

EMOTION PROCESSES IN SCHIZOPHRENIA: IN RELATION WITH  
SYMPTOMATOLOGY AND DURATION OF ILLNESS

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## **ABSTRACT**

### **EMOTION PROCESSES IN SCHIZOPHRENIA: IN RELATION WITH SYMPTOMATOLOGY AND DURATION OF ILLNESS**

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The purpose of the present study was to examine the effects of positive and negative symptoms, and duration of illness on emotion processes; ability to understand emotion related cues, experience of emotion, and expression of emotion. A total of 46 schizophrenia patients from Ankara Oncology Hospital Psychiatry Clinic; 23 of them were diagnosed with schizophrenia for at least 10 years, and 23 of them were diagnosed for less than 10 years, participated in the study. Besides, a total of 23 non-clinical subjects; which were similar to the clinical group in terms of educational information, participated to the study. A video-clip which consists of scenes that elicited four types of emotions (fear, disgust, sadness, happiness) was presented to the participants. Understanding of emotion related cues and the experienced emotion were rated through self-report. Facial expressions of the participants were rated through their recorded faces by three psychologists, who were specifically trained for emotional facial expression rating. Symptomatology was assessed by Positive and Negative Symptom Scale (PANSS), and Calgary Depression Scale for schizophrenia patients. Presence of any psychopathology of healthy group was measured through Brief Symptom Inventory. Multivariate Analysis of Variance (MANOVA) revealed that chronic patients presented more understanding of context impairments than acute patients and non-clinical group. In addition to these findings, positive symptoms assessed by PANSS were found to be positively correlated with the understanding context impairment. Therefore, It was suggested that positive symptoms, such as hallucinations and delusions interfere with understanding context task. The results were discussed in the light of the

literature and clinical and research implications of the study presented. Finally, necessity of using neurological, biological and cognitive assessment methods for further studies was suggested in order to understand deficits in emotional processes.

Keywords: Schizophrenia, Emotion, Positive Symptoms, Negative Symptoms, Duration of Illness

**ÖZ**  
**ŞİZOFRENİ HASTALARINDA DUYGU SÜREÇLERİNİN SEMPTOMLAR VE  
HASTALIK SÜRESİ İLE İLİŞKİSİ**

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Bu çalışmanın amacı şizofreni hastalarının duygu süreçleriyle; algılama, hissetme, ifade etme, hastalığın pozitif ve negatif semptomları, ve hastalık süresi arasındaki ilişkiyi incelemektir. Çalışmaya, Ankara Onkoloji Hastanesi Psikiyatri Kliniğinde tedavi görmüş olan 46 şizofreni hastası katılmıştır. Hastaların 23'ü on yıldan daha uzun süredir şizofreni tanısı almış olup kronik hasta olarak değerlendirilmektedir. Diğer 23 hastanın tanı süresi ise 1 ile 10 yıl arasındadır. Aynı zamanda, eğitim düzeyleri klinik gruptan farklı olmayan 23 sağlıklı katılımcı araştırmaya dahil edilmiştir. Araştırmada, katılımcıların duygu deneyimlemelerini (korku, iğrenme, üzüntü, mutluluk) sağlamak amacıyla hazırlanmış dört sahne içeren bir kısa film kullanılmıştır. Katılımcıların duygu algılama ve hissetme süreçlerine ilişkin bilgi hastaların kendi ifadeleri dikkate alınarak kodlanmıştır. Duygu ifade becerileri ise, bu çalışma kapsamında duygu ifade kodlama için eğitilmiş üç psikolog tarafından değerlendirilmiştir. Şizofreni hastalarında semptom tespiti için Pozitif ve Negatif Belirtiler Ölçeği ve Calgary Depresyon ölçeği kullanılmıştır. Kontrol grubunun herhangi bir psikopatolojik sorun yaşamadığının tespiti için ise Kısa Semptom Envanteri (KSE) uygulanmış olup; herhangi bir alttestten

kesme puanı üstü alan katılımcılar çalışma dışı tutulmuştur. MANOVA sonuçları 10 yıldan daha uzun süredir şizofreni hastası olan grubun duygu algılamada , akut hastalardan ve kontrol grubundan daha fazla hata yaptığını ortaya çıkarmıştır. Aynı zamanda, şizofreninin pozitif semptomları ile duygu algılama süreçlerindeki hatalar arasında korelasyon bulunmuştur. Bu sonuç, halüsinasyon ve delüzyon gibi pozitif semptomların hastaların algılarında değişikliğe yol açtığı, bu sebeple duygu algılama süreçlerinin de bozulduğu şeklinde yorumlanmıştır. Tüm sonuçlar varolan literatür eşliğinde değerlendirilmiştir. Son olarak, duygu işlem süreçlerindeki bozulmaların daha iyi anlaşılması için, ileride yapılabilecek araştırmaların, nörolojik ve biyolojik tanı yöntemlerini kullanmalarının gerekliliği vurgulanmıştır.

**Anahtar Kelimeler:** Şizofreni, Duygulanım, Pozitif Semptom, Negative Semptom, Hastalık Süresi

To schizophrenia patients and their relatives



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*“Hope is the worst of evils, for it prolongs the torment of man”*

F. W. Nietzsche

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## **CHAPTER I**

### **INTRODUCTION**

Perception and expression of emotion are two crucial factors in our lives. In addition to the verbal expression of emotions, people usually express their emotions by facial cues. Ability of expression of emotion and understanding others' emotions through facial cues, affect our social interaction. Some groups have disadvantages in regard to expression and perception of emotion, such as schizophrenia patients.

Schizophrenia is characterized by positive symptoms; delusions, hallucinations, disorganized speech, disorganized or bizarre behavior and negative symptoms such as, affective flattening, alogia or avolition (American Psychiatric Association, APA, 2000).

Patients usually develop schizophrenia between the ages of 18-25 and two thirds of them are not able to be fully cured during their life (APA, 1994 cited in Saha, Chant, Welham, McGrath 2005). Social withdrawal is an important result of disorder and dysfunction in emotional processes; perception, experience and expression, are underlying reasons of social withdrawal.



First of all, etiology, epidemiology and symptomatology will be discussed shortly. Then emotion processes; perceiving emotional context, experience and expression emotion in relation with schizophrenia and the effect of duration and symptoms of schizophrenia on emotions will be held in the light of the literature. Afterwards, the aim of the present study will be presented.

## **1.1 Schizophrenia**

### **1.1.1 History of Schizophrenia**

Literature of schizophrenia extremely developed since its symptoms were first described as “dementia praecox” (dementia of the young) by Emil Kraepelin (1856-1926). Kraepelin's classification depended on early onset of disorder and poor prognosis (Stone, 2006). The term schizophrenia, meaning split mind, was introduced by Bleuler (cited in Stone, 2006) in the early 19<sup>th</sup> century. Ambivalence, disturbance of association, disturbance of affect, and a preference for fantasy over reality were described as fundamental symptoms and, delusions, hallucinations, movement disturbances, somatic symptoms, and manic and melancholic states were described as accessory symptoms (Bleuler, cited in Stone, 2006). This was the first symptom based categorization of schizophrenia. According to Bleuler, fundamental symptoms were present in all patients, whereas accessory symptoms were not present in all patients (cited in Walker, Kestler, Bollini, & Hochman, 2004).

In 1980s researchers started to differentiate symptoms of schizophrenia as positive and negative. Hallucinations, delusions and bizarre behaviors were evaluated as positive symptoms whereas decrement in behavioral effectiveness, such as blunted or flat affect, anhedonia, and lack of motivation were described as negative symptoms of schizophrenia (Howells, 1991).

### **1.1.2 Diagnostic criteria and subtypes of schizophrenia**

Today, most accepted description of schizophrenia has been made in Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revised (DSM IV-TR) by American Psychiatric Association (APA, 2000).

For diagnosing a patient as schizophrenia, the patient should have at least two of the following symptoms for at least one month and all other symptoms for at least six months; delusions, hallucinations, disorganized speech, disorganized or bizarre behavior and negative symptoms such as, affective flattening, alogia or avolition. If delusions are bizarre or hallucinations are about evaluating of people's behaviors and ideas or hallucinations are speeches of more than one people, then presence of only one of these symptoms is enough for diagnosis. In addition, presence of social and occupational dysfunction and lack of schizoaffective disorder, mood disorders with psychotic symptoms, lack of substance abuse and other possibilities should be excluded.

DSM IV text revised form defines six subcategories for schizophrenia. First one is paranoid type, characterized by presence of one or more delusion and hallucination and absence of disorganized speech, disorganized or bizarre behavior and flattened affect. Second subtype is named as “disorganized” and symptoms include disorganized speech, behavior and flattened affect but these are different than the symptoms of the catatonic subtype which is the third. Postural and/or movement abnormalities, mutism, or echolalia are the characteristics of this subtype. If patients’ symptoms do not meet the criteria of above categories, then diagnosis is made as undifferentiated type schizophrenia. Finally, the last subtype is residual type.

### **1.1.3 Epidemiology of Schizophrenia**

Prevalence of schizophrenia is found to be between .2 and .8 (Eaton, 1985). Another researcher found an annual incidence of schizophrenia between .1 and .7 (Eaton, 1991). Saha and colleagues (2005) reviewed 185 studies and stated that .4 point prevalence, .3 period prevalence, .4 lifetime prevalence and .7 life time morbid risk is present in general society.

It is suggested that patients usually experience a prodromal phase and develop symptoms such as social withdrawal, loss of interest in social life, unusual behavior and outbursts of anger before experiencing other symptoms of schizophrenia (Schultz, North, Shields, 2007; Lieberman, Stroup, & Perkins, 2006).

Substance abuse is a common comorbid problem of schizophrenia patients. It was found that schizophrenics with substance abuse have earlier first hospitalization and more number of hospitalizations (Lieberman, Stroup, Perkins, 2006).

Poor executive functioning was also reported as an important factor for prognosis. McGurk, Mueser, Walling, Harvey, Meltzer (2004) pointed out that need for support to gain independence and seek for outpatient services are higher for poor functioning schizophrenics than better executive functioning schizophrenics.

There is also evidence that schizophrenics have higher divorce rate and lower marital rate (Salokangas, Honkonen, Stengard, & Koivisto, 2001; Usall, Araya, Ochoa, Busquets, Gost, & Marquez, 2001; Hutchinson, Bhugra, Mallett, Burnett, Corridan, & Leff, 1999; Thara & Srinivasan, 1997). Cardiovascular diseases (Lean & Pajonk, 2003) and suicide (De Hert, McKenzie, & Peuskens, 2001; Lewis & Lieberman, 2000) are two common reasons of mortality in schizophrenia.

Dysfunction in premorbid social functioning (Keefe, Mohs, Silverman, Losonczy, Davidson, Horvath, & Davis, 1990), more severe negative symptoms (Keefe, Mohs, Losonczy, Davidson, Silverman, Horvath, & Davis, 1989) and formal thought disorders (Stephens, 1978; Keefe, et al.(1990), presence of delusional passivity phenomena, less association with affective symptomatology (Kilzieh, Wood, Erdmann, Raskind, & Tapp, 2003) more

extensive family history of psychosis (Keefe, Lobel, Mohs, Silverman, Harvey, Davidson, Losonczy, & Davis, 1991), long duration of untreated first episode psychosis (Altamura, Bassetti, Sassella, Salvadori, & Mundo, 2001), high expressed emotion of family and dysfunction in self care (Keefe, Frescka, Apter, Davidson, Macaluso, Hirschowitz, & Davis, 1996) are thought to be related factors of poor outcome in schizophrenia.

#### **1.1.4 Etiology of Schizophrenia**

Genetics, neurodevelopmental, neurological, prenatal, perinatal and neurochemical, and social factors were investigated as causes of schizophrenia (Lieberman, Stroup, & Perkins, 2006). Genetic and social factors will be discussed as etiological factors of schizophrenia.

