

**Interpretation of Hemingway in psychoses:
a new method to study social cognition**

PhD thesis

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Abbreviations

CET - Cognitive Enhancement Therapy

CG - Control Group

IPT - Integrated Psychological Therapy

NET - Neurocognitive Enhancement Therapy

PANSS - Positive and Negative Syndrome Scale

RCT - Randomized Controlled Trials

SAT-MC - Social Attribution Task, Multiple-Choice Version

SCID-5 - Structured Clinical Interview for DSM-5

SG - Schizophrenia Group

SILS - Social and Independent Living Skills

SPSS - Statistical Package for Social Science

SST - Short Story Task

ToM - Theory of Mind

1. Introduction

Schizophrenia, a severe and disabling brain disorder, is affecting 0,85% (0,4–1,4%) of the general population. It is frequently a life-long and deteriorating disorder. Schizophrenia begins in early adulthood, and the disorder usually disrupts the way of life. Most of the persons living with schizophrenia are unable to finish their studies or maintain a job career. Beside the clinical symptoms of schizophrenia social dysfunction is the trademark of schizophrenia and a major burden on the individual and on their families. This dimension fundamentally determines the functional outcome of the disorder, and so it plays an important role in the deteriorating course of the disorder. Social functioning is the result of the interaction between social capacity and performance. Social capacity is determined by the different aspects of social cognition, and performance is characterized by the so-called sending skills, which includes the verbal and non-verbal communication skills that are indispensable for successful handling of social situations (Dickinson et al., 2007). The social dysfunction in schizophrenia is characterized by deficits in social cognition and also in social competence. While a great body of literature deals with the deficits of social functioning in schizophrenia, still only a few, if any, assessment tools can detect the deficits accurately in spite of the certainty of the presence of the diversified impairments (Pinkham et al., 2015). A significant amount of progress has been made on the other hand in documenting the effectiveness of social intervention strategies for schizophrenia.

For over five decades, the availability of antipsychotic drugs and various forms of community care have made it possible for schizophrenia patients to be released from psychiatric facilities, however the rate of relapse, the occurrence of rehospitalization, and the low level of social functionality have not diminished sufficiently (Jaaskelainen et al., 2013, Kopelowicz et al., 2006). Although antipsychotics brought a breakthrough in the treatment of schizophrenia, a significant amount of evidence confirmed that best results can be achieved with the combination of drug treatment and psychosocial interventions. Implementing evidence-based psychosocial interventions to everyday clinical practice, however, is rather slow usually due to lack of different types of resources (Drake et al., 2009). These facts emphasize the necessity of new ways in research approaches promising easily implementable opportunities to measure and treat social impairments.

Present thesis is based on three different publications (Fekete, 2017; Fekete et al., 2020; Fekete and Herold, 2020) with the first part of the thesis giving an overview of various research on social functioning and a narrative review on the efficacy studies of social skills training for patients with schizophrenia (Fekete, 2017). The aim of the first segment is to provide foundation for the second part of the thesis that introduces a new tool for assessing Theory of Mind (ToM) in schizophrenia, with ToM being the key component of social cognition (Fekete et al., 2020), also playing a potentially important role in future psychosocial interventions (Fekete and Herold, 2020).

2. Social functioning in schizophrenia

Impaired social functioning is a hallmark symptom of schizophrenia. The problems of social relationships and role functioning usually precede the onset of the disorder, while being present in the premorbid or prodromal phase of schizophrenia, and this impairment is also a characteristic feature of the disorder during the course of schizophrenia (Mueser et al., 2006). Patients with schizophrenia usually exhibit difficulties in achieving social developmental milestones, their peer relationships are poorer, they have a reduced social network, often lacking intimate relationships, and they scarcely get married. Persons with schizophrenia rarely achieve a higher level of educational degrees, frequently unemployed, usually unable to live independently, thus they more often rely on public assistance. This domain is so important that the impaired social functioning is even required for the diagnosis of schizophrenia both in DSM and BNO, and hence, we can say that social dysfunction is a core feature of schizophrenia (Mueser et al., 2006).

Social dysfunction can be detected as early as in childhood. According to the home movie studies of Elain Walker children later developing schizophrenia can be distinguished from controls within the first 8 years of life only by observing their social behaviors (Walker and Lewine, 1990). Most recently a 20 years longitudinal study confirmed that deficits in social functioning are already evident in childhood, and children with worse social functioning experience a major decline in adolescence, which in turn predicts worse 20-year real-life functional outcomes (Velthorst et al., 2017). They detected four stable trajectories (preserved, moderately, severely, and profoundly impaired social functioning). According to these results the years between adolescence and the onset of the disorder constitute a critical period, when individuals exhibit a marked decline in social functioning, which is a strong predictor of later functioning. Persistent and massive decrease can be detected in adolescence in 75% of persons with schizophrenia spectrum disorder with a rather stable trajectory, and only a minority of patients (1,5%) showed comparable level of social functioning with control subjects. Most recently a blunted trajectory in mentalizing skills was also reported among clinical high-risk adolescent individuals (Davidson et al., 2018), which seems to support the role of social dysfunction in the premorbid phase of schizophrenia.

Social functioning is a controversial term with several definitions (Bruns and Patrick, 2007, Mueser et al., 2006, Bromley and Brekke, 2010). According to a recently proposed operational definition in schizophrenia, social functioning can be conceived as the result of the interaction between social capacity and performance/competence (Rus-Calafell et al., 2014). Social capacity involves the different aspects of social cognition. Social cognition includes the perception (receiving skills) of intentions and dispositions of others, the interpretation of social information, and also the generation of response according to the social context (Brothers, 1990). Social performance is characterized by the sending skills, which includes the verbal and non-verbal communication skills that are indispensable for successful handling of social situations (Dickinson et al., 2007). The social dysfunction in schizophrenia is characterized by deficits in social cognition and also in social competence.

3. Social cognition in schizophrenia

After the various new research findings of neurocognition social cognition has been gaining more and more attention within the cognitive studies of schizophrenia. Social cognition consists of several skills allowing us to interact with other humans. Overall, we can say that social cognition is a multifaceted construct that broadly refers to the mental operations underlying social interactions, including perceiving, interpreting, and generating responses to the intentions, dispositions and behaviors of others (Penn et al., 2008). Social cognition is typically broken down into 4 domains: emotion processing, social perception/social knowledge, attributional style and mentalizing (Kalin et al., 2015).

- Social perception and knowledge involve the capacity to recognize roles and rules, or nonverbal behavior patterns (body language, prosody, etc) in a certain social context, and it also involves social schemas that are generalized scripts of common social situations with usual roles, rules, and goals.
- Emotion or affect processing is a skill to perceive and use emotions as information. It is usually derived from facial expression of emotions. It requires the identification and discrimination of emotions of others and the management of one's own emotions.
- Attributional style refers to the way in which someone usually explains the causes of social interactions with positive or negative outcomes. Patients with schizophrenia usually display a self-serving or personalizing bias.
- Mentalizing is a key component of social cognition. Mentalizing is the ability to represent mental states of others (beliefs, intentions, desires, emotions) and to make inferences about these states, and hence to predict behavior. Mentalizing is sometimes interchangeably used with theory of mind (ToM), although some authors argue against this (Fekete K et al., 2020). ToM is usually used for the cognitive attribution of mental states, while mentalizing refers to a more complex process-like phenomenon between the self and the other, which also includes cognitive and affective components. In this thesis we generally use the term mentalizing, except from when the narrower meaning of ToM is used in the actual Short Story Task study.

A great number of studies confirmed the presence of widespread deficits in social cognition in schizophrenia. The most frequently studied domains are emotion processing and mentalizing (Green, et al., 2019). Impairments with large effect sizes in mentalizing (Hedges' $g=0.96$) and in emotion processing (Hedges' $g=0.88$) (Savla et al., 2013) have been reported in over 50 studies. A smaller number of studies investigated social perception, finding impairment with large effect sizes (Hedges' $g=1.04$) (Savla et al., 2013). A recent study decided to explore the sub-components as well as the interindividual variation of the deficits of social perception and knowledge instead of focusing on their overall assessment. Bin Kitoko et al. confirmed the existence and the heterogeneity of deficits in social perception and knowledge among patients of schizophrenia emphasizing the individuality in rehabilitation and treatment. (Bin Kitoko et al. 2020). Literature is very limited on attributional style, and the findings are mixed with some of the studies having found differences compared to healthy controls, while others have not been able to replicate these findings (Healey, 2016). A meta-analytic study also failed to detect significant differences in attributional style (Savla et al., 2013).

