

Theoretical re-construction of social facilitation and inhibition  
-Going beyond Zajonc' s drive theory-

Abstract

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## Abstract

In everyday life, people may change their behaviors when others are present compared to when they are alone. For example, imagine you are preparing for an exam among other customers in a café. In such a situation, you may feel that you are working more efficiently than if you were alone at home. That people tend to perform tasks more (or less) efficiently with other individuals present is a phenomenon known as social facilitation (or inhibition) (Allport, 1924).

Social facilitation and inhibition have been studied in several kinds of animals that include humans, other mammals, birds, and insects. Researchers have classified social facilitation and inhibition into two subcategories based on the context of other individuals' presence: for the "co-action effect" and "audience effect," task performance is facilitated by concurrent action of other individuals and the presence of an evaluative observer, respectively.

The mechanism of social facilitation has mainly been explained in terms of Zajonc's drive theory (Zajonc, 1965). Because this theory was based on only observed "behavior" as output, but NOT on neural mechanisms that underlie the behavior, it could not explain the results of previous studies on social facilitation and inhibition with unified framework. The neural underpinnings of social facilitation and inhibition are unclear. Thus, the goal of this dissertation is to re-examine the drive theory to clarify the neural mechanisms and construct a novel theory of social facilitation and inhibition.

This dissertation's structure is as follows:

In Volume 1 (Chapters 1-3), we focus on the previous works and theories in social facilitation and inhibition. In Chapter 1, the author described the early research of social facilitation and inhibition that served as the basis of drive theory. In Chapters 2 and 3, the author reviewed the theories of social facilitation and inhibition, especially "drive theory," "evaluative-apprehension theory," and "distraction-conflict theory." The three main problems of these theories and ways to solve them were also discussed.

The focus of Volume 2 (Chapters 4-5) is the relationships between arousal and social facilitation. "Arousal" is a key factor of the process of occurrence in all theories of social facilitation and inhibition; however, it was unclear whether an increase in arousal level due to only the perception of others produces social facilitation (Experiment 1 in Chapter 4). The results showed that misattribution of a causal association between the increases in arousal level and social perception

could be a potential induction mechanism for social facilitation. In Chapter 5, the need for further examination of the relationships between arousal and social perception was discussed.

The focus of Volume 3 (Chapter 6) is direct comparison on social facilitation phenomenon between different species. The drive theory postulated that humans, mammals, birds, and insects were had equivalent behaviors to explain the process of occurrence in social facilitation and inhibition. However, it was unclear whether the social facilitation in humans and those in rodents occur by same reason. We constructed new tasks to compare social facilitation in human and rats with ensuring the same constructive concepts in each species (Experiment 2 in Chapter 6). The results showed that both humans and rats exhibit the audience effect in the experimental task having same constructive concepts; therefore, it is considered that the social facilitation in rats and human, at least in our task, might derive from similar mechanisms.

The focus of Volume 4 (Chapters 7–8) is the neural mechanisms of social facilitation. The neural bases of social facilitation and inhibition had never been examined. The author, therefore, examined by brain lesion studies of rats whether the audience and co-action effects were due to activity in the same areas of the brain, especially anterior cingulate cortex (Experiment 3 in Chapter 7). The results showed that the effect of lesion in anterior cingulate cortex was presented only in the context of “audience effect” but NOT in that of “co-action effect”. In Chapter 8, the author suggested that the audience effect might be related to the “theory of mind” derived from the neural processing that involves the anterior cingulate cortex. Conversely, the co-action effect may be associated with the mirror neuron system because it involves the process of observation of other individuals’ motions.

Volume 5 (Chapter 9) covers the developing theory of social facilitation and inhibition. The author suggests a new theory of process underlying social facilitation and inhibition based on the results of Experiments 1, 2, and 3, and discusses future studies that will further clarify social facilitation and inhibition.