Family studies, adoption studies and twin studies are the usual methods used to understand genetic epidemiology of schizophrenia (Lieberman, Stroup, & Perkins, 2006).

Family history of schizophrenia was found as an important factor for the development of schizophrenia (Sullivan, Owen, O'Donovan, & Freedman, 2006). Kendler (2000) conducted a meta-analytic study showing that risk of being schizophrenia is 10 times higher for the first degree relatives of schizophrenia patients than control groups who has no first degree schizophrenic relative. Kendler (2000) also reported that genetic relationship is a better predictor of the development of schizophrenia than adopted parent.

There are several genes which were empirically evaluated as a cause of schizophrenia (Owen, Williams, & O'Donovan, 2004;). The role dopamine d3 receptor gene in development of schizophrenia was empirically supported (Staddon, Arranz, Mancama, Perez-Nievas, Arrizabalaga, Anney, Buckland, Elkin, Osborne, Munro, Mata, & Kervin, 2005). However, results related role of other genes are contradictory (Sullivan, et al., 2006) .

Today, it is known that social factors are not sufficient for explaining schizophrenia, however, these factors play important role by interacting with genetic and neurological factors (Cantor-Graae, 2007). Diathesis stress model emphasize and analyze the interaction between social factors and, genetically, prenatal and pre-morbid vulnerability factors. It is suggested that vulnerable genetic basis in conjunction with the stressful life events explain the development of schizophrenia (Walker & Diforio, 1997).

Cantor-Grae (2007), in his review, reported that, some of the social risk factors such as migration and social exclusion interact with neurodevelopmental processes in the developmental course of schizophrenia.

Meta-analytic migrant studies support that long-term exposure to social defeat or experience of discrimination is related to the development of schizophrenia (Cantor-Grae & Selten 2005).Difference of prevalence of hallucinations and odd beliefs between ethnic-groups also support the

relationship between social factors and symptomatology and a support for diathesis-stress model (Johns, Nazroo, Bebbington, & Kuipers, 2002; Sharpley & Peters, 1999; Scott, Chant, Andrews, & McGrath, 2006).

Urban-birth and/or urban upbringing was also found to be related to psychotic symptoms. Krabbendam and Van Os (2005) found that prevalence of schizophrenia in urban areas is twice as much as in rural areas. Some studies suggest that urban effect is greater during upbringing due to exposure to discriminative factors (Pedersen & Mortensen, 2001) whereas other researchers found no relationship between urban upbringing and schizophrenia (Mcgrath, El-Saadi, Cardy, Chapple, Chant, & Mowry, 2001).

Diathesis stress model and role of social stressors are also empirically supported by animal studies (Morgan, Grant, Gage, Mach, Kaplan, Pringleau, Nader, Buchheimer, Ehrenkaufner, & Nader, 2002; Tidey & Miczek, 1996; Isovich, Engelmann, Landgraf, & Fuchs, 2001). Animals exposed to social isolation, social subordination and social stress showed higher dopaminergic activity. It is also found that rats exposed to social defeat stress had higher sensitivity to cocaine and amphetamine substances (Covington & Miczek, 2001) in similar to schizophrenia patients' increased sensitivity to these substances (Laruelle, Abi-Dargham, Gil, Kegeles, & Innis, 1999).

## **1.2 Emotion Processes**

“Emotions color virtually all aspects of our lives” (Adolphs, Damasio, 2001, p. 28). Emotions are directly related to how we perceive the events, how we interact with outer world and all our relations with other people and environment (Campos et al., 1994, cited in Oatley, Jenkins, 1996).

The debate on emotion terminology mostly occurs as a result of approaches understanding in a) what are emotion processes (Lazarus, 2001) and b) what is the chronological order of the processes (Schmidt-Atzert, 1987). According to behavioral approach emotions are mirror feelings of some complex bodily arousal. They suggested that perception of the event is followed by bodily changes and accordingly emotion occurs as a result of feeling of behavioral change (James, 1984). Behaviorists ignore the role of cognition (black box) and raise the importance of behavioral changes; physiological and/or expressions, as primary to emotion.

However, one of the most accepted chronological development theory of emotion was that, first people appraise the event, then evaluate the context which is followed by action readiness and end up with physiological change, expression and action (Frijda, 1986, cited in Oatley, Jenkins, 1996). This model is also similar to cognitive approach that evaluates emotion as a result of cognitive appraisal and evaluation of a significant event (Beck, 1976).



It is widely accepted that cognitive processes such as, evaluations, judgments, appraisals, and beliefs play crucial roles in development of emotions (Lewis, 2000; Lyons, 2000; Cornelius, 1996, cited in Smith, Kirby, 2001). Lyons (2000) also suggested that cognitions also have role in perception of environment and reactions to environment in which emotional event occurs. The role of cognitions in emotional processes investigated through social cognition theory. Social cognition theory suggested that perception of emotion, theory of mind and attributional styles have roles in processes of emotion and social dysfunctions.

Specific conditions were described for each basic emotion (sadness, disgust, anger, fear, happiness, and surprise) to be experienced. It was suggested that experience of sadness, requires an appraisal of permanent or temporary loss of people, object, moral value and/or a goal (Power, 2000). For disgust, Rozin and Fallon in 1987 (cited in Curtis & Brian, 2001) suggested that “the prospect of [oral] incorporation of an offensive object” is necessary for experiencing of disgust. Presence of an aversive event was suggested to primary condition of both anger and fear. The difference was mentioned as individuals processing of the event. It was suggested that if individual evaluate and respond with an aggression related tendency, then emotion of anger occurs, whereas if individual responds with escape related tendency then emotion of fear occurs (Berkowitz, 2000). Happiness is an emotion mentioned as positive was suggested to be a response to presence of an event which is appraised as consistent to personal goals. At last, surprise was described a reaction to presence of an unexpected event.

Ekman (2001) suggested that expressions of emotions are universal and all healthy people are able to express these emotions through facial expressions. He described specific facial muscle movements that represent emotions. He also suggested that individuals are capable of understanding others emotions through facial expressions. However, he mentioned that, people also have ability to express emotions that they do not experience since; individuals have the ability to fabricate some facial expressions of emotions. He also stated that there would be differences between experienced and expressed emotions due to inhibition ability of individuals (Ekman, 2001).

### **1.3 Impaired Emotion Processes in Schizophrenia**

It was suggested that schizophrenia patients have disabilities in recognition, experience and expression of emotions which result in non-effective social interaction (Aleman, Medford, & David, 2006). Disabilities would be; misinterpretation or misunderstanding of situation (Green, Waldron, & Coltheart, 2007), inappropriate feeling toward the situation (Kohler & Martin, 2006; Seok, An, Lee, Lee, Lee, Jeon, & Kim, 2006), inappropriate response and/or excessive feeling or lack of an emotion (Seok, et al., 2006).

Social cognitive theory suggested that schizophrenia patients have difficulties in perception of outer world, since they have problems in theory of mind, attributional styles and perception of facial emotions of others (Penn, Addington, & Pinkham, 2006). Emotion processes begins with perception of

outer world and attributions to perceived events(Arnold 1960, cited in Beck, 1976), therefore, it is so important to understand social cognitive deficits in schizophrenia.

### **1.3.1 Perception of Emotion Related Cues**

It was suggested that processing of emotion begin with evaluation of social and interpersonal cues (Ellis & Young, 1998). Successful perception and evaluation of these cues is related to social cognition ability (Penn, Ritchie, Francis, Combs, & Martin, 2002).

Social cognition refers to “the human ability and capacity to perceive the intentions and dispositions of others” (Brothers, 1990, p.28). Social cognition is considered to be a different cluster from neurocognitive functions such as; attention vigilance, early visual processing, executive functioning, sensory motor gating and verbal memory (Sergi, Rassovsky, Widmark, Reist, Erhart, Braff, Murder, & Green, 2007). However, it was supported that social cognition is related to the neurocognitive functions, social functionality and social behavior, such as experience and expression of emotion (Sergi et al, 2007). Social cognition deficits in schizophrenia were investigated through theory of mind and perception of emotion deficits and attributional style.

Theory of Mind (ToM), which is a dimension of social cognition, was described as the ability to infer the mental states of others and/or to make inferences about others intentions (Murphy, 2006). ToM is suggested to appear in early childhood (Leslie, 1987) and becoming stable throughout

aging. However, ToM ability was found to decrease in patients of autism, Asperger's syndrome and schizophrenia (Murphy, 2006).

There's considerable evidence that schizophrenic patients have deficits in terms of ToM (Frith & Corcoran, 1996; Corcoran, Mercer, & Frith, 1995). They were found having disabilities in ability to understand and interpret beliefs of others (Frith, 1994, cited in Frith & Corcoran, 1996). Therefore, they have a disadvantage in perception of others' social cues, which result in misunderstanding social context. Frith (1992, cited in Frith, Corcoran, 1996) suggested that patients with paranoid delusions and thought disorders have more difficulties in understanding and representing of others' mental states.

Uhlhaas, Philips, Schenkel, and Silverstein (2006) investigated ToM ability of schizophrenia patients in relationship with symptoms, duration of illness and context processing. They revealed that chronicity of illness, high scores on cognitive factor of PANSS and perceptual dysfunctions are related to more impairment in ToM ability.

Another aspect of social cognition is perception of emotion; ability to decode, recognize, identify and discriminate facial, verbal and postural emotional expressions of others (Green, Kern, Robertson, Sergi, & Kee, 2000). It requires ability of ones' understanding and comprehending emotional cues presented (Monkul, Green, Barrett, Robinson, Velligan, & Glahn, 2007). Appropriate emotion recognition, including successful evaluation of

contextual cues was found necessary in order to produce appropriate social responses (Adolphs, 2001).

It was suggested that healthy people have perception of emotion ability insignificant from culture (Ekman, Sorenson, & Friesen, 1969; Ekman & Friesen, 1971). However schizophrenia patients were found impaired in perception of emotion ability (Borod, Martin, Alpert, Brozgold, & Welkowitz, 1993; Bellack, Blanchard, & Mueser, 1996).

Deficits of perception of emotion (PoE) are usually measured through presenting pictures of facial expressions which was designed by Ekman and Friesen, in 1975. Subjects were assigned to identify and/or discriminate the emotions expressed. However, assessment of PoE by static facial expression pictures were criticized since in real world perception of emotion occurs with surrounding social cues related to emotion (Monkul et al., 2007).

PoE studies show that, schizophrenics have deficits in recognizing the facial affect of others (Addington & Addington, 1998; Feinberg, Rifkin, Schaffer, & Walker, 1986; Walker, McGuire, & Bettles, 1984; Dougherty, Bartlett, & Izard, 1974; Mueser, Doonan, Penn, Blanchard, Bellack, Nishith, & DeLeon, 1996). It was also revealed that schizophrenia patients perform consistently lower than normal controls in other perception of emotion tasks (Penn et al., 2006).

Kerr and Neale (1993) used facial and vocal emotion identification and emotion discrimination tests to examine whether perception of emotion is a specific deficit or depending on generalized poor performance. They found that schizophrenia patients' identification and discrimination scores were significantly worse than controls. They concluded that a generalized poor performance is the cause of poor emotion recognition. In similar, schizophrenia patients were also found impaired in recognition of emotional prosody, vocal cues of emotion expression that result in misunderstanding of emotional states of others (Hoekert, Kahn, Pijnenborg, & Aleman, 2007).

Sachs, Steger-Wuchse, Kryspin-Exner, Gur, & Katsching (2004) also reported that schizophrenia patients are worse than healthy subjects in terms of emotion recognition and emotion discrimination. In addition to these, significant correlation is found between emotion discrimination and abstraction flexibility, verbal memory and language processing. They concluded that PoE deficits are associated with cognitive deficits in schizophrenia.

