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研究課題名(和文) 対人同期運動時における自己境界の拡張に関する研究

研究課題名(英文) You are me - interpersonal synchronization body movements extend boundary of self

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研究成果の概要(和文)：自己の境界は行動の主題を特定する。これは私たちの日々の行動のアイデンティティを確立するために非常に重要である。本研究は、対人関係から自己の境界を探ることを目的としており、特に対人相互作用における自己の境界はどのようなものであるのかを探ることを目的としている。行動実験では、参加者と実験者の手の動きの間の同期が確立された。アンケートの結果によると、参加者は対人同期中にエージェンシーと所有権を経験していることが確認された。これらの結果は、エージェンシーと所有権が対人的同期のみによって引き出されることを示唆している。したがって、自己の境界は対人相互作用の間に広がる可能性がある。

研究成果の学術的意義や社会的意義

対人相互作用の間のエージェンシーと所有権の誘発は、人間が自分自身の動きからだけでなく他の人の同期的な動きからもエージェンシーと所有権の感覚を経験できることを示唆した。その答えが私たちを人間の社会性の起源とし、ヒューマン-マシンインターフェース技術のさらなる急速な発展に導くため、自己の境界の拡大を調査することは非常に重要である。

研究成果の概要(英文)：The boundary of self specifies the subject of behaviors. This is quite important for establishing our behavioral identity in our daily. Although most previous studies showed that the boundary of self could extend using a mirror or rubber hand, these previous studies investigated the boundary of self from an intrapersonal aspect, which cannot state the boundary of self during interpersonal interaction. This research aims to investigate the boundary of self from an interpersonal aspect, and especially, how is the boundary of self during interpersonal interaction. In behavior experiment, the synchronization between participants and experimenter hand movements was established. According to the questionnaire results, participants seemed to experience agency and ownership during interpersonal synchronization. These results suggest that agency and ownership can be elicited by interpersonal synchronization alone. Therefore, the boundary of self could extend during interpersonal interaction.

研究分野：cognitive science

キーワード：boundary of self synchronization sense of agency sense of ownership

様式 C - 19、F - 19 - 1、Z - 19、CK - 19 (共通)

1 . 研究開始当初の背景

The boundary of self specifies the subject of behaviors. This is quite important for establishing our behavioral identity in our daily. However, the boundary of self sometimes gets fuzzy. In fact, most previous studies showed that the boundary of self could extend using a mirror or rubber hand. However, these previous studies investigated the boundary of self from an intrapersonal aspect, which cannot state the boundary of self during interpersonal interaction. In this regard, interpersonal interaction between humans is thought of as one important part of social life, and in particular, previous studies have reported that the synchronization of humans' body movements in interpersonal interaction could promote social bonding. Hence, it is necessary to investigate the boundary of self during interpersonal interaction, because there is little research on the boundary of self during interpersonal interaction.

In applicant's previous studies, because most previous studies paid attention to subjective perception only, I investigated how human perceives the external world during voluntary movement. These results suggest that voluntary movement obviously affects the subjective perception of the external world and this effect didn't limit in moving body part. Actually, our behaviors with voluntary movement frequently accompany face-to-face communication in daily lives, since voluntary movement is a fundamental part of interpersonal interaction in social life. This is also the reason I altered my research to psychology path in my doctoral degree from Biology in my master degree. From this fact, I conceived the idea of investigation of an effect of interpersonal synchronization body movements on extendibility of boundary of self.

2 . 研究の目的

The purpose of the research is to find out the effect of interpersonal body movements on the boundary of self and the related mechanism. In particular, the research is to make sure whether another's mirror symmetric movement is crucial for the elicitation of agency and ownership during interpersonal synchronization.

3 . 研究の方法

To answer the question of whether mirror symmetric movement is necessary for people to perceive a sense of agency and a sense of ownership during interpersonal synchronization, the experimenter mimicked the participant's right- or left-hand movements using mirrored and non-mirrored symmetrical movements. During the tasks, participants were always asked to look at the experimenter's open-and-close hand movements, rather than at their own hand movements. Then participants reported their perception of agency and ownership by questionnaire.

The experiment was conducted in a quiet experimental room. The participant sat comfortably at a table and put his/her hand into a wooden box. The box was placed on a table directly in front of participant, in alignment with the sagittal body midline. Each participant was paired with an experimenter of the same sex, who sat on the opposite side of the rectangular table. The distance between the participant's and experimenter's fingertips was around 50 cm. Prior to the experiment, each participant was asked to read instructions that introduced the procedures. The participant's task was to open and close his or her hand at approximately 1 s intervals. The participants received brief training in how to perform the appropriate open-and-close motion and how to use the digital timer for pacing.

In the synchronous mirrored condition, the participant was asked to perform the open-and-close motion with her or his right or left hand at approximately 1 Hz intervals for 60 s, and stare at the experimenter's hand motions while keeping her or his rhythm. The experimenter sat opposite the participant and synchronously moved her or his opposite hand in imitation of the participant's hand movements.

In the random mirrored condition, the experimenter performed the hand movements in sync with temporally random sounds rather than in sync with the participant's hand movements. The other procedures for this condition were the same as in the synchronous mirrored condition.

In the synchronous non-mirrored condition, the participants performed the open-and-close motion with their right or left hand, and the experimenter synchronously performed the motion with the same hand (right or left). The other procedures were the same as in the synchronous mirrored condition.

In the random non-mirrored condition, the experimenter performed the hand movements in sync with temporally random sounds rather than in sync with the participant's hand movements. The other procedures were the same as in the synchronous non-mirrored condition.

4 . 研究成果

The results of the of agency and ownership in questionnaire were analyzed in 2018. The absence of significant time series differences indicated that the agency and ownership ratings in all the synchronous conditions, including the mirrored and non-mirrored conditions, were comparable. According to the questionnaire results, participants seemed to experience agency and ownership during interpersonal synchronization in both the mirrored and non-mirrored conditions. This indicates that the mirrored movements are not necessary for participants to experience a sense of agency or a sense of ownership. These results suggest that agency and ownership can be elicited by interpersonal synchronization alone. The results also suggested that the perception of ownership (but not agency) seems to play a role in human social functions and may be caused in part by top-down processing.

5 . 主な発表論文等

1. HAO Q., ORA H., OGAWA K., AMANO S., MIYAKE Y. Modulation of Self-recognition by Interpersonal Synchronization. IMRF 2018. Canada Toronto. (peer review)

2. Qiao HAO, Hiroki ORA, Kenichiro OGAWA, Shunichi AMANO, Yoshihiro MIYAKE. The effect of interpersonal synchronization on the self-agency and self-ownership. ICME 2018. Japan Shimane. (peer review)

〔雑誌論文〕(計 件)

〔学会発表〕(計 件)

〔図書〕(計 件)

〔産業財産権〕

出願状況 (計 件)

名称 :

発明者 :

権利者 :

種類 :

番号 :

出願年 :

国内外の別 :

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発明者 :

権利者 :

種類 :

番号 :

取得年 :

国内外の別 :

〔その他〕

ホームページ等

6 . 研究組織

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所属研究機関名 :

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職名 :

研究者番号 (8 桁):

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