There is also growing evidence that social cognitive deficits constitute as a core feature of schizophrenia this being especially true for mentalizing, emotion processing and social perception as they are conceived as separate and primary impairments, and not a secondary to the medication or the positive symptoms of schizophrenia (Green et al., 2019).

Recent schizophrenia studies looking into the correlation between social cognition and negative symptoms also showed that these two domains were separate, and that high levels of social cognition and low levels of negative symptoms resulted in more positive social functioning outcomes (Bell et al., 2013). Although they are separate it also means that patients suffering from schizophrenia experience social cognitive deficits as well as negative symptoms both contributing to their social dysfunction. Social cognitive deficits can be detected consequently across the different phases of the disorder. They can be observed in the prodromal phase or in high-risk subjects, they are also present in first episode psychosis, and also throughout the course of the illness (Healey et al., 2016). These deficits can be also detected – usually with an attenuated severity - in unaffected first-degree relatives (Green, et al., 2019).

These results suggest that social cognitive deficits in schizophrenia fulfill the criteria for being considered an endophenotype. The studying endophenotype is a promising field of schizophrenia research (Gottesman and Gould, 2003), intending to identify intermediate phenotypes, which are close to the biological essence of the disease, and which would fill the gap between the genes, responsible for the development of the disease, and the clinical symptoms (Hajnal et al., 2014, 2016). According to Gottesman & Gould (Gottesman and Gould, 2003): (1) The endophenotype is associated with illness in the population; (2) the endophenotype is heritable; (3) the endophenotype is primarily state-independent; (4) within families, endophenotype and illness co-segregate, and (5) the endophenotype found in affected family members is found in non-affected family members at a higher rate than in the general population.

The research of social cognition expanded significantly in the past decade when several studies concluded not having found strong enough evidence to base neurocognitive dysfunctions on potential endophenotypes of schizophrenia. Neurocognitive dysfunctions showed high variability, and they have not proved to be sensitive and specific enough to be considered as endophenotype in schizophrenia (Kéri and Janka, 2004). Similar conclusions have been drawn when searching for (neurocognitive) endophenotypes in patients suffering from bipolar disorder (Berecz and Tényi, 2016).

Deficits in social cognition and metacognition in patients with schizophrenia make it difficult for them to understand the speech, facial expressions hence emotion and intention of others, as well as allowing them little insight into their own mental states. Patients with schizophrenia generate less mental-state language to describe test stimuli depicting intentionality. Recent study by Langdon et al. confirmed that intentionality can be directly perceived in patients with schizophrenia and it is independent of attributions or inferences, while the process of eliciting spontaneous attributions of intentionality is disrupted severely affecting ToM reasoning (Langdon et al. 2020). These above mentioned deficits are associated with poor social skills, fewer social relationships, and they are predictive of poorer performance in a work setting (Lysaker et al., 2014). Numerous researches show that there is a consistent relationship between social cognition and social functioning outcomes (Mancuso et al., 2011). Recent meta-analysis concluded that social cognition was more strongly associated with community functioning than neurocognition,

with the strongest associations being between theory of mind and functional outcomes (Fett et al., 2011).

Attempting to treat the deficits in social competence has been a long-standing battle and social cognition has emerged most recently as a high priority topic for future exploration. Results on social cognition warranted further effort in order to develop new, more advantageous tests for assessment, and also new treatment approaches of treating these deficits. Social cognition seems to be a significant determinant of functional outcome and could be used as a guide to elaborate new pharmacological and psychological treatments (Billeke and Aboitiz, 2013).

4. Social competence in schizophrenia

Social competence refers to performative skills that involve social problem solving in everyday situations, and it is also the ability to achieve affiliation goals (Lieberman, et al., 1986). Social skills are indispensable key elements to social performance. According to Dickinson they include the aspects of communication and sending skills; the verbal and non-verbal communication skills that allow successful execution of interpersonal interactions (Dickinson et al., 2007). People with schizophrenia lack these skills because they either have not learned them or they have lost them in the course of their severe mental illness. The deficits in core social skills exist and show up in various forms, such as inappropriate style of social interaction, lack of spontaneity, missing clarity in conversation, or inept interaction and relationship with others.

There are several important components of social competence (Rus-Calafell, et al., 2014). Responding and sending skills refers to nonverbal (e.g. eye contact, gestures, prosody, etc.) and verbal communication skills (e.g. finding appropriate communication styles, the ability to distinguish between passive, or aggressive styles, etc). Affiliative skills are important in family and friend relationships, as they represent the capacity to form and maintain social and emotional bonds with others. Instrumental role skills are also important in performing or practicing certain instrumental abilities (e.g. asking information, advice, etc.). Interactional skills are about initiating, maintaining, and terminating a conversation. Social competence also requires to be familiar with social norms of community living.

The summary of the components of social functioning including social cognition and competence can be seen in Figure 1.

The efficient modification of social functioning seems to be a central element in successful rehabilitation of persons with schizophrenia. Many evidence-based psychosocial treatments for schizophrenia may influence social cognition, even if they do not directly target social cognition. For example, cognitive remediation usually aims to address impairment in basic neurocognitive skills, but it may also indirectly improve social cognition or functioning and other aspects of functional outcome (Kurtz et al., 2015).

Current interventions targeting social functioning can be divided into treatments addressing social cognition or social skills. The focus of social cognition remediation is on the cognitive elements of social functioning, while social skills training helps individuals to acquire and practice specific behavioral skills in social interactions, however it usually does not force patients to recognize, monitor, and practice skills necessary for social cognitive processes (Kurtz et al., 2015).

