 2.2]
8. Tokuda, T., Ikeda, T., Monden, Y., Mizushima, S. G., Inoue, T., Nagashima, M., Shimamura, K., Arakawa, A., **Kobayashi, M.**, Kuroiwa, C., Ujiie, Y., Dan, H., Kyutoku, Y., Taniguchi, T., Shimoizumi, H., Yamagata, T., Yamaguchi, M. K., Kanazawa, S., Sakuta, R., & Dan, I. (2018). Methylphenidate-elicited distinct neuropharmacological activation patterns between medication-naive attention deficit hyperactivity disorder children with and without

comorbid autism spectrum disorder: A functional near-infrared spectroscopy study. *Neuropsychiatry*, 8(3), 917-929. [IF: 0.23]

- ※7. **Kobayashi, M.**, Macchi Cassia, V., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2018). Perceptual narrowing towards adult faces is cross-cultural phenomenon in infancy: A behavioral and near-infrared spectroscopic study with Japanese infants. *Developmental Science*, 21(1), e12498. [被引用数: 33, IF: 4.939]

※本論文は掲載号の表紙に選出された（「c. その他国際的業績」参照）

6. Inoue, T., Sakuta, Y., Shimamura, K., Ichikawa, H., **Kobayashi, M.**, Otani, R., Yamaguchi, M. K., Kanazawa, S., Kakigi, R., & Sakuta, R. (2015). Differences in the pattern of hemodynamic response to self-face and stranger-face images in adolescents with anorexia nervosa: A near-infrared spectroscopic study. *PLOS ONE*, 10(7), e0132050. [IF: 3.7]
5. **Kobayashi, M.**, Otsuka, Y., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2014) The processing of faces across non-rigid facial transformation develops at 7 month of age: A fNIRS-adaptation study. *BMC Neuroscience*, 15:81. [被引用数: 26, IF: 3.3]
4. Otsuka, Y., Motoyoshi, I., Hill, H., **Kobayashi, M.**, Kanazawa, S., & Yamaguchi M.K. (2013). Eye contrast polarity is critical for face recognition by infants. *Journal of Experimental Child Psychology*, 115(3), 598-606. [IF: 2.6]
3. **Kobayashi, M.**, Otsuka, Y., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2012). Size-invariant representation of face in infant brain: fNIRS-adaptation study. *NeuroReport*, 23(17), 984-988. [被引用数: 30, IF: 1.7]
- ※2. **Kobayashi, M.**, Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2012). Do infants recognize the Arcimboldo images as faces? Behavioral and near-infrared spectroscopic study. *Journal of Experimental Child Psychology*, 111, 22-36. [被引用数: 56, IF: 3.3]
- ※1. **Kobayashi, M.**, Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2011). Do infants represent the face in a viewpoint-

invariant manner? Neural adaptation study as measured by near-infrared spectroscopy. *Frontiers in Human Neuroscience*, 5:153. [被引用数: 51, IF: 2.9]

b. 国際学会・海外学会での発表・講演等

22. **Kobayashi, M.**, Sugai, M., Kanazawa, S., Yamaguchi, M. K., (2023/8/27-31). Face experience may modulate preference for mother's faces in infants raised during the COVID-19 pandemic in Japan. European Conference on Visual Perception (ECVP) 2023, Paphos, Cyprus.
21. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & O'Toole, A. J. (2022/10/9-12). Development of cortical processing of dynamic bodies in infancy. fNIRS 2022, Boston, USA.
20. **Kobayashi, M.** & Yamaguchi, M. K. (2022/7/7-10). The impact of COVID-19 outbreak on infant's processing of the mother's face. XXIII International Conferences on Infant Studies 2022 (Symposium: "The impact of COVID-19 restrictions on early cognitive development across the world"), Ottawa, Canada
19. **Kobayashi, M.** (2022/6/1-2). Nine-month-old infants can recognize a caricature of their mother's faces. V-VSS 2022, Online
18. Macchi Cassia, V., Shirai, N., **Kobayashi, M.**, Arioli, M., Bulf, H., Yamaguchi, M. K. (2020/7/6-9). Spatial biases in infants' learning of serial order: evidence for the role of cultural experience. vICIS 2020 Congress, Online.
17. **Kobayashi, M.**, Nagashima, M., Tokuda, T., Ikeda, T., Monden, Y., Kanazawa, S., Yamaguchi, M. K., Sakuta, R., Yamagata, T., & Dan. I. (2019/5/17-22). The neural basis underlying impaired recognition of angry expression in ADHD children measured by near-infrared spectroscopy. Vision Sciences Society 19th Annual Meeting, Florida, USA.
16. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & O'Toole, A. J. (2018/7/13-16). Development of recognition of approaching walkers.