A debate over emotion recognition deficit is its generality. Some authors support that emotion recognition deficits are common for all emotions (Novic, Daniel, & Perline, 1984; Heimberg, Gur, Erwin, Shtasel, & Gur, 1994). However, some studies showed that emotion recognition deficits are emotion specific (Mandal, Rai, 1987; Cramer, Weegman, & O'Neil, 1989). It was suggested that recognition deficit is more impaired for negative emotions

than positive ones. It was suggested that schizophrenia patients have more difficulty in recognizing and discriminating of expressions of anger and fear.

Proponents of emotion specific deficit theories claim that, deficit of emotion recognition is a result of social cognitive deterioration (Mandal, Pandey, & Prasad, 1998). It was suggested that schizophrenics avoid exposure to emotion eliciting stimuli, especially for negative emotions. Alternatively, generalized deficit theorists, assume that emotion recognition deficits are due to cognitive impairments which effect patients' emotion processing ability (Johnston, Devir, & Karayanadis, 2006).

Perception of Emotion dysfunction is considered as stable over time. Kee, Green, Mintz, & Brekke (2003) found that PoE deficits were stable over one year duration. It was also indicated that PoE deficits would not worsen even positive and negative symptoms gain increment (Penn, Addington, & Pinkham, 2006). However, Mueser, Doonan, Penn, Blanchard, Bellack, Nishith, & DeLeon (1996) found that chronicity of the illness is related to the perception of emotion deficits. By the way, absence of an acute schizophrenic control group was an important limitation of the study.

Some researchers point out cerebral activity as a cause of perception of emotion deficits in schizophrenia (George, Ketter, Gill, Haxby, Ungerleider, Herscovith, & Post, 1993; Morris, Friston, Buchel, Frith, Young, Calder, & Dolan, 1998). It was reported that current source density in frontal, temporal and central electrode sites are weaker for schizophrenia subjects (Streit,

Brinkmeyer, Wölwer, & Gaebel, 2003). Thus, they suggested that neurophysiological studies should be conducted to understand emotion perception deficits.

Cultural factors related to PoE deficits were also studied (Habel, Gur, Mandal, Salloum, Gur, & Schneider, 2000). Brekke, Nakagami, Kee, & Greenl (2005) compared three ethnic groups (Euro-American, African-American, and Latino), which did not significantly differ in education, global symptom level, days on anti-psychotic medication, prognosis, negative symptoms and global psycho-social functioning. They found that Latinos and African-Americans both scored lower than Caucasians in terms of perception of emotion. They suggested that PoE is affected by ethnicity and cultural mechanisms.

Scholten, Aleman, Montagne, & Kahn (2005) found that schizophrenic men perform worse than women in emotion perception tasks. This result is compatible with the hypothesis that healthy women outperform in emotion processing tasks than healthy man (Hall, 1984). Therefore, they suggested that studies measuring social impairments should consider gender issue.

Turetsky, Kohler, Indersmitten, Bhati, Charbonnier, and Gur (2007) indicated that affect recognition deficits are secondary results of faulty encoding of faces. They also suggested a link between abnormal face encoding and delusions.



In addition to the stability of perception of emotion deficits, some training programs were found feasible and effective in treatment of facial affect recognition deficits. Fromman, Streit, and Wölwer (2003) suggested that “The Training of Affect Recognition Program” is effective in training schizophrenia patients on facial affect recognition and application of training in -social life.

Patients in treatment with second generation antipsychotics (risperidone) were found significantly better performing in perception of emotion tasks, than patients with treatment of first generation antipsychotics such as, haloperidol (Williams, Loughland, Green, Harris, & Gordon, 2003; Kee, Kern, Marshall, & Green, 1998). Similarly, there is a growing body of evidences that indicate effectiveness of second generation antipsychotics in treatment of negative symptoms of schizophrenia (King, 1998). Second generation antipsychotics were found effective in treatment of blunted affect symptom of schizophrenia (Umbricht, & Kane, 1995). It was suggested that second generation antipsychotics result in less negative symptoms since use of these drugs result in less extrapyramidal side effects and less dysphoric affect than use of first generation antipsychotics (King, 1998). However, a recent study conducted by Kucharska-Pietura and Tylec (2008) presented contradictory results. They found that vocal and emotion perception impairments were not effected by the type of neuroleptic that patient use.

Attributional style is another important factor related to social cognition deficits in schizophrenia. Social attribution refers to the way how a person explains the causes of a negative or positive outcome. Attributional style was

found to be in relations with how people experience emotions. Especially, internal attributions of negative events and external attribution of positive events were found to be related to more negative emotional experiences. It was found that depressed patients make internal, stable, and global attributions of the negative events, whereas they prefer to make external attributions of the positive outcomes (Abramson, Seligman, Teasdale, 1978).

It was suggested that schizophrenic patients' attributions are much more different than depressed patients. Schizophrenia patients have much more self-serving bias than depressed patients. However, there is a lack of empirical support of self-serving bias. Garety and Freedman (1996), in their review, suggested that schizophrenics, with persecutory delusions, prefer to make external attributions of negative events more than controls, however they prefer to make less general self-serving bias.

### **1.3.2 Experience of Emotion in Schizophrenia**

In addition to recognition deficits, studies suggested that schizophrenics have problems in experience of emotion. Anhedonia, lack of experiencing pleasure is one of the emotional difficulties of schizophrenic patients experience (APA, 2000). Anhedonia was found to be related to less experience of positive affect and more experience of negative affect in schizophrenia (Blanchard, Mueser, & Bellack, 1998). However, there are also contradictory results suggesting no difference of experienced emotion between schizophrenic patients and healthy people (Kring, & Neale, 1996).

Burbridge and Barch (2007) revealed that schizophrenia patients report similar experiences of emotions with the control group: However, they revealed an emotion-specific effect that suggesting schizophrenia patients report less experiences arousal, in presence of negative stimuli when compared with the control group. They claimed that working memory is a moderator between physical anhedonia and subjective experience of emotional toward positive stimuli.

A recent study was conducted by Herbener Song, Khine, and Sweeney (2008), in order to investigate the differences in emotional experience between healthy and schizophrenic people. In the study participants were assigned to 131 images and were asked to report how each image made them feel. Physical and social anhedonia scales, PANSS, and Penn Emotion Acuity tests were also administered. They found no difference between two groups in terms of; self-reported emotion, emotion valence and elicited arousal. However, the results revealed that schizophrenic patients reported more social and physical anhedonia than healthy people even though the self-reported emotions were similar between groups. In addition to these, negative symptoms subscale of PANSS was found to be positively correlated with self-reported physical and social anhedonia.

There are methodological problems in working with experience of emotions of schizophrenia patients. First problem arises in using self-report measures of experienced emotions. Jaeger, Bitter, Czobor and Volavka (1990)

indicated that schizophrenia patients are impaired in labeling of self-experience of emotions.

Expression of emotion was found unrelated with experience of emotion in schizophrenia patients. Kring, Kerr, Smith, & Neale (1993) used film clips to elicit emotion in schizophrenia patients, since film clips were regarded as more realistic than using pictures and using scenes are found to be applicable method of emotion induction for psychotic patients (Berenbaum & Oltmanns, 1992, cited in Kring et al, 1993). They found that schizophrenics show less facial expression than healthy subjects however their self-report of experience of emotions are similar with healthy group. They claimed that blunted affect would be reason of discrepancy between experienced and expressed emotion. This result is supported by other researches (Aghevli, Blanchard, & Horan, 2003).

There is lack of neuroimaging studies to understand nature of experience of emotion impairments in schizophrenia (Kohler, Martin, 2006). One of the neuroimaging studies was conducted by Taylor, Liberzon, Decker, and Koeppel (2002). They found that patients report similar subjective experience of emotions with healthy people whereas; they differ in brain activation, measured by positron emission tomography.

### **1.3.3 Expression of Emotion of Schizophrenics**

Expression of emotion includes our facial and other verbal cues and vocal instruments that we use to express our emotional state (Ekman, Friesen,

1975). Facial expression of emotion is considered as an important factor of interpersonal communication since Darwin (Kohler, & Martin, 2006) and suggested to be important in development and regulation of interpersonal relationships (Ekman, 2000). Facial affect were thought to be correspondence with experienced feeling for healthy people. However, it was suggested that schizophrenia patients have difficulties in expression of what they felt. The term flat affect or blunted affect imply diminished expression of emotion in schizophrenia patients (APA, 2006).

Flat affect have been a fundamental symptom of schizophrenia since Bleuler (Kohler, & Martin, 2006). Studies related to flat affect symptom usually focuses on facial expression of patients (Alpert, Rosenberg, Pouget, & Shaw, 2000). Facial Active Coding System (FACS) developed by Ekman and Friesen, EMFACS developed by Friesen were developed to measure to analyze facial emotional expressions. In addition to these standardized measures, negative symptom subscale of Positive and Negative Symptom Scale (PANNS) includes observer-based rating for flat affect.

Kring and colleagues (1993) reported that, schizophrenics showed less facial expression than normal subjects in response to emotion eliciting films whereas their report on experiencing emotion were not significantly different than normal subjects. They explained the results suggesting that schizophrenia patients feel emotions as well as healthy people; however they are not able to facially express their emotion due to blunted affect.

Additionally, research suggested that affect recognition and affect expression are unrelated (Shaw, Dong, Lim, Faustman, Pouget, Alpert, 1999). They applied Florida Affect Battery to assess impairments in recognizing facial and vocal affect; Scale for the Assessment of Negative Symptoms (SANS); and a computerized measure (VOXCAM) to assess flat affect and alogia. No significant relationship was revealed between recognition of affect and expression of affect, in the study.

Another study was conducted (Schwartz, Mastropaolo, Rosse, Mathis, & Deutsch, 2006) to measure the imitation ability of schizophrenia patients. Patients were asked to imitate facial expression provided by static images. They found that schizophrenia patients were worse than control group in imitation of facial expression.

To summarize, flattening affect is a fundamental symptom of schizophrenia, and patients are disabled in expression of what they felt which lead to social outcome impairments.

#### **1.4 Symptomatology and Emotional Processing**

Schizophrenia is characterized by positive and negative symptoms. Positive symptoms of schizophrenia are hallucination, delusions, disorganized speech/thoughts, disorganized, and/or catatonic behavior. Negative symptoms consist of affective flattening, alogia and avolition (APA, 2000).

Sergi and colleagues (2007) studied the relationship between perception of ability and negative symptoms of schizophrenia. They applied Facial Emotion identification Test and Voice Emotion Identification Test to 100 schizophrenia patients to assess emotion identification ability and the Scale for the Assessment of Negative Symptom was used to assess negative symptoms of schizophrenic patients. In addition to these they also added neurocognitive function tests such as; California Verbal Learning, Wisconsin Card Sorting and Letter-Number Span tests. They found a moderate negative correlation between social cognition abilities and negative symptoms. Similarly, amplification of emotion impairment (Henry, Green, Lucia, Restuccia, McDonald, & O'Donnell, 2007), and emotion discrimination (Sachs et al., 2004) was found significantly correlated with negative symptoms of schizophrenia, measured by The Scale for the Assessment of Negative Symptoms. Patients with negative symptoms were also found having diasability in labelling fear (Wout, Aleman, Kessels, Cahn, Haan, & Kahn, 2007; Archer, Hay, & Young, 1992).

However, there are also contradictory results suggesting that perception of emotion is independent from negative symptoms (Silver & Shlomo, 2001; Addington & Addington, 1998). Silver and Shlomo (2001) suggested that impaired perception of emotion is a result of cognitive impairments not a result of negative symptoms.