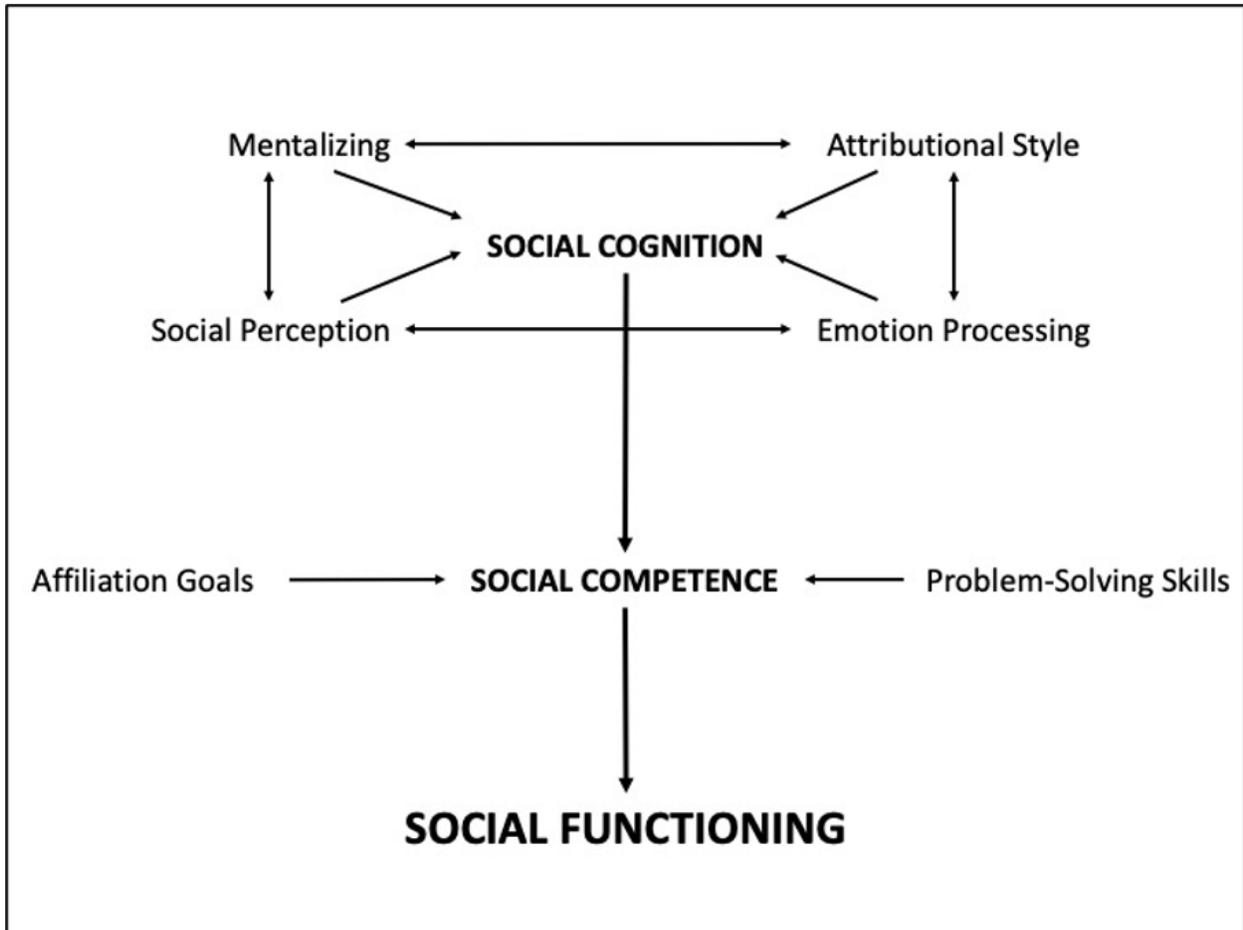


Figure 1.

5. Remediation of social cognitive deficits in schizophrenia

Although deficits in social cognition significantly influence the community functioning in schizophrenia (Fett et al., 2011), the mainstream pharmacological treatment of the disorder has no or only minimal effect on social cognitive impairments. Kucharska-Pietura and Mortimer (2013) found no evidence of positive or negative effect of antipsychotics on social cognition in schizophrenia. A recent review of pharmacological intervention revealed an increasing research activity with a shifting emphasis from antipsychotics to other compounds (hypothalamic hormones, amphetamines, sex hormones, etc.), however still there is no clear evidence for an effective pharmacological treatment in schizophrenia (Fernández-Sotos et al., 2018). The scant effectiveness of pharmacological treatments generated a massive interest in developing effective psychosocial treatments targeting social cognition. This increasing interest was confirmed in a recent systematic mapping review, that found 241 publications between 2006-2016 dealing with psychosocial intervention targeting social cognition (Fernández-Sotos et al., 2019). Most of the studies represent a high level of evidence (106 studies were classified as having 1B level of evidence. 1B: derived from at least one randomized trial), and they were published in journals with high impact factor, which is an indicator of the quality of research in social cognition. Most of the studies targeted mentalizing and emotional processing. Relatively few studies investigated social perception, and even less attributional style.

The social cognitive remediation interventions can be classified as targeted, comprehensive or broad-based (Fiszdon and Reddy, 2012). Targeted interventions aim to improve a single social cognitive dimension (e.g. mentalizing or social perception). The comprehensive approach focuses concurrently on more than one social cognitive domains within a single treatment modality (e.g. Social Cognition and Interaction Training targets emotional perception, mentalizing and attributional style). The broad-based interventions combine the training of the social cognitive domains with other psychosocial treatments (e.g. basic neurocognitive remediation). However, these three categories are not always exclusive, occasionally there may be overlaps between the treatment approaches.

According to the meta-analyses and systematic reviews all three types of interventions are equally effective (Fiszdon and Reddy, 2012; Kurtz et al., 2016, Grant et al., 2017) with the targeted and comprehensive interventions leading to significant improvements in the domains of social cognition. The most robust effect can be detected in emotional processing, which is followed by mentalizing. In case of emotional processing the effect size was medium to large, while a moderate effect size was reported for mentalizing (Kurtz and Richardson, 2012, Kurtz et al., 2016). Surprisingly only little or no effects were detected in social perception and attributional style (Kurtz and Richardson, 2012, Kurtz et al., 2016; Grant et al., 2017). Targeted and comprehensive interventions had similar effect on the outcome (Grant et al., 2017). The studies reporting results on functioning found positive effects. The majority of the publications revealed an association between improving mentalizing and better functional outcome, which in turn suggests that mentalizing may have a more direct effect on everyday functionality compared to the other domains of social cognition (Grant et al., 2017). It suits the notion that mentalizing is the key element of social cognition that has a strong relationship with social interactions, communication, social reasoning and pragmatic language usage (Grant et al., 2017).

Broad-based interventions frequently missed out in reviews of social cognitive treatments (e.g. Kurtz et al., 2016; Grant et al., 2017). Reliable data is also scant regarding broad-based interventions, supposedly due to the great heterogeneity of interventions, and the rarely replicated findings. Perhaps the most complex approach is represented by the Integrated Psychological Therapy (IPT). IPT is a well-documented and efficient rehabilitation intervention in schizophrenia with an assumption that basic deficits (e.g. in neurocognition) determine the higher-level functionality (e.g. social functionality) (Roder et al., 2011). IPT has 5 subprograms, and one is aimed to improve social cognition. Patients treated with IPT showed significant improvement in social cognition and psychosocial functioning (Roder et al., 2011). Trials of other comparable broad-based interventions such as Cognitive Enhancement Therapy (CET) or Neurocognitive Enhancement Therapy (NET) showed similar results (Fiszdon and Reddy, 2012). Although these types of interventions usually turn out to be effective, they are difficult to compare to other treatments because of their multifaceted nature, and usually it is impossible to calculate which treatment component led to what kind of outcome (Fiszdon and Reddy, 2012).

Finally, it should be mentioned that psychosocial interventions not specifically targeting social cognition (e.g. social skills training) may also exert a positive impact on social cognition (Fernández-Sotos et al., 2019). Even psychosocial interventions supporting the richness of interpersonal networks and social support may contribute to the improvement of social cognition (Varga et al., 2018).

Although social cognitive interventions are promising tools in the treatment of schizophrenia, the meta-analyses and reviews consequently agree that much work still remains (e.g. Grant et al., 2017, Fiszdon and Reddy, 2012). They emphasize the necessity of improving the effects on the different social cognitive domains, but demonstrating the durability of treatment effects, the generalization to social functioning outcomes, and the dissemination of interventions are also an important issue.

6. Narrative review on efficacy studies of social skill training for patients with schizophrenia

Among the psychosocial interventions, social skills training has probably the longest history. Current literature that deals with social skills training conducted among schizophrenia patients indicates that topographical features (e.g. eye-contact, hand gestures, speech fluency, etc.) and self-reports of discomfort and anxiety could significantly be influenced and changed for the better through the use of social skills training (Wallace et al., 1980). Social Skills Training is frequently suggested for people living with schizophrenia in treatment guidelines for schizophrenia (e.g. Galletly et al., 2016; Norman et al., 2017). Yet the efficacy of social skills training is still uncertain in light of the growing body of research data on social cognition and functioning. Generalization and duration of the positive effects remain an important issue as these changes do not necessarily occur for every single patient and when they do occur, quite often they do not generalize to other, new situations (Wallace et al., 1980). A few studies have evaluated the effects of the training on the patient's internal states and assessed in terms of self-reports or social competence in social situations, while others used standardized role play situations and variables such as duration, eye contact, response latency, length of interaction have been measured (Wallace et al., 1980). Data is also limited on evaluation of social skills training in terms of effectiveness in social situations in terms of goals and also a few studies evaluated the effects of the training from others perspective and opinions about the patients (outside responses and measurements to the patients).

The purpose of this part of the thesis is first to review the various definitions, methods and evaluation measures of social skills training, then to review and update literature from the past four decades as these studies- with the change of the century- progressively decreased to give way to other types of modalities. It is also an important aim to summarize those existing studies dealing with the efficacy of social skills training for schizophrenia patients that focused and explored the effects of generalization and documented follow-up examinations regarding these effects.