The 14th Asia-Pacific Conference on Vision & The 3rd China Vision Science Conference. (Symposium: "Linking objects from vision and beyond: Development across life span"), Hangzhou, China.

15. Macchi Cassia, V., Shirai, N., **Kobayashi, M.**, Bulf, H., & Yamaguchi, M. K. (2018/6/30-7/3). Does early exposure to culturally-driven routines modulate visual rule learning abilities? Evidence from Japanese infants. 21st Biennial International Congress of Infant Studies Biennial Congress, Philadelphia, USA.
14. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & O'Toole, A. J. (2018/5/18-23). Recognition of approaching walkers in infancy. Vision Sciences Society 18th Annual Meeting, Florida, USA.
13. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2017/5/19-24). Infants' face detection in natural scene. Vision Sciences Society 17th Annual Meeting, Florida, USA.
12. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & O'Toole, A. J. (2017/4/5). Infants' recognition of approaching people. (Invited talk) Society for Research in Child Development 2017 Biennial Meeting, Face Processing Pre-Conference, Austin, USA.
11. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2016/5/13-18). Infants' recognition of caricature of mother's face. Vision Sciences Society 16th Annual Meeting, Florida, USA.
10. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2015/7/10-12). Developmental changes in face identity processing: fNIRS-adaptation studies. The 11th Asia-Pacific Conference on Vision, Singapore.
9. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., Kakigi, R., & Lee, K. (2015/5/15/20). Neural correlates of own- and other-race face processing in infants: A near-infrared spectroscopic study. Vision Sciences Society 15th Annual Meeting, Florida, USA.
8. **Kobayashi, M.**, Otsuka, Y., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2014/10/10-12) The processing of faces across non-rigid facial transformation develops at 7 month of age: A fNIRS adaptation study.

fNIRS 2014, Montreal, Canada.

7. Yamaguchi, M. K., & **Kobayashi, M.** (2014/7/3-5). Processing of facial identity in infants' brain: fNIRS-adaptation studies. (Symposium) The 19th Biennial International Conferences on Infant Studies, Berlin, Germany.
6. Proietti, V., **Kobayashi, M.**, Quadrelli, E., Bulf, H., Kanazawa, S., Yamaguchi, M. K. & Macchi Cassia, V. (2013/9/4-6). Cross-cultural evidence of perceptual narrowing toward adult faces in 3- and 9-month-old infants. BPS Joint Cognitive and Developmental Sections Annual Conference 2013, University of Reading, UK.
5. **Kobayashi, M.**, Otsuka, Y., Kanazawa, S., Yamaguchi, M.K., & Kakigi, R. (2012/6/7-9). Face representation in infant temporal region investigated by the neural adaptation paradigm; the near-infrared spectroscopic study. 18th Biennial International Conference on Infant Studies, Minneapolis, USA.
4. **Kobayashi, M.**, Otsuka, Y., Kanazawa, S., Yamaguchi, M.K., & Kakigi, R. (2011/5/6-11). Do infant represent the facial identity in a viewpoint-invariant manner? The neural adaptation study as measured by near-infrared spectroscopy. Vision Sciences Society 11th Annual Meeting, Florida, USA.
3. **Kobayashi, M.**, Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M.K., Kakigi, R. (2010/5/7-12). Adaptation effect for facial identity in infants. Vision Sciences Society 10th Annual Meeting, Florida, USA.
2. Otsuka, Y., Motoyoshi, I., **Kobayashi, M.**, Hill, H., Kanazawa, S., Yamaguchi, M.K. (2009/5/8-13) . Face discrimination in infants and adults: the role of contrast polarity of the eyes. The Vision Sciences Society 9th Annual Meeting, Florida, USA.
1. **Kobayashi, M.**, Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M.K., Kakigi, R. (2009/5/8-13). Do infants recognize the Arcimbold images as faces? Behavioral and Near-infrared spectroscopic study. The Vision Sciences Society 9th Annual Meeting, Florida, USA.

