Part I: Introduction

Chapter 1

Outline of the Thesis and Concepts

1.1 Outline of the thesis

This thesis is concerned with the relationship between cognitive impairment and everyday functioning in schizophrenia. More specifically, the thesis examines (1) the relationship between deficits in social cognition and performance in daily life and (2) the extent to which everyday functioning can be improved by cognitive rehabilitation. The thesis consists of four parts. Part I is an introduction and encompasses two chapters. The first chapter covers the outline of the thesis and key concepts of the study are discussed. In Chapter 2, the literature on cognitive functioning in schizophrenia is reviewed and a model based on mental schemata theory is proposed as a theoretical framework to describe the interaction between cognitive impairment and the functional consequences of impairments, framed in terms of activity limitations and restrictions on participation in everyday life situations.

Social cognition in schizophrenia is the focus of the second part of the thesis, which consists of three chapters. Chapter 3 provides a review of the literature on social cognition in schizophrenia, including discussion of the neurobiology of social cognition and future directions for research. In the following two Chapters, two experimental studies on social cognition in schizophrenia are presented. The first study, presented in Chapter 4, examines the perception of emotional prosody in schizophrenia. Moreover, the relationship between prosody perception and general cognitive abilities is examined. In Chapter 5, the relationship between social cognition (measured as a multidimensional construct) with activities and participation in everyday life is examined. The aim of this study was to determine whether performance on psychometric tests of social cognition predicts scores on measures of everyday functioning in individuals with schizophrenia.

Part three of the thesis concerns the contribution that cognitive rehabilitation
interventions may make to improving everyday functioning in schizophrenia.

In the first Chapter of this part (Chapter 6) an introduction to cognitive rehabilitation in schizophrenia is provided. Thereafter, two studies of cognitive rehabilitation in schizophrenia are presented. Both address the efficacy of a cognitive prosthesis that is used to prompt patients to carry out their daily activities. The cognitive prosthesis involves the use of SMS-text messages sent to a mobile telephone. In Chapter 7 the result of a pilot study of the intervention are discussed. In Chapter 8 a controlled trial of the intervention is presented.

In the final part of the thesis (Chapter 9) I will discuss the results of the studies in the preceding Chapter and their implications for the treatment of schizophrenia.

1.2 Concepts

1.2.1 Schizophrenia

Schizophrenia is a severe and chronic psychiatric condition with a wide range of possible symptoms. No single symptom is pathognomonic for the disease. The disease affects a variety of aspects of behaviour, thinking, and emotion. The term schizophrenia stems from the Greek language and includes the words “schizein” (to split) and “phren” (mind). The term was coined by Eugen Bleuler in 1911. His description of schizophrenia is very broad and also encompasses schizo-affective disorders, pseudo-neurotic schizophrenia, schizophrenia simplex and latent schizophrenia (Van den Bosch & Kahn, 1995).

Before Bleuler, the disease was referred to as dementia praecox (Kraepelin, 1896). According to Kraepelin, schizophrenia is a neurodegenerative disorder. This view has become obsolete, since the prognosis is better than he originally stated and is therefore not compatible with an underlying neurodegenerative process. Since schizophrenia was first described, there has been considerable debate on its exact diagnostic criteria. Several attempts have been made to define the disease in a reliable way. International consensus on circumscribed criteria for diagnosing schizophrenia was not reached until 1980, when the DSM III was published. Before publication of the DSM III, delusions and hallucinations were not even included as a requirement for the diagnosis in some sets of criteria (Van den Bosch & Kahn, 1995). In the revised versions of the DSM since 1980, no significant changes in the diagnostic criteria of schizophrenia have been made. Today, the criteria of the DSM-IV-TR are the most widely used to diagnose schizophrenia in the Netherlands. DSM IV-TR Diagnostic criteria according to DSM IV-TR criteria are shown in Table 1.2.
### Diagnostic criteria for Schizophrenia

A. **Characteristic symptoms:** Two (or more) of the following, each present for a significant portion of time during a 1-month period (or less if successfully treated):

1. delusion
2. hallucinations
3. disorganized speech (e.g., frequent derailment or incoherence)
4. grossly disorganized or catatonic behaviour
5. negative symptoms, i.e., affective flattening, alogia, or avolition

**Note:** Only one Criterion A symptom is required if delusions are bizarre or hallucinations consist of a voice keeping up a running commentary on the person’s behaviour or thoughts, or two or more voices conversing with each other.

B. **Social/occupational dysfunction:** For a significant portion of the time since the onset of the disturbance, one or more major areas of functioning such as work, interpersonal relations, or self-care are markedly below the level achieved prior to the onset (or when the onset is in childhood or adolescence, failure to achieve expected level of interpersonal, academic, or occupational achievement).