6.1. Social skills training

Given the key role of effective communication in obtaining one's needs for normal social functioning, the ability to interact with others in everyday life situations in order to achieve

legitimate goals is essential. This ability is reflected by our social skills, which represent behaviors that enable us to have success in our everyday lives. The common basis for all definitions of social skills training is an interpersonal context consisting of the patient, who is the focus of the definition and at least one other person (Kopelowicz et al., 2006). It should be pointed out that social skills training programs' basic aim is to address deficiencies in social competence in order to reach successful social functioning for patients suffering schizophrenia. However, it can also indirectly affect social cognition. There are four major elements of most definitions of social skills: (I) internal state of the patient, (II) topography of patient's behaviors, (III) outcome reflected in the achievement of goals, and (IV) the outcome reflected in the feelings, attitudes, behaviors of the other participants(s) (Wallace et al., 1980).

R. P. Liberman defines social skills in terms of internal states and topography: "*the ability to express feelings or to communicate desires and interests towards others*" (Cited in Segrin and Givertz, 2003, p 136.)

According to Hersen and Bellack social skills: "*[is an ability to] express both negative and positive feelings in the interpersonal context without suffering consequent loss of social reinforcement. Such skill is demonstrated in a large variety of interpersonal contexts and involves the coordinated delivery of appropriate verbal and non-verbal responses....an overriding factor is effectiveness of behavior in social interactions.*" (Cited in Segrin and Givertz, 2003, p 136.)

Trower, Argyle, Bryant define social skills as the ability to: "*understand other people's use of elements of expression...convey impressions through appropriate verbal and non-verbal behaviors...ability to affect behaviors and feelings of others in ways the person intends, and which are socially acceptable.... ability to influence the environment sufficiently to attain basic personal goals*" (Cited in Segrin and Givertz, 2003, p 136.).

Guilford defined social skills in terms of several elements of behavioral cognition, while Spivack, Platt and Shure called them "interpersonal cognitive problem-solving skills" (Cited in Rose and LeCroy, 1985).

All these definitions overtly or covertly involve some aspects of social cognition which underlines the difficulties in distinction of social cognition and social skills. However, the distinction is more

clearly reflected in the method of social skills training, as it usually addresses the behavioral aspect of social functioning.

Social skills training is a broad-based program designed to teach a wide variety of social skills. During the 1970s social skills training emerged as an educational and clinical modality for improving social behavior or performance of people with mental disability. Social skills training, a psychological approach, utilizes a number of behavioral principles and techniques - which is why it is sometimes referred to as behavioral skills therapy -, such as problem-solving, role play, modeling, direct instruction, coaching, feedback, verbal reinforcements, rehearsal, home assignments (Kopelowicz et al., 2006). Complex social behaviors are broken into smaller sets of behavioral elements so they can be learned easily in a systematic and progressive way through structured training settings. Social skills training aims to help individuals with serious and persistent mental disabilities to "perform those physical, emotional, social, vocational, familial, problem-solving and intellectual skills needed to live, learn and work in the community with the least amount of support from agents of the helping professions" (Harangozó et al., 2004; Liberman, 2008). Social skills training is used to enable individuals to learn specific skills that are missing or that will compensate for the missing ones. These trainings consist of learning various activities utilizing behavioral techniques that enable persons with schizophrenia to acquire interpersonal disease management and independent living skills for improved functioning in order to enhance their quality of lives (Liberman et al., 2001). Robert Paul Liberman- the most prominent proponent of social skills training- designed a systematic skills training program (Social and Independent Living skills, SILS) consisting of eight modules with different topics (e.g. medication management, symptom management, community re-entry, recreation for leisure, basic conversation skills, substance abuse management, friendship and intimacy, workplace fundamentals skills module) with each topic focusing on something relevant to the patient's life (Heinssen et al., 2000, Kopelowicz et al., 2006, Liberman et al., 1985). Bellack also published a practical training manual on social skills (Bellack, 1989).

The basis of social skills training is derived from social learning theory (Bandura, 1978), and operant conditioning (Liberman, 1982) techniques and the principles emphasize the importance of setting clear expectations with specific instructions, coaching through prompts, modeling or vicarious identification, positive feedback or reinforcement for smaller improvements in social

behavior (Wallace et al., 1980). Trainers also give homework assignments to individuals in order to practice the skills acquired during the training at home, community, workplace or other in vivo settings (Kopelowicz et al., 2006, Wong et al., 1993). The skills are to be learned slowly, repetitively and consistently with the help of techniques such as error-free learning, shaping and overlearning (Bellus et al., 1999, Heinssen et al., 2000, Kopelowicz et al., 2006, Silverstein et al., 1999).

Although several treatment guidelines suggest social skill training for schizophrenia (e.g. Buchanan et al. 2010, Galletly et al. 2016, Norman et al. 2017, Scottish Intercollegiate Guidelines Network, 2013), not all of them recommend it routinely (e.g. National Institute for Health and Care Excellence 2014). Beside this, a shift can be detected in literature to social cognition remediation intervention, that can be also detected in decreasing number of publications dealing with social skills training. The problem of generalization and the duration of the positive effects were clear from the very first reviews of social skills training (Wallace et al., 1980), yet the long-term efficacy of social skills training is still uncertain. The main aim of this chapter is to review and update literature of social skills training from the past decades.

6.2. Method

Electronic searches of PUBMED were undertaken looking for the following keywords: "social skills training", " social skills training AND schizophrenia", "effects of social skills training AND schizophrenia", "social skills training OR cognitive social skills training AND schizophrenia", "social skills", "psychosocial functioning", "social cognition", "social competence", "psychiatric rehabilitation", "generalization", "review", "meta-analysis". Additionally, the general search engines on the internet such as Google Scholar were used. Some relevant studies were also searched manually in the Journals. All reference lists of the selected articles were searched for further relevant trials. Review articles were also scanned. Finally, only those articles made it into our research which dealt with empirical studies of social skills training. In order to reduce potential bias in the selection of relevant intervention studies regarding efficacy of social skills training in schizophrenia, only studies conducted with randomized controlled trials or controlled trials were included and were published between 1981 and 2015.

6.3. Results

From the comprehensive search results, in total 25 studies, 10 reviews and meta-analyses were considered as relevant (see the detailed list and the characteristics of the studies in Appendix 1.). Social skills training has the longest history of all psychosocial interventions for schizophrenia and it has been used since the 1960s. Some authors state that the operant conditioning-based token economy is the first used intervention to focus on social behavior of people suffering schizophrenia (Lieberman et al., 2001). These early social skills training strategies for schizophrenia, which are reviewed by Donahoe and Driesenga (Donahoe and Driesenga, 1988) were modifications of assertive training approaches originally developed for individuals with passive and inhibited lifestyles. Outcome was assessed primarily with role play measures of behavioral topography (speech duration and latency, eye contact, gestures) and molar skills (assertiveness, managing compliments). In nearly all of these studies the interventions led to significant improvements in measures of topographical skills (Bellack et al., 1984). In several of these studies maintenance of skills was documented for periods of several weeks to 24 months. Methodological weaknesses included the use of assessment strategies that were similar to the training strategies as well as failure to assess if acquired skills generalize to natural settings. Additionally, documentation regarding the use and duration of antipsychotic medication also lacks clarity and precision.

There was a great rise of social skill training interventions in the 1970s designed and led by R.P. Liberman. He was the first to introduce role-playing, coaching, modeling and problem-solving and designed several modules known as the UCLA Skills Training Modules as part of their psychiatric rehabilitation program (SILS) (Lieberman, 2008). Their approach was based on problem-solving focusing on receiving, processing and sending skills. This study is translated into 23 languages and is used in 6 continents (Lieberman, 2008).

The role of training sustained attention in patients with poor social skills was the 1990s' main focus. According to their findings training sustained attention can lead to better learning capability for basic conversation skills through repetition. Also in the 90's Brenner came up with the Integrated Psychological Therapy (IPT) as a significant approach for the cognitive model (Roder et al., 2006), Hogarty and Flesher (Hogarty and Flesher, 1999) created the Cognitive Enhancement

Therapy (CET) – both of which are great examples of the training of social and neurocognitive abilities associated with social skill trainings (Kopelowicz et al., 2006).