Experience of emotion was found to be related to affective negative symptoms of schizophrenia (Suslow, Roestel, Ohrmann, & Arolt, 2003). They

indicated that patients with affective symptoms report less experience of positive emotions such as; joy and interest than patients without affective negative symptoms. However there was no difference between these groups in experiencing fear.

Mandal, Pandey, & Prasad (1998) suggested that patients with positive symptoms are impaired in recognition of “sadness” emotion. In addition to this, Combs and Gouiver (2006) and Peer (2004) found that patients with paranoia had impairment in the perception of emotion ability. It was thought that hallucinations and non-persecutory delusions would interrupt perception of emotion performance through distracting attentional system (Combs & Gouiver, 2004; Nelson, Combs, Penn, & Basso 2007). In contrast, some researchers found that schizophrenia patients with paranoid symptoms are better in social and emotion perception tasks than non-paranoid group (Davis, & Gibson, 2000; Kline, Smith, & Ellis, 1992; Lewis & Garwer, 1995).

### **1.5 Duration of Illness**

The effect of duration of illness on patients’ physical and psychosocial life is important since most of the schizophrenia patients develop chronicity (APA, 1994, cited in Saha et al., 2005). Duration of illness in schizophrenia is found to be in a relationship with the neurological changes in brain; such as ventricular enlargement, sizes of prefrontal cortical grey matter, premotor cortical and putamen volumes (Premkumar et al., 2006), cognitive functioning (Saykin et al, 1994), and emotion processes (Hoekert, et al., 2007).



The literature on the effect of duration of illness on cognitive functioning is contradictory (Cuesta, Peralta, & Zarzeula, 1998). Although there is considerable support that cognitive impairments occur at onset (Hoff, Riordan, O'Donnel, Morris, & Delisi, 1991; Goldberg, Hyde, Kleinmann, & Weinberger, 1993), there is less evidence that impairments increase with time (Sweeney, Hass, & Li, 1992; Bilder, Lipschitz-Broch, Reiter, Geisler, Mayerhoff, & Lieberman, 1992). However, there also studies indicating no difference between acute and chronic patients in terms of cognitive impairments (Heaton, Gladsjo, Palmer, Kuck, Marcotte, Jeste, 2003).

Stratta, Arduin, Daneluzzo, Rinaldi, Genova and Rossi (2003) measured cognitive abilities of schizophrenia patients by Wisconsin Card Sorting Test (WCST). They created 3 group in terms of duration of illness; duration less than 5 years, 5 to 10 years and more than 10 years. They found no progressive performance deficit on WCST.

Kucharska-Pietura, David, Masiak, and Philips (2005) found that chronic schizophrenia patients are worse in emotion perception tasks of facial and vocal emotion than acute patients. They suggested that acuity increases emotion perception deficits. Impairment in ToM was also found positively correlated with duration of illness which indicates chronically ill patients perform worse than acute patients in terms of making true understanding of others' mental states and intentions (Drury, Robinson, & Birchwood, 1998; Brüne, 2003, and Brüne, 2005)

Pinkham, Penn, Perkins, Graham and Siegel (2007) compared individuals who are at-risk for psychosis with patients having early and chronic schizophrenia spectrum disorders in terms of emotion perception and social skills to measure the effect of acuity of illness. They found no difference between individuals at risk and control group in terms of emotion perception measures; however social skill deficits of individuals at risk were higher than control group. In addition to these, early and chronic group both performed similarly but worse than at-risk and healthy subjects in terms of perception of emotion. They suggested that social skill deficits are present before the illness and should be evaluated as a vulnerability factor, whereas emotion perception disability arises at the same time with psychosis. Therefore both social skills and emotion perception deficits are thought to be independent from the acuity of schizophrenia. Similarly, recognition and expression impairment of emotional prosody were also found impaired at the onset of the illness and was stable over time (Hoekert et al., 2007).

Presence of emotion perception deficits, in early stages of illness and even in prodromal phase and the first degree relatives' of patients was explained through underlying pathobasal mechanisms (Reske, Kellerman, Habel, Shah, Backes, Wilmsdorff, Stöcker, Gaebel, & Schneider, 2007).

Differences in results of the studies investigating effect of duration of illness on social and cognitive abilities usually explained in variance of instruments and methodology (Nelson et al., 2007).

## **1.6 Significance and Purpose of the Study**

As mentioned above, schizophrenia patients have problems in emotional processes; perception, experience and expression. Therefore they have difficulties in social interaction which usually result in social withdrawal. However the results in the literature are lacking empirical supports considering the underlying reasons of these impairments and the relationship between processes.

It is important to investigate the relationship between perception, experience and expression of emotion in a cognitive perspective. Within this perspective, the interaction between other factors such as; duration of illness and positive and negative symptoms, and their relatedness to the emotional process should be studied.

Present study includes emotion eliciting scenes in order to: a) provide more emotional cues than just giving static facial expressions; b) to understand whether patients are capable of understanding these cues, and c) to elicit emotion which would lead to expression of emotion.

The present study aims to understand the effect of duration of illness and symptomatology on the impairments of schizophrenia patients in terms of understanding social context of emotion eliciting scenes, experience of emotion through the film and facial expression if an emotion is experienced.

For differentiating the groups in terms of the duration, the cut off point is decided as 10 years. The patients who have been diagnosed as having schizophrenia for more than 10 years are considered as “chronic patients”, whereas, patients who are ill for less than 10 years are considered as “patients with short duration of illness”.

Positive symptoms such as delusions may affect understanding of social cues which may result in the fake experience of emotion and false expression of emotion. However a relationship would not be expected between positive symptoms and expression of emotion. Expression of emotion, as mentioned above, is more related to the negative symptoms which are not found to be related to social cognition. Therefore different factors may play role in different stages of emotional processing.

In this sense this study examined the hypotheses below:

1. Schizophrenia patients, who are ill more than 10 years (chronic patients) are expected to perform worse in understanding social context task than patients who are ill for less than 10 year (patients with short duration of illness) and patients with short duration of illness will perform worse than control group

2. Chronic patients are expected to report less experience of emotion toward the scenes when compared to patients with short duration of illness and patients with short duration of illness will report less experience of emotion than the control group
3. Chronic patients are expected to show less facial expression than patients with short duration of illness and patients with short duration of illness is expected to show less expression of emotion than the control group
4. Positive symptoms of schizophrenia is expected to be positively correlated with understanding the context and is not expected to be related to the experience and expressions of emotion
5. Negative symptoms of schizophrenia are expected to be positively correlated with the experience and expression of schizophrenia but not with the understanding social context.

## **CHAPTER II**

### **METHOD**

#### **2.1 Participants**

The sample of this study consisted of 69 subjects including 46 schizophrenia patients and 23 healthy subjects.

For the two experimental groups, 23 schizophrenia patients with an illness duration of shorter than 10 years (“patients with short duration of illness”) and 23 patients with a duration of longer than 10 years (“chronic patients”) were recruited from Ankara Oncology Hospital Psychiatry Clinic. Patients with diagnosis of schizophrenia according to DSM-IV-TR criteria, were not hospitalized during last one month period, and had no mental retardation diagnosis were selected for this study. The information of the duration times and the onset of the illness for both experimental groups are given in Table 2.1.

For having participants with similar educational levels, control group data were collected from 23 participants living in Kırşehir. The exclusion criteria of the subjects for the control group were having a psychiatric illness history of the self or primary relative, and obtaining scores higher than cut of point in any of Brief Symptom Inventory subscales.

Table 2.1. Illness duration and Onset age of Illness of Experimental Groups

	<b>“Chronic” (N = 23)</b>	<b>“Short Duration” (N = 23)</b>
<b>Duration of illness</b>	<i>M</i> = 17.87 SD = 7.46	<i>M</i> = 5.50 SD = 2.03
<b>Onset age of illness</b>	<i>M</i> = 21.83 SD = 5.67	<i>M</i> = 25.39 SD = 9.99

*N* = 46

The sociodemographic characteristics for the two experimental groups, and control group separately and also for the overall participants are summarized in Table 2.2.

## 2.2 Instruments

All participants were shown a clip consists of information about study, four different scenes which expected to elicit a specific emotion and distractors between scenes (see Appendix F). At the end of each scene participants filled in a questionnaire consisting of two questions (see Appendix A). First question was “Which emotion did you feel while watching the scene”. The aim of the question was to detect experienced emotion of participants. Participants’ correct responses were coded as 0 and faulty responses were coded as one. At the end the participant got a score between 0 to 4. 0 indicates no faulty experience was reported, whereas 4 indicates that participants’ all responses were faulty, in terms of experience of emotion.

Table 2.2 The socio-demographic characteristics of the total subjects and groups

	<b>Control Group</b>	<b>Short Duration G.</b>	<b>Chronic Group</b>	<b>Total</b>
<b>Gender</b>				
<b>Male</b>	14	12	17	43
<b>Female</b>	9	11	6	26
<b>Mean Age</b>	34.22 (SD = 9.249)	31 (SD = 10.523)	39.70 (SD = 10.196)	34.97 (SD = 10.498)
<b>Means of Total year of education</b>	8.65 (SD = 3.638)	8.96 (SD = 4.290)	9.87 (SD = 3.307)	9.16 (SD = 3.748)
<b>Marital Status</b>				
<b>Single</b>	12	6	11	29
<b>Married</b>	10	16	10	36
<b>Divorced</b>	1	1	1	3

The second question was “In this scene, which emotion was aimed to be elicited in the audience?” The aim of the question was to measure whether participants are capable of understanding the context of scenes. Participants’ correct responses were coded as 0 and faulty responses were coded as 1. Subjects gather a score between 0 to 4, high scores indicating more faulty responses in terms of understanding context.



In addition to these, demographic information was gathered from all participants. Two different demographic information forms were used for the experimental group (see Appendix B) and healthy group (see Appendix C).

Positive and Negative Syndrome Scale, was used to measure positive, negative and general symptomatology of schizophrenia patients. In addition to this Calgary Depression Scale were applied to assess depression levels of schizophrenia patients.

Brief Symptom Inventory, was applied to all control group, to decide whether they meet criteria of healthy group.

### **2.2.1 Selection of Scenes**

3 criterions were used in the selection of scenes; eliciting only one emotion in a period of time, short duration and including cues related to aimed emotion. Movies, television series and advertisements were investigated in terms of these criteria by the experimenter. A celebration scene, with duration of 25 seconds, including happy faces of a group of soldier was chosen from the movie "Crimson Tide" (1995) in order to elicit happy emotion in audience. Introduction scene of the movie "The Grudge" (2004) that includes a sudden appearance of scary face was chosen as the fear scene. Duration of the fear scene was 37 seconds. A scene from a Turkish television series (Hatırla Sevgili, 2007) including separation conversation of a couple, was presented as a sadness eliciting scene. Duration of the scene was 56 seconds. At last,

an advertisement, including an abhorrent meal preparation scene, with duration of 60 seconds was chosen as the disgusting scene.

### **2.2.2 Positive and Negative Symptom Scale (PANSS)**

PANSS was developed as a semi-structured interview, to measure negative, positive and general symptomatology in schizophrenia (Kay, Opler, and Lindenmayer, 1988). It consists of three subscales; positive, negative and general symptoms subscales. Positive and negative subscales include 7 items and general symptomatology subscale includes 14 items. Items were rated through a 7-point Likert scale (see Appendix D). 1 indicates absence of mentioned symptom whereas, 7 indicates extreme experience of symptom.

Kay, Fiszbein, and Opler (1987) found .73, .83, .79 Cronbach alpha values for positive, negative and general symptomatology subscales, which indicate a high internal consistency. Inter-rater reliability correlation scores were, .83, .85 and .87 for positive, negative and general symptomatology subscales, respectively. They suggested that PANSS is a valid and reliable instrument of measuring positive, negative and general symptomatology in schizophrenia.