c. その他国際的な業績

国際学術誌の表紙

1. **Kobayashi, M.**, Macchi Cassia, V., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2018). Cover Image. *Developmental Science*, *21(1)*, e12652.
<https://onlinelibrary.wiley.com/doi/10.1111/desc.12652>
※論文番号 7 の研究成果を元に作成した Graphical Abstract が表紙として選出された

国内で発行された雑誌等に掲載された英語論文

1. **Kobayashi, M.**, Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2016). Infant recognition of caricature of mother's face. (Summary of Awarded Presentation) *The Japanese Journal of Psychonomic Science*, *35(1)*, 97-98.

国内で開催された国際学会等での発表

8. **Kobayashi, M.** (2020/12/10). Development of face processing in infancy. Workshop- Dyadic interactions in a comparative perspective, Virtual.
7. **Kobayashi, M.**, Nagashima, M., Tokuda, T., Ikeda, T., Monden, Y., Kanazawa, S., Yamaguchi, M. K., Sakuta, R., Yamagata, T., & Dan, I. (2019/7/29-8/1). Identifying cortical area for processing of emotional facial expressions in ADHD children measured by near-infrared spectroscopy. 15th Asia-Pacific Conference on Vision. Rikkyo University, Japan.
6. **Kobayashi, M.** (2019/2/15-16). Inhibitory function assessed by prepulse inhibition in auditory change-related brain activity. (Invited Lecture) 11th NAGOYA Global Retreat, Obu, Japan.
5. **Kobayashi, M.**, Macchi Cassia, V., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2016/7/24-29). Perceptual narrowing towards adult faces is a cross-cultural phenomenon in infancy: A behavioral and near-infrared spectroscopy study with Japanese infants. (Invited Symposium) ICP 2016: The 31st International Congress of Psychology, Yokohama, Japan.
4. **Kobayashi, M.**, Macchi Cassia, V., Kanazawa, S., Yamaguchi M. K., &

- Kakigi, R. (2014/7/18-22) Perceptual narrowing toward adult faces in Japanese infants: a behavioral and a near-infrared spectroscopic study. The 10th Asia-Pacific Conference on Vision, Takamatsu, Japan.
3. **Kobayashi, M.**, Otsuka, Y., Kanazawa, S., Yamaguchi M. K., & Kakigi, R. (2012/10/30-11/3). Development of facial representation in infancy: NIRS-adaptation study. 43rd NIPS International Symposium: Face Perception and Recognition, Okazaki, Japan.
 2. Otsuka, Y., Motoyoshi, I., Hill, H., **Kobayashi, M.**, Kanazawa, S., & Yamaguchi M.K. (2012/10/30-11/3). The role of contrast polarity of eyes on face recognition by 7-to-8month-olds. 43rd NIPS International Symposium: Face Perception and Recognition, Okazaki, Japan.
 1. **Kobayashi, M.**, Otsuka, Y., Nakato, E., Kanazawa, S., Yamaguchi, M. K., & Kakigi, R. (2010/12/16-18). Is the faces represented in a viewpoint-invariant manner? Neural adaptation study as measured by near-infrared spectroscopy. 41st NIPS International Symposium, Okazaki, Japan.

海外研究室での講演

- The University of Texas at Dallas (USA, 2016/8)
- Bournemouth University (UK, 2014/2)
- The University of Milano-Bicocca (Italy, 2013/2)
- The University of Toronto (Canada, 2011/11, 2012/2)
- The University of Western Australia (Australia, 2011/3)

国際学術誌における査読

- Cerebral Cortex
- Developmental Science
- Journal of Neuroimaging
- Perception
- Scientific Reports
- Frontiers in Psychology
- Japanese Psychological Research
- Vision Research

- Psychologia
- Neuroscience Insight

海外研究助成機関における研究費申請書査読

- National Institute of Health (NIH), USA
- National Science Foundation (NSF), USA

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- Frontiers in Cognition: Review Editor

(<https://www.frontiersin.org/journals/cognition/editors>)

以上