According to the search results, the included studies were either randomized controlled trials or controlled trials though some of them were smaller sample size trials. The implemented social skills training interventions were either in traditional format (conversational skills, assertive skills, independent living skills, interpersonal relationship skills etc.) or in cognitive format (cognitive behavioral therapy, attention training, neurocognitive training, cognitive remediation). In most of these studies group sessions included small groups of 5-8 participants. The duration of sessions ranged from 45 to 70 minutes with a frequency ranging from once a week with up to three sessions per week for a period of minimum of 4-8 weeks with mostly male participants with schizophrenia diagnosis.

Results of studies consistently showed that social skills training were effective especially in terms of skill acquisition and performance of skills taught in class or in clinical settings (Lieberman, 2008). Additionally, several findings indicated significant levels of positive generalization of skills and improvement in social adjustment and social functioning (Heinssen et al., 2000, Kopelowicz et al., 2006). Some of the results suggest particular skill improvements such as conversation and problem-solving skills, assertiveness and some studies reported reduced negative symptoms (e.g. social isolation, lack of motivation, apathy and loss of enjoyment) not to mention the increased levels of self-esteem participants in the experimental groups reported after the trainings (Bellack et al., 1990, Liberman et al., 2002).

However, social skills training improves social skills but has no clear effects on rehospitalization and relapse (Kopelowicz et al., 2006). Although most of the reviews agree in the effectivity of social skills training (Wallace et al., 1980; Heinssen et al., 2000; Bellack, 2004; Kopelowicz et al., 2006; Liberman, 2008; Tan et al., 2018), reviews also underline that results are disappointing for transferring skills to everyday life (Kopelowicz et al., 2006). They also emphasize that generalization techniques are usually missing from training procedures (e.g. creating opportunities in the living environment to practice the learned skills) (Kopelowicz et al., 2006). It is also a frequent opinion that the effect of social skills training might be potentiated with incorporating cognitive remediation interventions. This viewpoint is supported by the results of the new

approaches that embed social skills training into a more complex intervention repertoire (Tan et al., 2018). IPT and CET are the most prominent examples of this technique. Both interventions focus on neurocognitive and social cognitive deficits beside training social skills (Roder et al., 2006; Hogarty and Flesher, 1999), and both interventions had promising results (Kopelowicz et al., 2006; Tan et al., 2018).

Although most of the reviewed studies and reviews showed promising results, the 7 meta-analyses we looked at showed inconclusive results on the efficacy of social skills training.

In their meta-analysis by Benton and Schroeder concluded that while the benefits of social skills training are stronger for improvements in social skills and social functioning, significant effects were identified for symptom improvement, acceleration of discharge from the hospital and reduced relapse rates (Benton and Schroeder, 1990). Corrigan (Corrigan, 1991) after having analyzed 72 studies came to the conclusion that the results supported the efficacy of social skills training for improving psychosocial functioning in schizophrenia. The patients broadened their skills, and the benefits were maintained for several months. However, the strength of both meta-analyses is lessened by the low rigor of selection as they included quasi experimental trials also. In contrast, Pilling et al. published a meta-analysis including 9 randomized controlled trials and concluded that social skills training and cognitive rehabilitation do not seem to provide clear benefits for patients with schizophrenia (Pilling et al., 2002a).

Dilk and Bond in their meta-analysis reported large effect size for assertiveness and interpersonal skills, and a much smaller effect size for instrumental role functioning and independent living (Dilk and Bond, 1996). The weeks of training correlated significantly with effect size and clinical outcome. They also found that studies rarely examined the acquired skills in real world settings.

In their umbrella review of psychological therapies, Pfammatter, Junghan and Brenner (Pfammatter et al., 2006) analyzed the efficacy of social skills training by 19 RCTs, and they found that social skills training consistently influences the acquisition of social skills, assertiveness, modestly social functioning, and slightly general psychopathology. However, they found questionable how these benefits can be transferred to general social adjustment and role fulfillment.

An important meta-analysis of 22 RCTs from 2008 by Kurtz & Mueser (Kurtz and Mueser, 2008) revealed that social skills training has a large effect on proximal measures (e.g. learned behavioral elements, such as role plays taken directly from skills-training material), but moderate on social and daily living skills, community functioning, and negative symptoms, and a small effect size on other symptoms and relapse.

The latest Cochrane (Almerie et al., 2015) meta-analysis reviewed 17 reports describing 13 RCTs and found low quality or very low quality evidences that rates of relapse, quality of life, social functioning measures, rehospitalization favored social skills trainings over standard care protocols, however, when compared to a discussion group control, no significant differences were found in social functioning, relapse rates, quality of life and mental state.

Overall it has been stated by all 7 studies, that further open questions remained as to the generalization of findings to psychiatric care and there is still room for improvement in order to expand the effect of mentioned intervention to improve clinical outcomes in the long run. Despite some evidence that trained skills can be maintained over time, relatively few studies have addressed the issue of long-term treatment outcome (Heinssen et al., 2000).

6.4. Conclusions

This narrative review describes current researches on psychosocial skills training methods for schizophrenia. For over 4 decades, research data demonstrated the efficacy and usefulness of social skills training interventions for patients with schizophrenia. Most of the studies confirmed that social skills can be trained, and it has a significant impact on social functioning. So generally it can be said, that there is no indication that these kinds of social skills training interventions do any harm therefore could be implemented in routine psychiatric care combined with antipsychotic medication and other psychosocial therapies such as family psychoeducation (Almerie et al., 2015). Overall - compared to standard care - more research supports the efficacy of social skills training for schizophrenia and other serious and persistent mental disorders with good results in terms of quality of life, mental state and social functioning, however the evidence is still very limited with data rated as low quality (Almerie et al., 2015). According to the low level of evidence, the available Cochrane review suggests for clinicians that social skills training should be thought of as experimental (Almerie et al., 2015). Another meta-analysis, conducted by Pilling

et al. (Pilling et al., 2002), concluded that social skills training do not seem to provide solid and clear benefits for patients with schizophrenia. Still, most meta-analyses emphasize the benefits of social skills training. There is some evidence that skills training leads to skill acquisition and maintenance in schizophrenia, especially if it is intensive and of sufficient duration. There is also evidence that those programs that add other psychosocial approaches to the drug treatment are more effective in reducing relapses and improving social functioning.

Although recently research activity is not so strong as most of the studies came from the 90s or early 2000s, still data supporting the effectiveness of social skills training methods continue to accumulate, however, more reliable evidence is needed if social skills training interventions are to be incorporated into the treatment of patients with schizophrenia. These programs introducing and implementing skills training methods should remain since findings considered in this review show where and how these interventions can be applied to improve functioning for schizophrenia patients, however, cautious optimism is warranted regarding future directions and development of these implementations as important questions are not answered (such as generalization or motivational problems).

The moderate results could be due to the deficits in methodology as they all try to measure various components of the very complex human behavior, hence the study of social skills training generalization is so arduous. Whatever patients learn in group settings do not necessarily and always transform into real life “in vivo” settings and even if they do, it is rather difficult to measure these occurrences during follow ups. There are several other potential explanations for the less than satisfactory generalization of social skills training to real life situations such as the longevity and duration of the training which is often less than 20 hours, and this is rather brief and may offer too little practice to firmly establish skills (Wallace et al., 1980). Further research could focus more on where spontaneous generalization occurs and why and where it does not. Additionally, certain methodological flaws occur in a lot of these studies such as unspecified psychopathology, lack of description of the patients, no control of medication, various durations, heterogeneity of diagnostic practices in terms of included illnesses etc. (Wallace et al., 1980). These practices make it extremely difficult to compare studies and resolve contradictory findings.

Although there is moderate evidence for generalization of learned skills to overall social adjustment, highly focused approaches that target narrowly defined skill areas are more likely to lead to generalization than strategies that teach generic social skills such as assertiveness therefore generalization of findings should be done with caution. Further research must be directed to determining the interaction between the patient characteristics and training procedures as they affect outcome. Additionally, several studies showed that in vivo social skills training is more effective than conventional analogue skills training, however the implementation of these techniques alone carry many challenges as these procedures occurred primarily in closed settings where mental health professionals provide services (Lieberman, 2008, Liberman et al., 2002, Wong et al., 1993).