Validity and reliability study of PANSS in Turkish sample was conducted by Kostakoğlu, Batur, Tiryaki, and Göğüş (1999). Cronbach alpha values of positive, negative and general symptomatology subscales were found, .75, .77, .71, respectively. Inter-rater correlation co-efficients of scales were .97 ( $p<.0001$ ) for positive subscale, .96 ( $p<.0001$ ) for negative subscale and .91 ( $p<.0001$ ) for general symptomatology subscale and .96 ( $p<0.001$ ) for total of the scale.

Kostakoğlu and colleagues (1999) indicated that PANNS is a valid and reliable scale in measurement of positive, negative and general symptomatology of schizophrenia patients in Turkish sample.

### **2.2.3 Calgary Depression Scale**

Calgary Depression Scale was developed by Addington, Addington and Schissel (1990) to assess depression in schizophrenia patients. CDS is a semi-structured interview consists of 9 items. Items were rated through a likert scale from 0 to 4. Addington, Addington, and Atkinson (1996) compared CDS with Beck Depression Inventory, Hamilton Depression Scale and a depression scale derived from Brief Psychiatric Rating Scale and they found that CDS is a compatible unidimensional assessment method of depression in schizophrenia for both in and out-patient groups.

Reliability and validity study of CDS for Turkish sample was studied by Oksay, Aksaray, Kaptanoğlu, and Bal (2000). They found that CDS is a one factor questionnaire which explains %58 of total variance. They reported high internal consistency ( $\alpha=.90$ ), interrater reliability ( $\kappa= 0.87-1$ ,  $p<0.01$ ) and test-retest reliability ( $r= 0.95-1$ ,  $p<0.01$ ). They suggested that CDS is a valid and reliable measure of depression in schizophrenics, in Turkish sample (see Appendix E).

#### **2.2.4 Brief Symptom Inventory**

Brief Symptom Inventory (BSI) was developed by Derogatis (1992) to measure psychological symptoms of normal population, and psychiatric population (see Appendix F). It is a shorten form of Symptom Checklist 90 (SCL-90) consist of 53 questions and completed between 10 to 15 minutes.

BSI includes nine subscales and three global indexes. Subscales are; somatization, obsessive compulsive disorder, depression, anxiety, phobic anxiety, paranoid thoughts, psychoticism and interpersonal sensation.

Internal consistency values of subscales change between .71 (psychoticism) and .85 (depression). Test-retest reliability analysis indicated values between .68 (somatization) and .91 (phobic anxiety) (Derogatis, 1992).

Turkish adaptation study of BSI was conducted by Şahin and Durak (1994). They found 5 factors; anxiety, depression, negative self, somatization and hostility. The questionnaire was found reliable and valid in measuring these factors. Validity and reliability of scale for adolescents were also proved by Şahin, Batıgün and Uğurtaş (2002).

### **2.3 Procedure**

The aim of using scenes instead pictures was providing more cues than just facial expressions. Subjects were shown 4 different scenes in the clip, representing four emotion domains; happy, sad, fear, disgust. They watched scenes in 3 different orders, in order to prevent carry-over effect. The clips were shown using a 17-inch-screen monitor and subjects' faces recorded by a 3.1 megapixel web-camera.

Participants joined the sessions, each lasting about 15 minutes, individually but, in presence of experimenter. Subjects were informed about the aim of study but not being told about the content of scenes. At the beginning of the study, subjects were shown a trial scene, in order to increase familiarity of experiment. After participant fill the form related to trial scene, experiment clip were shown.

Experimental clip starts with an introduction of the study and followed by first scene. At the end of each scene, subjects filled a form, including questions about their feelings during the scene (experience of emotion) and the probable emotion that was aimed to elicit in audience (understanding social context). Then subjects answered 4 basic mathematic questions as distractors, to prevent carry over any emotion from scene to scene. Faces of participants were recorded through a webcam during the experiment. At the end of experimental scenes, all participants were shown a relaxation scene lasting approximately 40 seconds.

For schizophrenia patients, Positive and Negative Symptom Scale (PANSS) and Calgary Depression Scale were filled by a psychiatrist at the end of each session. Brief Symptom Inventory was only administered to control group, after the experiment completed. Demographic information of participants was collected by interviewing with participants. Information related to patients' illness were gathered through patients' first degree relative and checking hospital records, with acceptance of patients.

### **2.3.1 Coding Facial Expression**

Recorded faces of participants were used to investigate facial expressions of participants during scenes. For each scene, a time period lasting 5 seconds, in which subjects were expected to show facial expression, were decided by three psychologists. It was assumed that participants would experience elicited emotion at peak level at the period; therefore they would express emotion in that period. For happiness scene 10 to 15 seconds, for disgust

scene 12 to 17 seconds, for sadness scene 15 to 20 seconds, and for fear scene 32 to 37 seconds were chosen.

Face views, 5 second clips for each emotion, of the participants were randomly assigned to 3 raters. Raters were blind in regard to; (a) whether the participant in experimental or control group and (b) which emotion was represented in the scene when the clip was recorded. Raters were assigned to code emotion which facially expressed by participant in a given time.

Participants' correct expressions of emotions were coded as 0 and faulty expressions were coded as 1. Subjects gather a score between 0 to 4, high scores indicating more faulty responses in terms of expression of emotion.

### **2.3.2 Training of Raters**

3 graduate students were trained for three hours, according to facial expression coding principles in Ekman and Friesen (1975), by a PhD student. Raters were trained on all 6 basic emotions; happy, sad, anger, surprise, disgust and fear. Training for each expression took approximately 30 minutes, 20 minutes for education and 10 minutes for discussion on sample pictures. At the end of the training program, raters were examined through 30 pictures from Ekman and Friesen (1975). Individual scores of raters were .92, .90, and .80, with a mean score of .87.

## **2.4 Data Analysis**

Descriptive statistics were used for data analysis of the general characteristics of the sample and for categorization of schizophrenics into long-term and short-term chronicity of illness.

Multivariate Analysis of Variance (MANOVA) was used separately to investigate the differences in emotional processes of healthy group, and schizophrenic groups.

Multivariate Analysis of Covariance (MANCOVA) was used to investigate the effect of duration of illness on emotional processes; perception (understanding of social context), experience and expression of emotion when depression level was controlled.

The relationship between positive and negative symptoms of schizophrenia and emotional processes were investigated throughout correlation analysis.

All statistical analysis were run by using Statistics Package for the Social Sciences (SPSS), version 11.5 for Windows; a computer program for multivariate statistics.



## CHAPTER III

### RESULTS

#### 3.1 Preliminary Analysis

One-way ANOVA was conducted to test the equality of groups in terms of education. No significant difference were found between groups' year of education ( $F(2, 66) = 0.650, p > .05$ ). However, ANOVA results revealed significant differences between mean ages of chronic patients ( $M = 31.00, SD = 10.52$ ) and patients with short duration of illness ( $M = 39.70, SD = 10.50$ ),  $F(2, 66) = 4.44, p < .05, \eta^2 = .11$ .

Randomly selected records of 10 patients were assigned to all raters to investigate reliability of the raters. Then, inter-rater reliability of raters were checked through Kappa coefficient. The result was .73 which indicates moderate to high reliability.

#### 3.2 Correlational Analysis of Emotion Processes

The relationship of understanding context, experience of emotion and expression of emotion were investigated through Pearson correlation. Pearson correlation analysis revealed positive correlations between a) understanding context mistakes and experience of emotion ( $r = .705, p < .001$ ), and b) understanding context mistakes and expression of emotion

mistakes, ( $r = .291$ ,  $p < .05$ ). No significant correlation was found between experience and expression of emotion mistakes (see Table 3.1).

Table 3.1: Correlations of Emotion Processes

	<b>Understanding Context FR</b>	<b>Experienced Emotion FR</b>	<b>Expression FR</b>
<b>Understanding Context FR</b>	1		
<b>Experienced Emotion FR</b>	.705**	1	
<b>Expression FR</b>	.291*	.07	1

\*  $p < .05$

\*\*  $p < .001$

### 3.3 Schizophrenia and Emotion Processing

MANOVA analysis was run in order to investigate whether responses in emotional processes changed according to the duration of illness. Independent variable was duration of illness with three levels; healthy, short term, and chronic, dependent variables were false responses (FR) in understanding context, FR in experience of emotion and FR in expressed emotion. MANOVA results revealed significant effect of duration of illness on emotional processes (Wilks' Lambda = .50, Multivariate  $F(6, 128) = 8.70$ ,  $p < .001$ ,  $\eta^2 = .29$ ). Univariate analyses with Bonferroni corrections revealed significant effects of duration for wrong responses in understanding context

( $F(2, 66) = 13.908, p < .001, \eta^2 = .30$ ), for experienced emotion ( $F = 5.596, p < .01, \eta^2 = .15$ ) and expressed emotion ( $F(2, 66) = 16.803, p < .001, \eta^2 = .34$ ) (see Table 3.2).

Post-hoc comparison, with Tukey Honestly Significant Difference, conducted for the main effect of duration indicated that chronic patients ( $M = 1.826, SD = .216$ ) were significantly worse than healthy ( $M = 0.217, SD = .216$ ) and short duration of illness group ( $M = 0.913, SD = .216$ ) in terms of understanding context. No significant difference was found between healthy group and short duration group (see Figure 3.1).

It was also found that chronic group ( $M = 1.609, SD = .215$ ) performed significantly worse than healthy group ( $M = 0.609, SD = .215$ ) in terms of experienced emotion response. No significant differences were found between performances of control group and SD group ( $M = 0.957, SD = .215$ ).

Post-hoc analysis revealed that patients with short duration ( $M = 3.5223, SD = .164$ ) and chronic patients ( $M = 3.304, SD = .164$ ) showed significantly less expected expression of emotion than healthy group ( $M = 2.261, SD = .164$ ). No significant difference was found between responses of patients with short duration and chronic group.

Table 3.2: Univariate Analyses of Duration and Illness Effect on Emotional Processes

		Type III				
Source	Dependent Variable	Sum of Squares	df	Mean square	F	Sig
<b>Duration</b>	Experience	11.855	2	5.928	5.596	.006
	Understanding	29.942	2	14.971	13.908	.000
	Facial Expression	20.899	2	10.449	16.803	.000
<b>Error</b>	Experience	69.913	66	1.059		
	Understanding	71.043	66	1.076		
	Expression	41.043	66	.622		

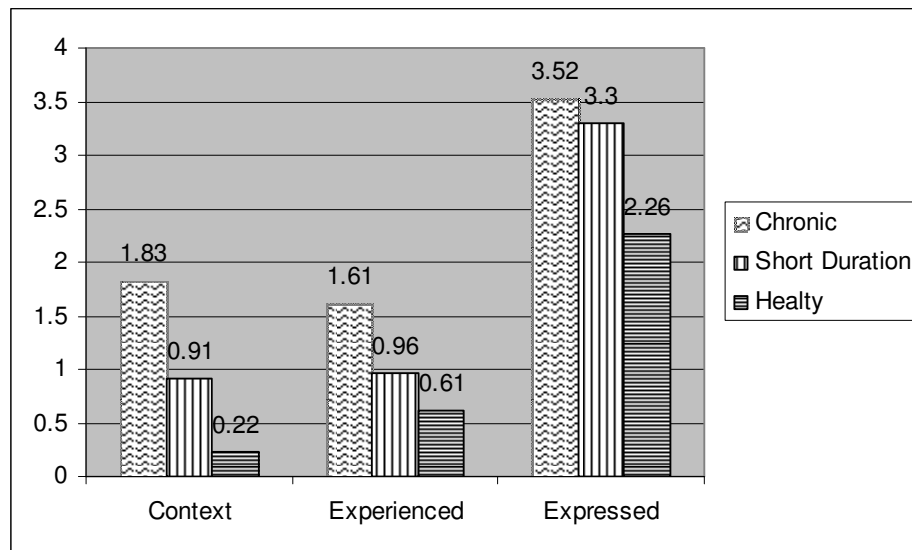


Figure 3.1: Mean Scores of False Responses of Chronic, Short Duration of Illness and Healthy Groups

### 3.4 Duration of Illness and Emotion Processing

Effect of duration of illness (chronic group and short-term group) on emotion processes (understanding, experience, and expression of emotion) when depression controlled was investigated through Multivariate Analysis of Covariance. MANCOVA, revealed no significant multivariate effect of duration of illness (Wilks' Lambda = .861, Multivariate  $F(3, 41) = 2.209$ ,  $p > 0.05$ ,  $\eta^2 = .14$ ) and depression scores (Wilks' Lambda = .976, Multivariate  $F(3, 41) = .341$ ,  $p > 0.05$ ,  $\eta^2 = .02$ ) on emotion processes. No significant effect of duration was found in experience of emotion and emotion expression, when depression controlled.

