Project number 73

Neural correlates of 'Need for Cognition' in association with social cognition

［1］**Research group**
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Expenditure report of research funds :
Subject's honorarium 14,2000 YEN
Consumables 8,000 YEN

［2］**Research setup**

Cognitive activity plays an essential role in successful 'Smart-Aging' and has also been identified as a mediating factor in longevity (Bavishi et al., 2016). Although most cognitive functions decline in late adulthood, the intrinsic motivation to engage in cognitive activity appears to remain relatively stable across the adult lifespan (Soublet & Salthouse, 2017). The intrinsic motivation for cognitive activity can be measured by Need for Cognition (NfC), which is a relatively stable, situation invariant, social-cognitive personality trait, predicting the intrinsic pleasure of engaging in challenging intellectual activity (Cacioppo and Petty, 1982; Cacioppo et al., 1996). People with high NfC are more likely to seek out information to make sense of conflicting situations, whereas low NfC people are likely to rely on others' opinions (Cacioppo et al., 1996).

As one approach for better psychological well-being, maintaining connections with society is crucial in later life. Multiple types of information processing (e.g., verbal and non-verbal social cues) are required for successful social interactions, also featured in people high in NfC. Although NfC represents the ability for multiple information seeking, no study has investigated the direct associations of NfC and social cognitions. Therefore, the present joint research aims to test whether higher NfC individuals also prefer to engage in effortful thinking in socially challenging contexts (Figure 1).

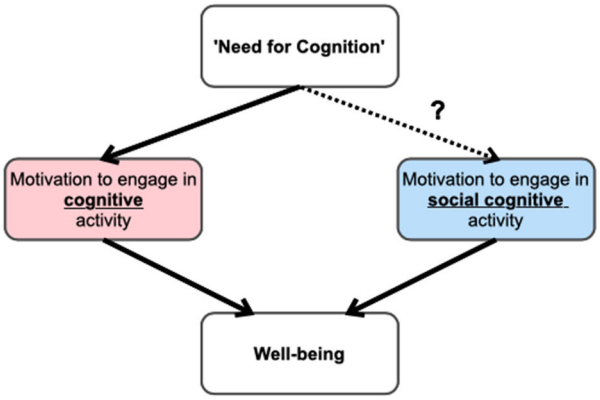

Figure 1. Concept of the study.

For this, we separated conditions into 'Non-social' and 'Social' cognitively challenging contexts, to see whether neural pathway during social cognitive thinking is associated with NfC trait in relation to psychological well-being. The present research aimed to create scenarios in each condition, and to validate the feasibility to apply for the functional brain imaging task in the future fMRI study. We setup the present study containing three phases: (1) develop the scenarios, (2) validate the scenarios, and (3) conduct behavioural experiment (Table 1).

Table 1. Descriptions of Study Phases.

Study Phase	Descriptions
Phase 1	Create stimulus scenarios of cognitive and socially challenging situations.
Phase 2	Validate the scenarios by having participants rate their difficulties across conditions to select 40 scenarios in total.
Phase 3	Investigate the behavioural relationships of motivations for cognitive and social engagement by having participants rate their willingness to engage in the situations described in the scenarios.

To determine the details of the present joint research, text-based discussions (e.g., emails) were made on regular basis, and online meetings were held bimonthly from June to March, with host researcher at IDAC.

［3］Research outcomes

（3－1）Results

This year, since no previous studies have found to examine our research question, we focused on the development of the stimuli, and completed Phase 1 of this project. We collected ideas of both 'social' and 'non-social' cognitively challenging situations from participants' past experiences which they enjoyed thinking by leading to solutions with such situations. The survey platform was created using Qualtrics (https://www.qualtrics.com), a web-based software tool to build and distribute survey for online data collection. Two hundred participants aged 20 to 70 years were recruited online through Lancers outsourcing website (https://www.lancers.jp). After screening out unrelated responses and combined overlapping situations, the length and the description of the situations were controlled and edited into short scenarios (Figure 2).

'Non-social' cognitively challenging scenario:

The ice maker in my refrigerator was broken. It has been especially hot this summer which I urgently need to repair as soon as possible. However, we have exceeded our budget for this month and hoping to repair by my self. How would I solve this matter?

'Social' cognitively challenging scenario:

I'm finally taking out my girlfriend for the first time. As we've only known each other for few months, I'm not very certain of what she likes and what she doesn't. However, because it's our first date, I'd like to escort her perfectly to impress her. How would I solve this matter?

Figure 2. Examples of stimulus scenarios.

（3－2）Future perspectives

In addition to completing Phase 3 of this project, we aim to further investigate the cultural differences that might have impact the motivation of social engagement in relation to NfC. We also aim to further investigate the neural associations of how desire for engaging in effortful thinking associated with the rewarding system and social interactions with their individual difference using fMRI. If the present study provides the link for NfC and social cognition, we will have made a significant advance for future research to untangle the motivations of social involvement. As social interactions are considered critical factors for a better quality of life and longevity, we expect our outcomes to benefit society by possibly increasing well-being and life expectancies.

［4］List of research achievements

We have not presented or published the outcome of Year 1.