Another important topic is the enhancement of efficacy of social skills training with other psychosocial interventions, such as neurocognitive or social cognitive remediation. More and more data support the synergistic effects of social skills training and remediation.

To sum it up, despite decades of research there is an ongoing debate about whether social skills training is effective or not in improving social functioning. Narrative reviews tend to interpret data more positively while meta-analyses are more likely to question the effect on social functioning. Data shows that primarily the impact is strongest on the most proximal domains to the intervention, and weakest on the most distal domains (Kurtz and Mueser, 2008), and perhaps this is the cause of the discouraging results in transferring the improvement into everyday life.

7. “State of the art” of interventions targeting social functioning

A great body of evidence confirmed that improving social functioning is a key element in treating patients living with schizophrenia (Green et al., 2019). Social functioning (especially the quantity and quality of social activities, the real involvement in social activities, the interpersonal network) a key outcome measure of treatment success (Bruns and Patrick, 2007). Social functioning is a valuable indicator of long-term outcome, and it can be an important treatment target in schizophrenia.

Social skills training has a decades-long history in targeting the deficits of social functioning, however generalizability and transferability of the improvements in certain behavioral elements are still uncertain. On the other hand, research data suggest that cognitive and social cognitive factors could explain a significant variance in social skills (Pinkham, 2014). Neurocognitive capacity explains the 15%, social cognition explains the 26% of the variance (Pinkham and Penn, 2006). Social cognition is increasingly viewed as a viable treatment target. This is in large part due to a growing body of evidence demonstrating that social cognitive abilities contribute to real-world outcomes and that remediation of social cognitive impairments leads to improvements in functional outcomes (Pinkham and Harvey, 2013). Although these results were published in high quality journals, and the results were found to represent high level evidence (Fernández-Sotos et al., 2019), most of the reviews and meta-analyses came to the conclusion that the evidence quality is limited and the methodology is modest (Grant et al, 2017, Fiszdon and Reddy, 2012). The generalizability and transferability to real world functioning is also a problem in social cognitive remediation. So, enhancing the transfer of improvements in social cognition into real life functioning is an important focus of research in schizophrenia.

The dissemination of psychosocial interventions is also an important issue (Wykes, 2016). The dissemination and adaptation of the interventions is rather slow (Chien et al., 2013). The utilization of psychosocial interventions is minimal at the level of practicing clinicians (Drake et al., 2009).

However, the difficulty lies not only in treatment, but also in measurement. Measurement of social cognition is problematic not just in treatment trials, but in recognition also, usually due to poor

and limited psychometric data (Pinkham et al., 2016). Social cognition is important in the whole course of the disorder, but particularly significant in the early phase of schizophrenia. The early phase of the disorder constitutes a critical intervention window, and early recognition and treatment of social cognitive deficits may alter significantly the course of the disorder. So, research focusing on early intervention strategies for high-risk individuals, and on treatment to first-episode patients is critical for a better outcome of the disorder (Velthorst et al., 2017).

Taking everything together, the state of the art of interventions targeting social functioning suggests that new ways of measurement and treatment for social cognitive deficits that can be applied easily in everyday clinical situations are an important challenge in treatment of patients with serious mental disorders.

8. Reading literary fiction and its effects on mentalizing

In order to be successful in society, the ability to recognize, assess the mental state of other people and then be able to shape our own reactions accordingly is most needed. This is called mentalization, or theory of mind, which is nothing less than an accurate understanding of another person's beliefs, emotions, intentions, which allow for the implementation of appropriate social behavior through the prediction of a future mental state (Dodell-Feder et al., 2013). Improving and developing the ability to mentalize is a long process that accompanies us through our whole lives and it can affect our ability to empathize and affect our prosocial behavior and our place in society. Practice and interpersonal relationships through socialization promote the development of this ability. In a similar way, mentalization can also be improved by imagining interpersonal interactions, for which the influence of literary works can serve as a model. Caring for another person's thoughts and preoccupation can improve the psychological processes that support intersubjective relationships, even if the other person is a fictional, non-existent person in this relationship. A social environment is most conducive to the development of mentalizing ability where there is greater opportunity for interpersonal interactions and there is no need to rigidly adhere to social identity and roles (Kidd and Castano, 2016). Understanding the mental state of others is a fundamental ability that characterizes more complex social relationships, however, little research has examined exactly what supports and develops this ability (Kidd and Castano, 2013).

Reading books, watching movies, plays and opera performances are all activities called fictional narratives, and one of the functions of them is to distract people from their daily routines so that they can break away from their everyday lives (Bal and Veltkamp, 2013). Reading different literary works can expand our knowledge of the lives of others by helping us recognize the similarities between them and us, change how people think about others, and encourage them to be actively involved in the process of mind reading and character building. Fictional literary works are defined as polyphonic by Bakhtin suggesting that the reader actively contributes his or her own voice to this cacophony (Bakhtin, 1984; Kidd and Castano, 2013).

An important finding of modern novel theories is that the fictionality of the novel captures and shows the diverse, contradictory perspectives of the characters. Kundera, whose theory, in our

opinion, is very similar to Bakhtin's, believes that the novel seeks to explore the being (in a Heideggerian sense) by emphasizing two important characteristics that the novel must be able to say something that no other genre would be able to do, precisely by bringing plural perspectives into play and that no one is 100% right in the novel thus in the fiction of the novel the truth emerges in a plural, coexisting panopticon for the reader. According to Adrián Bene: "*Kundera in his work, 'the art of the novel' refers to Husserl and Heidegger by connecting the novel to cognition, to the exploration of existence, whose function -since Cervantes- is to illuminate the world of life and, in line with Bakhtin's idea of dialogue and polyphony, to present basic features such as ambiguity and uncertainty*" (Bene, 2019).

From the perspective of our theoretical research, we can agree with one of Kundera's basic theorems following the wording of Gábor Csanda (Csanda, 1992): "*the only raison d'être of a novel is to say something that only the novel alone can say.*" Another highlight by Csanda from a mentalization research perspective is also important, claiming that according to Kundera, "*editing a novel is like putting different emotional spaces side by side*" because we believe that Kundera's "emotional space" means the different mentalizing perspective of the characters in our terminology.

The lack of an exclusive and distinctive authorial perspective characteristic of works of art compels the reader to engage in a dialogue with the author and the actors. According to Mar et al., reading literary fiction also develops imagination (Mar et al., 2006). According to Bruner, literature and literary works initiate a conversation with the reader, as they force the reader to fill in any gaps in their minds and look for other possible meanings and explanations (Bruner, 1986).

Barthes distinguishes between readable and writable text, in which the former is intended for entertainment and the latter is for creative participation by engaging the reader as a "writer" who "rewrites" the original text with his own reading. (Barthes, 1974).

Kidd and Castano based their dissertation on these theories claiming that literary fiction is a writable and polyphonic text that initiates psychological processes that allow access and insight into the perspective of the characters (Kidd and Castano, 2017). The world of literary fiction, like real life, is full of complicated and complex people, characters whose inner worlds are often not easy to get to know and map out (Bókay, 1997). This world - at the same time - poses less risk to the reader than the real outside world, as it offers the opportunity to live through the experiences of others without threatening consequences. Literary fiction often requires the release of our

expectations, and thus, without stereotypes and conventions, the reader is forced to use her mentalizing skills to understand what is happening (Kidd and Castano, 2013).

In their study, Mar and Oatley emphasize that literary works simulate different social worlds and that literary works have different demands on mentalization processes depending on their genre (Mar and Oatley, 2008). Literary fiction seems more sophisticated in creating a simulative experience that may stimulate the understanding of others in terms of intentions, desires, beliefs and emotions (Mar and Oatley, 2008). Moreover, brain regions responsible for story processing usually overlap with core mentalizing networks (Mar, 2011). Recently, observation and imitation of social emotions have been found to be essential for improving cognitive and affective mentalizing using computerized cognitive training (Yeh et al., 2019), or a specialized emotion and mentalizing imitation training (Pino et al., 2015). Literary fiction can be conceived as an opportunity for such an observation and imitation as it requires the reader to be engaged in a simulated social experience by being immersed in the mental and social life of the fictional characters (Dodell-Feder et al., 2013; Mar and Oatley, 2008).