### 3.5 Symptoms of Schizophrenia and Emotion Processing

Pearson Correlation was performed to investigate the relationship of positive, negative, general symptoms of schizophrenia and emotional processes; understanding context, experience and expression of emotion.

Positive symptoms of schizophrenia were found to be correlated with understanding context ( $r = .497, p < .001$ ). It was revealed that as positive symptoms increases wrong responses in understanding context also increases (see Table 3.3).

Table 3.3. Correlation Analysis of Symptoms and Emotion Processes

	<b>Understanding Context FR</b>	<b>Experienced Emotion</b>	<b>Facially Expressed Emotion FR</b>
<b>Positive Symptoms Subscale</b>	.497*	.257	-.053
<b>Negative Symptoms Subscale</b>	.271	.201	-.085
<b>General Symptoms Subscale</b>	.272	.106	.054

\*p<.001

## **CHAPTER IV**

### **DISCUSSION**

Emotional processing starts with perception and understanding of our social environment. Following, we make cognitive attributions on what we perceived and that leads to the experience of emotion. Afterwards, we behave, and/or produce verbal, facial, postural emotion expressions accordingly (Beck, 1976). The emotional processing as a whole impairs in many of the psychopathological conditions, like schizophrenia (Green, Waldron, & Coltheart, 2007; Kohler & Martin, 2007). Although, this is the case, in the literature we do not come up with the studies that examine the emotional processing impairments as a whole in schizophrenia.

The aim of the present study was to investigate whether emotional processes, understanding context, experience and expression of emotion were impaired in schizophrenia. In addition to that, the effect of duration of illness on emotional processes, when depression was controlled, was also investigated. Finally, the relations between symptoms of schizophrenia and emotional processes were examined.

In this part, the results of the present study will be discussed in the light of the previous literature. Then the focus will be on the limitations of the present study, clinical implications and directions for further studies.

#### **4.1 Understanding Context, Experience and Expression of Emotion**

It was proposed that, emotional processing begins with the perception and appraisal of events (Arnold, 1960, cited in Beck, 1976). Without a proper contextual appraisal, appropriate emotional experience and, consequently, appropriate postural presentation of emotion is impossible (Adolphs, 2001). In consistent with this suggestion, preliminary correlational analyses of the present study revealed that, misunderstanding of context is positively related to the report of unexpected emotional experience and unexpected and/or absence of facial expression of emotion. Since the analyses are correlational, drawing a causal inference is not possible, however, the results show that, understanding of the context and experience and expression of emotions are not independent processes.

In the theory of facial expressions, Ekman and Friesen (1975) proposed that the emotion facially expressed is what is felt. Although experience and expression of emotions are not separable processes from understanding the contextual information, misunderstanding the context only should lead to the experience of an unexpected emotion but, what is experienced and expressed should again be consistent. However, the correlational analyses in the present study did not provide a significant relationship between the



reported emotion of the patients and their facial expression ratings. There may be several reasons to explain the inconsistency between the reported and expressed emotions of the participants. For instance, Jaeger, Bitter, Czobor, and Volavka (1990) proposed that, deficiency in labeling of emotions is an important problem to consider when studying schizophrenic patients. Patients with schizophrenia are found to label different emotions other than what they felt. Thus, Jaeger, and colleagues (1990) concluded that self-report measures are not reliable with this group of patients since we can never be sure whether their reported emotions are indeed what they felt. Implication of this suggestion to the result of the present study can be that, the reason why no relationship was revealed between the reported emotions of the participants and their facial expression ratings may be because of the labeling factor. Moreover, studies also indicated that, neurological and biological variables mediate the relationship between the experiential and expressional processes of emotions (Taylor et al., 2002). Thus, it is possible to explain why there is no relationship between the experienced and expressed emotions of the participants with these variables. However, since neurological and biological factors were not within the scope of the present research, the effect of these variables between the emotion processes were not examined, which will be discussed later in the limitations of the present study section.

#### **4.2 Onset and Course of Emotion Processes Deficits**

An important debate in literature is whether deficits regarding social cognition and perception of emotion appear at the onset of illness and stay stable over

time (Pinkham et al, 2007) or increase during the process of chronicity (Drury, Robinson, & Birchwood, 1998, Kucharska-Pietura et al., 2005). Considering this debate, a series of MANOVA analyses were conducted to examine the effect of onset and duration of schizophrenia on emotion process impairments. Results revealed that, in terms of understanding context variable, chronic patients had highest error rates compared to both SD and control group. However no significant differences were found between SD patients and the control group. These findings indicate that duration of illness indeed plays a role in the development of emotion process impairments, specifically for the understanding context process. However, the proposition that the impairments begin at the onset of the illness is not supported since SD patients did not significantly differ from the control group in terms of understanding emotional context, which indicated no emotion process impairments for the SD group. When the findings under consideration are evaluated as a whole, the results support the hypothesis that social cognition deficits which are little to be apparent at the onset of illness may increase over time, with the effect of duration of illness (Pinkham, et al., 2007). Moreover, neurological, cognitive and social damage due to duration of illness may also play role in the deficiency of emotion process, which should be considered in detail in further studies.

Another result of MANOVA was that number of unexpected experienced emotion or absence of experienced emotion reports of chronic patients was higher than control group. No significant differences were observed between SD group and other groups in terms of unexpected reports of experienced

emotion. However, it was accepted that, lack of experience or misexperience of emotion would developed at onset of illness and gradually increases over-time since, it was the case for anhedonia (Herbener, Harrow, & Hill, 2005).

Finally, MANOVA analyses indicated that chronic patients and patients with short duration of illness both showed less expected facial expressions compared to the control group. This finding supports the hypothesis that the impairments of facial emotion expression such as flat affect, begins with the onset of illness. However, no difference between chronic and SD group was observed, that is to say the duration of illness did not have a significant effect on the development of the impairment in the expression of emotion, indicating that the deficiency in the expression of emotion is stable over time.

To sum up, impairment in the understanding of context was found to be related with the chronicity of illness whereas deficiency in the expression of emotion was found to be related with the onset of illness. In the literature, there's a growing body of findings supporting that patients with schizophrenia develop various impairments regarding to the emotion process; such as inappropriate feeling, difficulties in understanding social cues related to emotion, to count a few (Sergi et al, 2007; Silver & Shlomo, 2001; Smith, Fowler, Freeman, Bebbington, Bashforth, Garety, Dunn, & Kuipers, 2006). However, in terms of the question regarding which impairment develops in which step, the literature is controversial (Hoekert, et. al., 2007). With the findings under consideration, the present study contributes to the resolving of

this controversy, by pointing out the durational differences between, at least, two different deficits in emotion processes.

The question regarding why different deficits appear in different durational steps of schizophrenia remains unanswered. Therefore, different underlying mechanisms such as distinct social, neurological and biological factors should be considered as being the reasons of emotional impairments in different steps of emotion processes. Considering various factors together with their interaction would be important for further understanding of emotional processes impairments.

Social withdrawal is known to have an adverse effect on the appraisal of social cues (Walker et al., 1980), therefore it's suggested that, social withdrawal is also an important factor to be taken into account while examining deficits in emotion process, as it may lead to the extinction of ability of understanding and interpreting social cues due to the decrement in using these skills.

To conclude, impairments in the emotional processes are affected differently from the course of schizophrenia. However, it should be considered that these processes are correlated with each other, that is these processes should not be treated as separable and factors related to the impairments of these processes should be investigated as a whole, within a unitary model including the interaction effects and mediator variables.

### **4.3 Duration of Illness and Emotion Processes**

As discussed in the above section, the results in the literature are contradictory in terms of the effect of duration on emotion processes (Kohler & Martin, 2007). Since depressive symptoms were found to be related in the emotion processes (Gaebel, Wölwer, 2004), the difference between the impairments in emotion processes of SD and chronic schizophrenia patients was further evaluated through MANCOVA, in which Calgary Depression Inventory (CDI) scores were used as covariate.

MANCOVA revealed similar results with that of ANOVA findings, indicating that chronic group perform worse than SD group in terms of understanding context task, even when the depression is treated as covariate. These results are confirmatory with the suggestions of Kucharska-Pietura and colleagues (2005), which indicated that emotion perception deficits of chronic patients are greater than the deficits of SD patients. Beside, understanding context task, although depression was controlled, no effect of duration of illness was observed on the experience and expression of emotion.

Although depression is not found to explain the variance in the present study, depressive symptomatology, besides other social and biological factors are known to be effective in explaining the effect of duration. The reason why no effect of depression was found in the present study may be due to the lack of other variables that are possibly in interaction with the depressive

symptomatology. Therefore, social, biological and psychopathological factors should be considered within a unitary model, as discussed in the previous section, for a better understanding of impairments in social cognition.

#### **4.4 Symptoms of Schizophrenia and Emotion Processes**

Turetsky and colleagues (2007) suggested that abnormal face encoding of schizophrenia patients is related to the delusions that the patients experience. In parallel with this suggestion, in the present study a positive correlation between positive symptoms and fault reports of understanding context task is found. The positive symptoms of schizophrenia, specifically the delusions and hallucinations, are emphasized to effect the perception of the world of patients with schizophrenia (Lindenmayer & Kahn, 2006). Thus, it is possible for the patients with high positive symptoms to have misperceived emotion related cues; vocal expressions, faces and laughs in emotion eliciting scenes.

In terms of understanding social environment, patients with more positive symptoms are thought to experience more difficulty. Moreover, although, no significant correlation was found between positive symptoms and other two emotional processes besides understanding context task; it is important to note that emotion eliciting scenes become useless in eliciting expected emotion, since patients with high positive symptoms might perceive and construe the scenes differently than others. Furthermore, lack of a correlational relationship between positive symptoms and impairment in other

emotional processes indicates the presence of other factors related to the impairments in experience and expression of emotion. These factors would be neurological, cognitive, social and motivational as discussed in detail in above sections.

Neither the positive symptoms nor general symptomatology subscales were found to be correlated with the experience of emotion deficits in schizophrenia. However, although experience of emotion is a separate process that is not influenced from the course of illness, labeling of the experienced emotion is an important part of schizophrenia discourse, which should be considered as a methodological issue in further research.

Finally, lack of a significant relationship between the expression of emotion and negative symptomatology is inconsistent with the hypotheses provided in the present study, in which a significant positive correlational result was expected between the deficiency in the expression of emotion and negative symptom subscale of PANSS which consisted of items such as flat / inappropriate affect. The unexpected finding is thought to be due to the methodological limitations of the study which are discussed in detail in the following section.