C. **Duration:** Continuous signs of the disturbance persist for at least 6 months. This 6-month period must include at least 1 month of symptoms (or less if successfully treated) that meet Criterion A (i.e., active-phase symptoms) and may include periods of prodromal or residual symptoms. During these prodromal or residual periods, the signs of the disturbance may be manifested by only negative symptoms or two or more symptoms listed in Criterion A present in an attenuated form (e.g., odd beliefs, unusual perceptual experiences).

D. **Schizoaffective and Mood Disorder exclusion:** Schizoaffective Disorder and Mood Disorder With Psychotic Features have been ruled out because either (1) no Major Depressive, Manic, or Mixed Episodes have occurred concurrently with the active-phase symptoms; or (2) if mood episodes have occurred during active-phase symptoms, their total duration has been brief relative to the duration of the active and residual periods.

E. **Substance/general medical condition exclusion:** The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition.

F. **Relationship to a Pervasive Developmental disorder:** If there is a history of Autistic Disorder or another Pervasive Developmental Disorder, the additional diagnosis of Schizophrenia is made only if prominent delusions or hallucinations are also present for at least a month (or less if successfully treated).

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The life-time prevalence of schizophrenia is about 1% (Evers & Ament, 1995), while the incidence is about 0.2 per thousand inhabitants in the age category of 15 to 45 (Eaton et al., 1995). Schizophrenia typically develops in adolescence and early adulthood. A study in the Netherlands on the course of schizophrenia of 82 first
contact cases over 15 years (Wiersma et al., 1998) shows a complete remission in 12% of the patients after one psychotic episode, while 15% of the patients showed a full remission after two or more psychotic episodes. Other patients had one or more psychotic episodes followed by partial remission (17%) or a negative syndrome (33%). Eleven percent of the patients in the study were psychotic chronically and in 12% the course of the disease was unknown. In addition, suicide rate during the course of the study was 11%. The study also showed that the persistence of negative symptoms or chronic psychosis increased with the number of psychotic episodes.

**1.2.2 International Classification of Functioning, Disability and Health**  
In this thesis the terminology of the International Classification of Functioning, Disability and Health (ICF, 2001) is used as a framework for classifying the functioning of patients and as a means of describing the nature of rehabilitation interventions. The key principles of the ICF system are therefore discussed in the following section.

ICF is a conceptual framework proposed by the World Health Organisation for measuring Health and Disability at individual and population levels, and was formally known as the International Classification of Impairment, Disabilities and Handicaps (ICIDH). The aim of ICF is to describe an individual’s functioning in a standardised way, to promote consistency in use of health terminology. The framework encompasses two levels of functioning: functioning of the body and activities and participation.

The body part encompasses two domains: functions of body systems (e.g. cognitive functioning, sensory functioning, perception etc.) and body structures (anatomical parts of the body). A negative change in body functioning in either domain is referred to as impairment.

The second level encompasses activities and participation. Activities refer to a person’s capacity to do basic or complex actions. Examples of activities are self-care, grooming, doing a neuropsychological test, shopping and decision making. In ICF a negative change in ability to perform activities is called an activity limitation (what would previously have been referred to as a disability). Participation is a person’s involvement in society, for example having a job, participating in leisure activities, living independently etc. Problems in participation are referred to as participation restrictions (and would previously referred to as a handicap). Although these different terms are used, the ICF system does not formally separate them and in fact the two concepts are combined together. However, under the broad heading of Activity and Participation there are nine domains described as covering the ‘full range of life areas’ (ICF introduction, page 14), including learning and applying knowledge; general
tasks and demands; communication; mobility; self-care; domestic life; interpersonal interactions and relationships; major life areas (including education, work and economic life); and community, social and civic life. Activities and participation are described in terms of two qualifiers: performance, or the actual level of functioning of an individual in his current context, and capacity, which refers to the highest possible level of functioning of an individual in a given domain.

In addition to classifying levels of functioning, ICF also includes information on ‘Contextual Factors’. Contextual factors are divided into two categories: environmental and personal factors. Contextual factors interact with each of the two broad levels of functioning of ICF. Environmental factors are an individual’s physical, social, and attitudinal environment. ICF distinguishes five domains of environmental factors: products and technology; natural environment and human made changes to environment; support and relationships; attitudes; and services, systems and policies. Positive aspects of the context are referred to as facilitators, while negative aspects are called barriers.

Personal factors are not currently classified in ICF. This category addresses characteristics of an individual that do not fall into the domains of body functioning or activities and participation, for example age, gender and social status.