9. Persons with Schizophrenia Misread Hemingway: a new approach to study Theory of Mind in schizophrenia

9.1. Introduction

According to the reasoning in the previous chapter, literature, especially literary fiction, is an excellent way of practicing ToM, since it is characterized by using narrative content that prompts the reader to guess rather complex social situations, where the motivation of the characters and/or the causality of the events are not described directly or explicitly. The narrative comprehension of these scenarios usually requires the use of ToM skills, because the reader is required to make mental state inferences to understand the events and the characters' intentions. An interesting approach has been published recently that suggested literary fiction as a potential tool to assess ToM performance and they used a short story to assess ToM skills (Short Story Task, SST) (Dodell-Feder et al., 2013).

ToM is the ability to attribute mental states (such as beliefs, knowledge, intentions, emotions) to the self and others, and hence it allows to explain and predict behavior (Frith and Frith, 1999; Premack and Woodruff, 1978) while being a key component of social cognition. ToM has two major components: its implicit and its explicit form. Implicit ToM is automatic, fast, decoded without awareness, non-verbal, and so it is an intuitive mental state attribution (Vogeley, 2017). The implicit ToM is present in the early life, possibly from birth (Apperly and Butterfill, 2009; Schneider et al., 2014). Explicit ToM, in contrast, is relatively slow, relying on verbal processing, more controlled and conscious, deliberative, and inferential (Langdon et al., 2017; Vogeley, 2017). Compared to implicit ToM, explicit ToM develops later, and is closely tied to language acquisition and executive function development (Apperly and Butterfill, 2009). Explicit ToM is usually measured by tasks relying heavily on verbal abilities and they usually contain explicit instructions for attributing mental states (Bell et al., 2010). The term, spontaneous ToM is also used in social cognitive research. Spontaneous ToM is the processing of social information without explicit instruction (Senju, 2013). The concept of spontaneous ToM overlaps with the implicit ToM, however according to Senju (Senju, 2013), spontaneous ToM does not require the lack of conscious awareness. It is also not an obligatory process unlike automatic processing, so it can be

interrupted by competing cognitive tasks (Senju, 2013). It can be conceived as a lower level and early phase ToM processing with an emphasis on mental state decoding (Vogeley, 2017). Usually the spontaneous ToM activity is tested with animated geometric forms stimuli, and measured by multiple choice questions (Bell et al., 2010; Johannesen et al., 2018; Lee et al., 2018), or with questions not directly asking the subject to reflect upon mental states (Langdon et al., 2017). These types of ToM tasks are also used as indirect measures of verbal mental state attribution indexed by the spontaneous use of mental-state language (Langdon et al., 2017) (e.g. feels, thinks, wonders, furious, anxious, etc.) in tasks when the participants are not cued (unlike in explicit ToM tasks), and responses are spontaneous (Dodell-Feder et al., 2013; Langdon et al., 2017).

The concept behind the idea to use literary fiction as an assessment tool was to make a test sensitive to spontaneous and explicit ToM as well as to small individual differences so that the ceiling effect could not be detected. Ceiling effect, when participants perform near perfectly, is quite frequent in ToM research. They also considered it important to include a range of complexity tasks in order to use a social situation similar to reality and to be easily and quickly recruited and evaluated. Literary fiction is very similar to everyday situations: it is about a dynamically developing, complicated, lifelike social situation, where the understanding of the mental aspects is essential for the comprehension of the entire story. In order for the reader to interpret the story, one must draw conclusions about the thoughts, emotions and intentions of the characters just as in everyday situations (Dodell-Feder et al., 2013).

A substantial body of evidence suggests that persons with schizophrenia are impaired in their abilities to attribute mental states to others (Bora et al., 2009; Martin et al., 2013; Sprong et al., 2007). Research results confirmed that ToM impairment does not only exist during acute episodes as a state variable, but it is also constantly present between the episodes as trait-marker (Bora et al., 2009). ToM deficits in schizophrenia could be conceived as a phenotypic impairment (Martin et al., 2013; Tikka et al., 2019), it precedes the onset of the disorder, and it is not only present in the acute psychotic states, but also during remission (Martin et al., 2013). High-risk individuals show lower ToM performance with blunted trajectory from age 17 onward (Davidson et al., 2018). It can be also detected in nonaffected relatives with genetic risk, they usually have intermediate performance between persons with schizophrenia and healthy controls (Herold et al., 2018; Martin

et al., 2013). Genetic associations with ToM deficits were also revealed during the last decade (Martin et al., 2013). According to literary data, the resulting ToM deficit is independent of age and gender (Sprong et al., 2007) and – although not specifically addressed so far – an association of ToM impairment with medication seems at least unlikely (Kucharska-Pietura and Mortimer, 2013). Cross cultural studies also revealed that ToM impairment in schizophrenia is present across cultures (Lee et al., 2018; Song et al., 2015). It is also assumed that not only the understanding of others is impaired, but patients also have a disturbed capacity to relate their own intentions to executing behavior, and to monitor others' intentions (Brüne, 2005).

Most available research studying schizophrenia investigated the explicit ToM skills, which were found extensively deficient. Relatively few studies focused on implicit and spontaneous ToM. Roux et al found (Roux et al., 2016b) preserved implicit mental-state attribution measured by eye-tracking, whereas explicit performance was impaired, however, they also detected slowdown of social context processing during intention attribution with a similar paradigm (Roux et al., 2016a). Other investigations - which used animated geometric forms stimuli - found deficient spontaneous ToM skills characterized with incorrect social inferences in schizophrenia (Bell et al., 2010; Johannesen et al., 2018; Lee et al., 2018; J Ventura et al., 2015). Other studies with animated geometric forms reported fewer patient generated mental-state terms (Horan et al., 2008; Langdon et al., 2017; Russell et al., 2006). The reduced unprompted mention of mental states reflected a relative insensitivity to salience of mental state information.

There is a strong link between social cognition, functional outcomes and quality of life (Fett et al., 2011; Tas et al., 2013). In schizophrenia, ToM deficits are difficult to overcome and improve, while adequate social cognitive abilities are indispensable for proper social functioning. In light of the importance of social intelligence including mental state attribution skills in human evolution, it seems straightforward to assign mental state attribution a specific role in social functioning (Brüne and Schaub, 2012).

In the past decades, numerous tests have been developed to measure ToM. Overall it can be stated, that there are so many tests and methods, which successfully examine and measure ToM, that it would go beyond the scope of this article to give a fully detailed listing on them. The different methods were reviewed excellently in several publications (for detailed review see (Baron-Cohen, 2000; Dodell-Feder et al., 2013; Turner and Felisberti, 2017)). These measures and other methods

of analysis usually clearly distinguish persons with autism, bipolar disorder, schizophrenia, etc. from the healthy population based on their marked ToM deficits. Most of these tasks, however, were primarily developed for children and may not be challenging enough to assess adults. These tests could often only detect serious impairments, and the tiny individual differences – even among healthy individuals – would remain hidden. The additional disadvantage of these methods is that members of the healthy control groups often perform 100% or nearly 100% so ceiling effect can be detected. Ceiling effect is a common phenomenon in ToM research in schizophrenia as well, when healthy controls are involved in a study, as they usually perform above 90% in several studies (Dodell-Feder et al., 2013; Turner and Felisberti, 2017). Even early detection of the slightest deficit could, however, significantly advance preventive and diagnostic activities. Unaffected first-degree relatives or individuals with high-risk state for psychosis usually exhibit milder forms of ToM impairments (Bora and Pantelis, 2013), but even persons with schizophrenia exhibit varying degrees of ToM deficits (Brüne and Schaub, 2012).

Additionally, the greater part of ToM studies are limited to studying explicit ToM so the participant is instructed to make ToM references. In these tests, spontaneous ToM, where the participant is not specifically instructed to make references for mental states, is usually ignored (Dodell-Feder et al., 2013), however recent studies addressing spontaneous ToM have been emerging ((Bell et al., 2010; Horan et al., 2008; Johannesen et al., 2018; Langdon et al., 2017; Lee et al., 2018; Russell et al., 2006; J. Ventura et al., 2015)).

