

## 【Grant-in-Aid for Scientific Research(S)】

Humanities and Social Sciences (Social sciences)



### Title of Project : A Twin Study on Sociability and Mental Health: A Bridge between Genes and Brain Activities

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Research Area : behavioral genetics, psychology, brain science, genomics

Keyword : twin, genetics, environment,

#### 【Purpose and Background of the Research】

At the coming of the dawn of a behavioral neurogenomics era, it has been becoming rapidly possible to clarify the mechanism in which how genes and behavior are connected. This can be realized with the integration work of traditional behavioral genetics, recent advances of brain sciences, and molecular genetics.

The purpose of this study is to clarify how sociability, mental health, and related psychological traits are being developed through interactive processes of genes and environment via neurological structures and functions by means of two large-scale twin cohort analyses (childhood, and young adulthood).

#### 【Research Methods】

Participants: 1500 pairs of childhood twin cohort (12mo to five yrs old) and 1500 pairs of adolescence/ adult twin cohort(20 to 35 yrs old). New twin families will be recruited in addition to the existing participants. These two cohorts will be longitudinally investigated as the figure below shows.

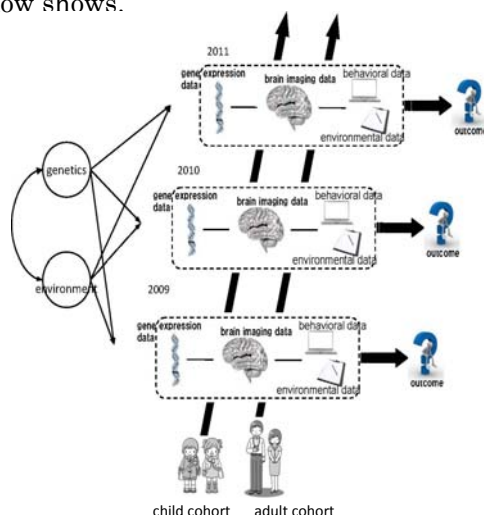


Figure Research structure of this study

Procedures:

- (1) questionnaire studies by mail and web
- (2) individually administered behavioral studies

- at home and in campus
- (3) brain structure/function studies by NIRS and MRI
- (4) molecular genetic studies by whole genome wide SNP scan

#### 【Expected Research Achievements and Scientific Significance】

Genetic and environmental influences on adaptive social behavior, mental health, and learning abilities will be clarified. We focus specifically on “gene-environment interaction” in which genetic effects are manifested differently in different environmental situations, and “gene-environment correlation” in which genes are selected by and/or select specific environmental situations. Brain structure and functioning as well as responsible genes that relate to gene-environment interplays will be specified.

These expected findings will clarify specific causalities from environmental changes in families and societies via genetic expression to neuro-physiological outcomes, and will suggest what kinds of educational, clinical and social intervention bring to bear what kinds of behavioral results.

These findings can provide scientific evidence and basic information to construct a society in which a range of people with diverse genetic dispositions live healthy, adaptive, and creative lives.

#### 【Publications Relevant to the Project】

- Ando J, Nonaka K, Ozaki K, Sato N, Fujisawa K, Suzuki K, Yamagata S, Takahashi Y, Nakajima R, Kato N, & Ooki S. The Tokyo Twin Cohort Project: Overview and Initial Findings. 2006. *Twin Research and Human Genetics*, 9: 817-826
- Shikishima C, Ando J, Ono Y, Toda T, & Yoshimura K. Registry of adolescent and young adult twins in the Tokyo area. 2006. *Twin Research and Human Genetics*, 9: 811-816

【Term of Project】 FY2009-2011

【Budget Allocation】 163,300Thousand Yen

#### 【Homepage Address and Other Contact Information】

<http://abelard.flet.keio.ac.jp/kts/>

<http://www.totcop.jp/>

<http://www.futago-labo.net/index.html>

<http://www.karc.keio.ac.jp/centers.html>