#### **4.5 Evaluation of Hypotheses**

First hypothesis of the study was that schizophrenia patients, who are ill more than 10 years (chronic patients) are expected to perform worse in

understanding social context task than patients who are ill for less than 10 years (patients with short duration of illness) and patients with short duration of illness will perform worse than healthy group. This hypothesis was partially supported since chronic patients showed the worst performance in understanding context task. However, there was no significant difference between patients with short duration of illness and healthy group. The reason for this would be derived from the relationship between duration of illness and social cognitive impairments. These impairments are expected to be increase as the duration of illness prolongs, rather than appears at the onset of the illness.

Second hypothesis suggested a significant difference between chronic, short duration and healthy group in terms of experienced emotion. This hypothesis was also partially supported by the result indicating a significant difference between chronic group and healthy group, but no significant difference between patients with short duration of illness and chronic, and healthy group. This result is contradictory with literature since, the literature about etiology of emotional impairments suggests a) deficits appear at onset of the illness and are stable over time or b) impairments increase due to illness duration. The reason for this contradiction would be the methodological limitations of the study such as, different emotion eliciting cues used in scenes and difference in duration of movies, which will be discussed in more detail in limitation of the study section.



Another hypothesis was suggesting significant difference in expression of emotion, between three groups (healthy, chronic, short duration). Results revealed significant differences between healthy group and chronic group and healthy group and patients with short duration of illness. This result was found to be parallel with the literature regarding expression of emotion deficits appear at the onset of the illness and stay stable over-time.

Forth hypothesis, indicating a relationship between positive symptoms and understanding context task was supported. Correlational analysis revealed a significant relationship between positive symptoms and false responses in understanding context task. This result is also complementary with the literature suggesting the effects of hallucinations and delusions on the perception of the world of patients with schizophrenia (Lindenmayer & Kahn, 2006). Positive symptoms may also interrupt other cognitive and/or attentional processes related to emotion perception

The last hypothesis suggested an expected relationship between negative symptoms of schizophrenia and a) experience, b) expression of emotion. It was expected that negative symptoms that includes social withdrawal, blunted/flat affect and alogia will be found correlated with impairments in emotion processes; experience and expression of emotion, as it was suggested in the literature. However, this hypothesis was not supported, since no correlational relationship was found between negative symptoms of schizophrenia and impairments in emotion processes.

#### **4.6 Limitations of the Study**

The foremost methodological limitation of the present study is the reliability and validity of the measures, specifically the scenes displayed to elicit emotions. Although the operational definitions of the emotions examined in the present study were taken into account during the election of the scenes, a pilot study would further clarify these scenes as reliable and valid instruments for eliciting certain emotions.

Another limitation of the study related to scenes was the differences in contents of the selected scenes and different duration of the scenes. Different emotion eliciting cues were presented in each scene, therefore there would be differences in terms of the emotion perception impairments due to the presented cues and perception of the cues. Presented cues and duration of the scenes should be considered as confounding variables of the study.

Moreover, the presence of the experimenter and a webcam during the display of the scenes might have played as an attention distracter role, thus might have led the participants not appropriately attend the emotional cued presented during the scenes. Besides attention distracter problem, social desirability is also another important factor to be taken into consideration. The presence of the experimenter and the webcam might have led the participants not to fully express the emotions they experienced due to the social desirability factor.

Regarding the assessment of the duration of illness, duration of untreated first episode psychosis is not considered in the present study, which is also a limitation since the length of it affects the general symptomatology as well as the cognitive impairments and prognosis (Amminger, Edwards, Brewer, Harrigan, & McGorry, 2002; Carbone, Harrigan, McGorry, Curry, & Etkins, 1999; Larsen, Moe, Vibe-Hansen, & Johannesen, 2000).

Furthermore, since the scope of the present research included the effect of the duration of illness on the impairments in emotion processes of schizophrenic patients, age should have been a controlled variable in the study because there would be some impairments due to age, not due to chronicity. Another solution would be conducting a developmental approach and considering the effect of time within a longitudinal framework would be more helpful to get a better understanding of the course of impairments in emotion processes. Longitudinal approach, besides other social and cognitive variables, would also lead to draw more precise conclusions regarding the reasons of the impairments in various steps.

Continuing with the methodological limitations, the depressive symptomatology of the schizophrenia group and the control group were assessed through different instruments. Although CDI is a reliable and valid instrument for examining depression in schizophrenia as well as Brief Symptom Inventory (BSI) is for the non-patient group, for comparing the

effect of the depression in both groups, a unique instrument should have been used.

Lack of controlling medication effect was another limitation of the study. Literature suggests that the effects of typical and atypical anti-psychotics are different in emotion processes. Former one was suggested to be related with more impairment in emotion processes, whereas later was found to be effective in treatment of negative symptoms such as; flat affect and anhedonia. Therefore, patients' medication should be considered as an important variable for further studies.

Another limitation of the study was that there were no emotion-specific analyses of emotion processes impairments. There would be a more comprehensive understanding of emotion process impairments, since literature suggesting differences of impairments due to presented emotion is whether positive or negative.

Finally, in the literature the presence of a gender difference in terms of the impairments in the perception of emotion in schizophrenia patients is discussed. In general, females are found to be superior when compared to males, in the processing of facial emotion (McClure, 2000). However, because of the immoderate gender distribution in the sample, the present study could not consider the gender effect, which is another limitation of the present study.

#### **4.7 Clinical Implications of the Study**

In parallel with the literature, the present study further provides support for the relationship between the emotional processes and the duration of illness as well as the social withdrawal. Consequently, not only to impede the social withdrawal process but also to reduce the effect of the duration of illness on the impairment of emotional procedures, supporting programs regarding the practice of emotional processes should be developed and these practices should be included in the psycho-educational programs such as social skills training.

Finally, the present study claims further support for the importance of the treatment of positive symptoms beforehand, not only because of its consequence in the decrement of negative symptoms but also its effect on the development of social competency for the patient with schizophrenia.

#### **4.8 Further Research**

The foremost suggestion to draw from the present study for further research is to use standardized assessment procedures, for instance physiological techniques, to examine the experience and expressed emotions since labeling effect is an important complication which remains unresolved in self-report measures.

As discussed in detail in the previous sections, since emotional processes are indispensable from each other; social, biological and cognitive variables should be examined together within a holistic model, comprising each processes and variables to observe the interaction and the mediator effects. Especially, cognitive functioning should be evaluated, since its relationship with social perception, social skills and social functioning was well established (Mueser, 2000).

Finally, besides the social, cognitive and neurological variables discussed above, duration of untreated first episode should also be considered in further research since it is an important factor related to the neurological and cognitive deficits.

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## APPENDICES

### APPENDIX A

#### CONSENT FORM and SELF-REPORT FORM

Sayın Katılımcı,

Bu Çalışma Orta Doğu Teknik Üniversitesi'nde (ODTÜ), Psikolog Ahmet Yasin Şenyurt tarafından, Doç. Dr. Faruk Gençöz Danışmanlığında yürütülen yüksek lisans tezi kapsamında hazırlanmıştır. Çalışma sırasında size duygulardan (utanç, üzüntü, iğrenme, süpriz, mutluluk, kızgınlık) bazılarını içeren film sahneleri gösterilecek ve izleme tutumunuz webcam ile kaydedilecektir. Aynı zamanda her sahneden sonra bu formdaki gerekli sayfaları doldurmanız istenecektir. Çekilen kamera görüntüleri ve cevaplarınız tamamen gizli tutulacaktır ve sadece bu araştırma kapsamında kullanılacaktır.

Katılımınız için teşekkürler...

Psk. Ahmet Yasin ŞENYURT  
ODTÜ Klinik Psikoloji Programı

Katılımcı Ad Soyad:.....

D No:.....

Film No:.....

**Appendix A- (continued)**

**SAYFA 1**

Lütfen sahneyi izlerken hangi duyguyu hissettiğinizi aşağıda işaretleyiniz. Lütfen bir seçenek işaretleyiniz.

Utancı	
Üzüntü	
İğrenme	
Sürpriz	
Mutluluk	
Kızgınlık	

Sizce bu sahne izleyicide hangi duyguyu yaratmak içindir? Lütfen bir seçenek işaretleyiniz.

Utancı	
Üzüntü	
İğrenme	
Sürpriz	
Mutluluk	
Kızgınlık	

1A- CEVAP:.....

1B CEVAP:.....

1C CEVAP:.....

1D CEVAP:.....

## APPENDIX-B

### Demographic form for Clinic group

Klinik Grup İin Demografik Bilgi Formu

Katılımcı No:.....

Cinsiyet:.....

Yaş:.....

Medeni Durum:.....

En son mezun olduėu okul: İlkokul Ortaokul Lise

Üniversite

Toplam Eğitim Yılı:

Hastalıkla ilgili şikayetlerin ilk başladığı yaş:.....

İlk şikayetlerin başlamasıyla, ilk tedavi girişimi arasında geçen

süre:.....AY

Kullanılan İlaçlar:

## APPENDIX-C

### Demographic form for control group

#### Kontrol Grubu İçin Demografik Bilgi Formu

Katılımcı No:.....

Cinsiyet:.....

Yaş:.....

Medeni Durum:.....

En son mezun olduğu okul: İlkokul Ortaokul Lise

Üniversite

Toplam Eğitim Yılı:

1. Derece Yakında Psikoz ve/ya Şizofreni: VAR YOK

Son 6 ay içerisinde Psikiyatrik ve/ya psikolojik şikayetlerden dolayı tedavi gördünüz mü? EVET HAYIR

## APPENDIX D

### Positive and Negative Symptom Scale

( PANSS ) POSİTİF VE NEGATİF SENDROM ÖLÇEĞİ

1= Yok    2=Çok    3=Hafif    4=Orta    5=Orta/Ağır    6=Ağır

7=Çok Ağır

Hasta adı:..... Tarih:..... Değerlendiren:.....

<i>POZİTİF BELİRTİLER ÖLÇEĞİ (P)</i>								<i>GENEL PSIKOPATOLOJİ ÖLÇEĞİ (G)</i>							
P1. SANRILAR	1	2	3	4	5	6	7	G1. BEDENSEL KAYGI	1	2	3	4	5	6	7
P2. DÜŞÜNCE DAĞINIKLIĞI	1	2	3	4	5	6	7	G2. ANKSİYETE	1	2	3	4	5	6	7
P3. VARSANILAR	1	2	3	4	5	6	7	G3. SUÇLULUK DUYGUSU	1	2	3	4	5	6	7
P4. TAŞKINLIK	1	2	3	4	5	6	7	G4. GERGINLIK	1	2	3	4	5	6	7
P5. BÜYÜKLÜK DUYGULARI	1	2	3	4	5	6	7	G5. MANYERİZM VE VÜCUT DURUŞU	1	2	3	4	5	6	7
P6. ŞÜPHECİLİK/KÖTÜLÜK GÖRME	1	2	3	4	5	6	7	G6. DEPRESYON	1	2	3	4	5	6	7
P7. DÜŞMANCA TUTUM	1	2	3	4	5	6	7	G7. MOTOR YAVAŞLAMA	1	2	3	4	5	6	7
<i>NEGATİF BELİRTİLER ÖLÇEĞİ (N)</i>								G8. İŞBİRLİĞİ KURAMAMA	1	2	3	4	5	6	7
N1. DUYGULANIMDA KÜNTLEŞME	1	2	3	4	5	6	7	G9. OLAĞANDIŞI DÜŞÜNCE İÇERİĞİ	1	2	3	4	5	6	7
N2. DUYGUSAL İÇEÇEKİLME	1	2	3	4	5	6	7	G10. YONELİM BOZUKLUĞU	1	2	3	4	5	6	7
N3. İLİŞKİ KURMADA GÜÇLÜK	1	2	3	4	5	6	7	G11. DIKKAT AZALMASI	1	2	3	4	5	6	7
N4. PASİF/KAYITSIZ BİÇİMDE KENDİNİ TOPLUMDAN ÇEKME	1	2	3	4	5	6	7	G12. YARGILAMA VE İÇGÖRÜ EKSİKLİĞİ	1	2	3	4	5	6	7
N5. SOYUT DÜŞÜNME GÜÇLÜĞÜ	1	2	3	4	5	6	7	G13. İRADE BOZUKLUĞU	1	2	3	4	5	6	7
N6. KONUŞMANIN KENDİLİĞİNDEN VE AKICI OLMASININ KAYBI	1	2	3	4	5	6	7	G14. DÜRTÜ KONTROLSÜZLÜĞÜ	1	2	3	4	5	6	7
N7. STEREOTİPİK DÜŞÜNME	1	2	3	4	5	6	7	G15. ZİHİNSEL AŞIRI UĞRAŞI	1	2	3	4	5	6	7
								G16. AKTİF BİÇİMDE SOSYAL KAÇINMA	1	2	3	4	5	6	7

PUANLAMA: Pozitif belirtiler:  Negatif belirtiler:  Genel Psikopatoloji:

Toplam:

## APPENDIX E

### Calgary Depression Inventory

#### CALGARY ŞİZOFRENİDE DEPRESYON ÖLÇEĞİ

Katılımcı No:.....

