



# Characteristics of motivation and their impacts on the functional outcomes in patients with schizophrenia

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## Abstract

**Background:** Deficits of motivation have been considered to be a core feature of schizophrenia, and recent studies have begun to reveal the biological and psychological characteristics and mechanisms underlying the deficits in motivation in schizophrenia patients. The aims of the present study were to investigate the characteristics of motivation in schizophrenia patients using the General Causality Orientations Scale (GCOS), and the impacts of motivational orientations on the functional outcomes in schizophrenia patients.

**Methods:** A total of 53 outpatients with schizophrenia and 38 healthy controls were recruited for this study. The GCOS was used to assess individual tendencies in respect of three different motivational orientations: the autonomy, controlled, and impersonal orientations, corresponding to intrinsic motivation, extrinsic motivation, and amotivation, respectively. The cognitive functioning, psychiatric symptoms, social functioning, and quality of life of the subjects were also assessed.

**Results:** The score for autonomy orientation was significantly lower in the patient group than that in the control group, while no significant differences were found between the two groups in respect of the scores for the other two orientations. The autonomy orientation was associated with various clinical variables, and regression analysis identified as one of the variables with the highest predictive accuracy for social functioning.

**Conclusions:** Intrinsic motivation measured by the GCOS in schizophrenia patients was significantly lower than that in healthy controls. The deficits of intrinsic motivation were broadly associated with the clinical features and were a determinant of social functioning. Development of treatments for enhancing intrinsic motivation would be essential for functional recovery in schizophrenia patients.

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## 1. Introduction

Deficits of motivation have been considered as a central feature of schizophrenia since early times. They are frequently considered as a part of the negative symptom clusters. Recent studies have begun to reveal the biological and psychological characteristics and mechanisms underlying the deficits in motivation in schizophrenia patients [1–7]. The Self-Determination Theory (SDT) provides a broad framework to examine human motivation and personality. In theory, it is hypothesized that motivated behavior in humans is affected by environmental factors and personality

tendencies, and comprises three components: intrinsic motivation, extrinsic motivation, and amotivation (disconnection-disengagement) [8,9]. Intrinsic motivation, which drives individuals to set goals and engage in behaviors with inherent interest, has recently drawn much attention in the field of psychiatry, although the framework for intrinsic motivation was first developed in other fields such as education, sports, and healthcare. As compared with healthy controls, patients with schizophrenia exhibit lower levels of intrinsically motivated behavior [10,11]. It has also been demonstrated using a quality-of-life scale that intrinsic motivation is associated with cognitive and psychosocial functioning in schizophrenic patients [12,13]. Therefore, under the present circumstances where medications may improve only the psychotic symptoms and have no effect on the functioning of the individuals, intrinsic motivation is also regarded as an important target for successful rehabilitation to

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improve the functional outcomes in schizophrenia patients [14]. In addition, several studies revealed that intrinsic motivation would play a vital role in predicting functional outcome [15,16]. On the other hand, extrinsic motivation refers to behaviors driven by external forces, such as rewards and punishment, and the implications of extrinsically motivated behavior are still controversial in schizophrenia [17].

The General Causality Orientations Scale (GCOS) was developed on the basis of the Causality Orientation Theory, which was one component of the SDT, in order to assess the profile of motivation [18]. The GCOS is used to measure three personality tendencies: the autonomy orientation, the control orientation, and the impersonal orientation, which correspond to intrinsic motivation, extrinsic motivation, and amotivation, respectively. The GCOS is useful for practical evaluation one's general motivational orientations. A recent study used the GCOS to assess motivation in patients with first-episode psychosis, and revealed that all the orientations were significantly different in the patients as compared to the control subjects, although one of the limitations of the study was that it was unclear whether the demographic data had been matched between the two groups [19]. Another recent study on schizophrenia adopted a modified version of the GCOS and revealed that schizophrenic patients had lower autonomy orientation and higher impersonal/amotivated orientation as compared to healthy controls, and the motivational orientations were partially correlated with psychosocial functioning, but not with the psychiatric symptoms in schizophrenia patients [20].

To the best of our knowledge, there are no studies that have investigated the relationships of these motivational orientations with the broad clinical features, including those related to cognitive function, psychiatric symptoms, and social functioning in patients with schizophrenia. The aims of the present study were to investigate (1) the characteristics of motivation in schizophrenic patients as compared with those in healthy controls using the GCOS; (2) the relationships between the motivational orientations and the clinical features, and (3) the contribution of motivational orientations to the functional outcomes in schizophrenia patients.

## 2. Methods

### 2.1. Participants

A total of 53 outpatients with schizophrenia were recruited from the Toho University Omori Medical Center, Tokyo; in addition, 38 healthy controls were volunteers recruited from the community around Tokyo. The patients were diagnosed by trained psychiatrists based on the DSM-IV criteria [21]. The mean age of the patients was 30.6 years, and the mean number of years of formal education was 14.8 years. The mean duration of illness was 95.7 months, and the mean age at onset was 22.0 years old. The mean duration of untreated psychosis (DUP) was 10.5 months. No significant differences in the gender, age,

or years of education were observed between the two groups. The demographic and clinical characteristics of both groups are shown in Table 1. None of the subjects had a history of alcoholism, drug abuse or serious neurological illness. The institutional review board approved the protocol for the study. The study was carried out in accordance with the latest version of the Declaration of Helsinki. After providing the subjects with a complete description of the study, written informed consent was obtained from every subject.

### 2.2. Measures

#### 2.2.1. Motivation

The GCOS was used to assess individuals' tendencies in respect of three different motivation orientations: autonomy, controlled, and impersonal orientations, and these three orientations are conceptualized as intrinsic motivation, extrinsic motivation, and amotivation, respectively. An individual who is highly autonomously oriented is referred to as having a strong tendency to be intrinsically motivated. The 12-vignette version of the GCOS in Japanese [18,22] was used in the present study. For each vignette, three statements corresponding to the three orientations were presented. For example, "You have been invited to a large party where you know very few people. As you look forward to the evening, you would likely expect that: a) you will try to fit in with whatever is happening in order to have a good time and not look bad; b) you will find some people with whom you can relate; c) you will probably feel somewhat isolated and unnoticed." Subjects were asked to rate their likelihood of approval for the statements on a Likert scale from 1 to 7. The highest score for each orientation was 84 and the lowest was 12; higher scores indicated a higher propensity to be oriented in each of the orientations. The validity and reliability of the Japanese version of the GCOS have been established elsewhere [22]. Three orientations of the Japanese version showed acceptable internal consistency: the autonomy orientation ( $\alpha = 0.76$ ), the controlled orientation ( $\alpha = 0.65$ ), and the impersonal orientation ( $\alpha = 0.65$ ). These orientations also showed good test-retest reliability: the autonomy orientation ( $\alpha = 0.73$ ), the controlled orientation ( $\alpha = 0.72$ ), and the impersonal orientation ( $\alpha =$

Table 1

Demographic and clinical characteristics of the subjects with schizophrenia and healthy controls.

	Schizophrenia	Controls
N (male/female)	53 (29/24)	38 (20/18)
Age (years)	31.1 (5.1)	30.6 (6.6)
Years of education	14.8 (1.5)	15.1 (1.7)
Age at onset (years)	22.0 (6.4)	
Duration of illness (months)	97.0 (73.4)	
Duration of untreated psychosis (months)	10.5 (16.4)	
Antipsychotic medication dose (CPZ equiv.)	408.9 (330.8)	

Values are numbers or means (standard deviation in parenthesis). CPZ: chlorpromazine.

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