Tarih:.....

1. Depresyon: Son iki hafta boyunca ruh halinizi nasıl tanımlarsınız? Yeterince neşelenebiliyor muydunuz, yoksa son zamanlarda aşırı çökkün Ya da üzüntülü müydünüz? Son iki hafta içinde, hergün ne kadar sıklıkta kendinizi[KENDİ KELİMELERİ] hissediyorsunuz? Gün boyu?

0. Yok

1. Hafif: Sorulduğunda biraz üzüntü ya da güvensizlik ifade eder
2. Orta: Son iki hafta boyunca zamanın neredeyse yarısından fazlasında süren blirgin çökkün duygudurum: hergünvar
3. Şiddetli: Her gün zamanın yarısından fazlasında süren, olağan motor ve toplumsal işlevselliği etkileyen belirgin çökkün duygudurum

2. Umutsuzluk: Geleceğinizi nasıl görüyorsunuz? Sizin için herhangi bir gelecek var mı? Yoksa yaşam oldukça umutsuz mu görünüyor? Kendinizi koyuverdiniz mi yoksa hala çaba göstermek için neden var mı?

0. Yok

1. Hafif: Son iki hafta boyunca bazen umutsuzluğa kapılmış ama hala gelecek için belli düzeyde umut taşıyor.
2. Orta: Son iki hafta boyuncaısrarlı, orta düzeyde umutsuzluk duygusu. İşlerin daha iyiye gidebileceği konusunda ikna edilebiliyor.
- 3.Şiddetli: Israrlı ve sıkıntı veren umutsuzluk duygusu.

3. Değersizlik Duygusu: Başka inslarla karşılaştırıldığımızda, kendinizi nasıl görüyorsunuz? Kendinizi başka insanlardan daha mı iyi, daha mı kötü, yoksa yaklaşık aynı düzeyde mi görüyorsunuz? Kendinizi başkalarından aşağıda ya da hatta değersiz mi hissediyorsunuz?

0. Yok

1. Hafif: Kısmen aşağılık duygusu var; değersizlik duygusu düzeyine ulaşmıyor.
2. Orta: Kişi kendini değersiz hissediyor: ama zamanının yarısının azında
3. Şiddetli: Kişi zamanının yarısından fazlasında kendisini değersiz hissediyor. Öyle olmadığı konusundaikna edilebiliyor



## Appendix E (continued)

4. Suçlulukla İlgili Alınma Düşünceleri: Bir konuda itham edildiğiniz ya da hatta haksız yere suçlandığınız duygusuna kapıldınız mı? Hangi konuda?(Doğrulanabilir itham ya da suçlamaları dahil tmeyin. Suçluluk sanrılarını dışlayın)

0. Yok

1. Hafif: Kişi zamanın yarısından azında kendini itham altında hisseder ama suçlu hissetmez

2. Orta: İtham altında olduğuna dair ısrarlı duygular ve/veya ara sıra suçlu olduğuna dair duygular

3. Şiddetli: Suçlu olduğuna dair ısrarlı duygular. İkna edilmeye çalışılınca öyle olmadığını kabul eder

5. Patolojik Suçluluk: Geçmişte yapmış olabileceğiniz önemsiz şeylerden dolayı kendinizi kabahatli bulma eğiliminde misiniz? Bu konuyla bu derecede uğraşmayı hakettiğinizi düşünüyor musunuz?

0. Yok

1. Hafif: Kişi bazen bazı küçük kabahatler konusunda olması gerekenden daha fazla suçluluk duyar, ama bu, zamanının yarısından azını alır

2. Orta: Kişi çoğu zaman önemini abarttığı geçmiş eylemleri konusunda suçluluk duyar.

3. Şiddetli: Kişi çoğu zaman kötü giden herşey için, hatta kendi hatası olmasa bile kendini kabahatli hisseder

6. Sabah Depresyonu: Son iki hafta boyunca, kendinizi çökkün hissederken, bu çökkünlüğün günün belli bir zamanında daha kötüleştiğini fark etiniz mi?

0. Depresyon yok

1. Hafif: Depresyon var ama gün içi değişkenlik yok

2. Orta: Depresyonun sabahları kötüleştiğini keniliğinden belirtir

3. Şiddetli: Sabahları belirgin biçimde daha kötü olan v işlevselliğin bozulduğu depresyon akşamları kendiliğinden düzelir.

## Appendix E (continued)

7. Erken Uyanma: Sabahları normalden daha erken mi uyanıyorsunuz? Bu haftada kaç kez oluyor?

0. Yok: Erken uyanma yok
1. Hafif: Ara sıra (en çok haftada 2 kez) olağan ya da gerekli uyanma zamanından en az 1 saat öne uyanıyor
2. Orta: Çoğunlukla (haftada en az 5 kez) olağan ya da gerekli uyanma zamanından en az 1 saat önce uyanıyor
3. Şiddetli: Her gün uyanma zamanından en az 1 saat önce uyanıyor

8. Özkıyım: Hayatın yaşamaya değer olmadığını hissediyor musunuz? Yaşamınıza son vermek hiç içinizden geçti mi? Kendinize ne yapabileceğinizi düşündünüz? Gerçekten denediniz mi?

0. Yok
1. Hafif: Sıklıkla keşke ölmüş olsaydım biçiminde düşünceler ya da ara sıra özkıyım düşünceleri
2. Orta: Üzerinde uğraşılmış özkıyım tasarısı ama girişimde bulunulmamış
3. Şiddetli: Açıkça ölümle sonuçlanmk üzere hazıranmış özkıyım girişimi

9. Gözlenen Depresyon: Tüm görüşme boyunca görüşmecinin gözlemlerine dayanır. Görüşmede uygun anlarda sorulan “Kendinizi ağlamaklı hissediyor musunuz?” sorusu bu gözlem için gerekli bilgiyi sağlayabilir.

0. Yok
1. Hafif: Görüşmecinin belirgin olarak yansız konuşmalarını içeren bölümlerinde bile kişi üzgün ya da kederli görünebilir
2. Orta: Kişi görüşme boyunca sikkın, tek düze bir ses tonuyla üzgün ve kederli görünmektedir ve bazen ağlar ya da ağlamaklı olur
3. Şiddetli: Kişi sıkıntı veren konularda boğulacak gibi olur, sıklıkla derin iç çeker ve açıkça ağlar, ya da kişi ısrarlı olarak ıstraptan donakalmış durumdadır ancak görüşmei depresyonun varolduğundan emindir

**TOPLAM PUAN:** \_\_\_\_\_

**APPENDIX F**  
**Brief Symptom Inventory**

**KISA SEMPTOM ENVANTERİ (KSE)**

Aşağıda belirtilen semptomları son bir ay içerisinde ne kadar yaşadığınızı aşağıdaki rakamları kullanarak belirtiniz

Katılımcı No: \_\_\_\_\_

Hiç Yok 0	Çok Az 1	Orta Derecede 2	Oldukça Fazla 3	İleri Derecede 4
MADDELER				CEVAPLAR
1	İçinizdeki sınırlılık ve titreme hali			
2	Baygınlık , baş dönmesi			
3	Bir başka kişinin sizin düşüncelerinizi kontrol edeceği fikri			
4	Başınıza gelen sıkıntılardan dolayı başkalarının suçlu olduğu duygusu			
5	Olayları hatırlamada güçlük			
6	Çok kolayca kızıp öfkelenme			
7	Göğüs ( kalp ) bölgesinde ağrılar			
8	Meydanlık(açık) yerlerden korkma duygusu.			
9	Yaşamımıza son verme düşüncesi.			
10	İnsanların çoğuna güvenilemeyeceği hissi.			
11	İştahta bozukluklar.			
12	Hiçbir nedeni olmayan ani korkular.			
13	Kontrol edemediğiniz duyguların patlamaları.			
14	Başka insanlarla beraberken bile yalnızlık hissetme.			
15	İşleri bitirme konusunda kendini engellenmiş hissetme.			
16	Yalnızlık hissetme.			
17	Hüzünlü, kederli hissetme.			
18	Hiçbir şeye ilgi duymamak.			
19	Kendini ağlamaklı hissetme.			
20	Kolayca incinebilme , kırılma.			
21	İnsanların sizi sevmediğini, size kötü davrandığına inanma.			
22	Kendini diğer insanlardan daha aşağı görmek.			
23	Mide bozukluğu, bulantı.			
24	Diğer insanların sizi gözlediği ya da hakkınızda konuştuğu duygusu.			
25	Uykuya dalmada güçlük.			
26	Yaptığınız şeyleri tekrar tekrar doğru mu diye kontrol etmek.			
27	Karar vermede güçlükler.			
28	Otobüs, tren, metro gibi unumi vasıtalarla seyahatlerden korkma.			
29	Nefes darlığı , nefessiz kalma.			
30	Sıcak,soğuk basmaları.			
31	Sizi korkuttuğu için bazı eşya yer ya da etkinliklerden uzak kalmaya çalışmak.			
32	Kafanızın bomboş kalması.			
33	Bedeninizin bazı bölgelerinde uyuşmalar,karıncalanmalar.			
34	Hatalarınız için cezalandırılmanız gerektiği düşüncesi.			
35	Gelecekle ilgili umutsuzluk duyguları.			
36	Dikkati bir şey üzerine toplamada güçlük.			
37	Bedenin bazı bölgelerinde ,zayıflık, güçsüzlük hissi.			
38	Kendini gergin ve tedirgin hissetme.			
39	Ölme ve ölüm üzerine düşünceler.			

## APPENDIX F (Continued)

41	Birşeyleri kırma ,dökme isteği.	
42	Diğer insanların yanında iken yanlış bir şey yapmamaya çalışmak.	
43	Kalabalıklardan rahatsızlık duymak.	
44	Başka insanlara hiç yakınlık duymamak.	
45	Dehşet ve panik nöbetleri.	
46	Sık sık tartışmaya girmek.	
47	Yalnız kaldığında sinirlilik hissetme.	
48	Başarılarınıza rağmen diğer insanlardan yeterince takdir görmemek.	
49	Kendini yerinde duramayacak kadar tedirginlik hissetmek.	
50	Kendini değersiz görme duygusu.	
51	Eğer izin verirsiniz insanların sizi sömüreceği duygusu.	
52	Suçluluk duyguları.	
53	Aklınızda bir bozukluk olduğu fikri.	

## **APPENDIX G**

### **Emotion Eliciting Scenes**

Include cd in hard copy