The main purpose of this study was to test the applicability of the new SST (Dodell-Feder et al., 2013) to measure the ToM skills of persons with schizophrenia. It was hypothesized that significant differences would be detected in the explicit ToM scores between the persons with schizophrenia and the control group participants. We also presumed that there would be significantly more spontaneous ToM references among healthy subjects than among patients. We also hypothesized that there would be no significant differences in the participants' comprehension skills in terms of the short story. Finally, based on the previous results, we did not expect to observe a ceiling effect in mental state reasoning in both groups.

9.2. Material and Methods

9.2.1. Participants

The persons with schizophrenia (schizophrenia group, SG) were recruited from outpatient psychiatric services and from the outpatient units of inpatient psychiatric care from three cities (Pécs, Mohács and Szigetvár) in Hungary. All the patients were treated with the diagnosis of schizophrenia fulfilling the diagnostic criteria of DSM-5. Two experienced, senior psychiatrists reviewed the psychiatric history of the patients to confirm the diagnosis. Diagnosis was also confirmed by Module B and C of SCID-5 (Module B: Psychotic Symptoms, Module C: Differential Diagnosis of Psychotic Disorders) (First et al., 2015). Patients were on maintenance antipsychotic treatment. Patients received first generation antipsychotics (8 persons), second generation antipsychotics (28 persons), or they were on combination treatment with two antipsychotics (11 persons). The chlorpromazine equivalent dose was 371.21mg (SD: 201.62). Inclusion criteria were: age older than 18; being native Hungarian speaker; no evidence of substance abuse (excluding caffeine and tobacco); no neurological disorder or mental retardation or cognitive deficits unrelated to schizophrenia. All the subjects living with schizophrenia were treated as outpatients, there were no changes in the medication of the participants during the study and in the antecedent last 6 months. We intended to assess a clinically stable patient population fulfilling the criteria of remission to minimize the confounding effect of symptoms. According to the remission criteria of schizophrenia (Andreasen et al., 2005), remission was confirmed with the 8 items (P1, P2, P3, N1, N4, N6, G5, G9) of Positive and Negative Syndrome Scale (PANSS), which were mild or less (≤ 3) for at least 6 months before entering the assessment. 62 patients with the diagnosis of schizophrenia in a clinically stable state according to the judgement of their treating psychiatrist were recruited. 15 patients were ruled out, as they were not in remission according to the remission criteria of schizophrenia. The final sample comprised 47 subjects (23 male and 24 female).

The control group (CG) consisted of 48 Hungarian-speaking healthy individuals (19 male and 29 female), enrolled from the general community through online recruitment. Inclusion criteria for the CG were the following: age older than 18; being a native Hungarian speaker; no evidence of substance abuse (excluding caffeine and tobacco); no neurological disorder, no earlier treatment due to psychiatric disorder. CG was also screened with SCID-5 to exclude the presence of a psychiatric disorder. Age, sex, ethnic origin and educational status were matched to the characteristics of the patients' group to minimize interindividual variability.

The psychiatric history review, the assessment of remission, and SCID-5 were carried out by two senior psychiatrists (R. Herold, T. Tényi) trained in SCID-5 and PANSS assessment. The interrater reliability of them was tested in our earlier study for SCID and PANSS, and the kappa coefficient was $>0,75$ (Varga et al., 2019).

After a detailed description of the study was presented to the subjects, written informed consents were obtained. Patients were aware of the study's aims and hypotheses. The investigation was performed according to institutional guidelines. Ethical perspectives were established in accordance with the latest version of the Declaration of Helsinki. The study design was approved by the Committee on Medical Ethics, University of Pécs (ethical permit number: 6539).

9.2.2. Experimental task

For the present investigation, SST was used, previously developed by Dodell-Feder et al. (Dodell-Feder et al., 2013) for ToM investigation in healthy participants. The SST consists of a short story and a Short Story Task Administration and Scoring Materials. This supplementary document involves instructions for the participants, the questions, and scoring instructions. The original English version of the supplementary document can be downloaded from the publishing site (<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0081279>).

The test was adapted to Hungarian (see in Appendix 2.). We translated the instructions, the questions and the evaluation criteria, then a bilingual native speaker was asked to translate it back to English considering the intercultural differences. ToM skills were analyzed through a structured interview after reading the short story. The instructions were modified on the basis of the ex-post recommendations of the US task force. The original study demonstrated that SST is sensitive to variations in ToM performance, it can be rated accurately by different raters, and SST showed convergent validity with other ToM measures (Dodell-Feder et al., 2013).

Participants read a short story, *The End of Something* by Ernest Hemingway, which presented an interaction between a romantic couple, Nick and Marjorie. This particular short story has been chosen for this purpose because the text is easy to understand (Dodell-Feder et al., 2013). We used a published Hungarian translation of the short story (Hemingway, 1987). Throughout the story the couple followed the stages of a breakup however the mental lives of the characters were not

explicitly described so the reader was forced to make mental state inferences by picking up clues from the various nonverbal and indirect communication between the characters.

Before reading the story, the participants were given verbal instructions, then afterwards were asked a series of open-ended questions. They were allowed to refer back to the story as needed to eliminate memory demands. In these instructions, readers were asked to highlight the characters' thoughts, feelings and intentions. The investigator gave no feedback regarding the participant's responses.

The task was presented verbally by one of the investigators in the form of an interview in one session for all participants individually. Each interview was recorded, and the recorded data were scored by two independent investigators (it was done by J. Fekete, and E. Varga,). The interrater reliability was tested, and the kappa coefficient was > 0.90 in the pilot study. According to the original study, scoring was completed by the first author, using the transcripts, then 25% of the transcripts were chosen at random and scored by a second independent rater (Dodell-Feder et al., 2013).

The structured interview of SST involved 14 questions regarding three areas: 5 comprehension questions, 8 explicit mental state reasoning questions, and 1 question to assess spontaneous mental state inference (Dodell-Feder et al., 2013). Comprehension questions were designed to measure the understanding of the non mental state content, while explicit mental state reasoning questions assessed the mental state inferences, and the understanding of non-verbal or indirect communication. To assess spontaneous mental state inference questions, participants were asked only one open-ended question: to summarize the story in their own words. In this particular question responses were coded according to the presence or absence of mental state inference, without drawing special attention to what the question actually measures.

The answers for the questions were scored from 0 to 2 (except from the spontaneous mental state inference question, which is scored from 0 to 1: absence or presence of mental state inference). Zero (0) point was given when the answer was incorrect or when there was no answer. 1 point was given when the response demonstrated partial understanding, when the participant needed questions to clarify or when the participant gave very few examples. 2 points were given when the responses demonstrated full understanding and the experimenter gave more than 2 examples.

9.2.3. Statistical analysis

The IBM Statistical Package for Social Science (SPSS; SPSS Inc., Chicago, IL, USA (Nie et al., 1975)) Statistics version 24 for Windows was used for statistical analysis. In the statistical analysis, as we made multiple comparisons according to Bonferroni correction, $p < 0.01$ was considered significant. We used independent samples t-test, ANCOVA and non-parametric Mann-Whitney U test to calculate the differences between the persons with schizophrenia (SG) and the control group (CG) for clinical and demographic data. We used a Chi-square test to examine gender difference between the two groups. We performed linear regression to assess the effects of demographic data on explicit ToM.

9.3. Results

Demographic data are summarized in Table 1. There was no significant difference in age ($p = 0.942$, not significant, n.s.), years of education ($p = 0.243$, n.s.), and gender ($p = 0.759$).

	Control Group (CG)(n=48)		Schizophrenia Group (SG) (n=47)		p-value
	Mean	S. D.	Mean	S. D.	
Age (year)	43.88	19.38	43.64	11.30	$p = 0.942_a$
Education (years)	12.98	2.43	12.38	2.52	$p = 0.243_a$
Duration of illness (years)			12.46	2.32	

Table 1

Demographic data in the CG and the SG

*aIndependent Samples t-test was used to calculate the differences between the groups
Statistically significant: $p < 0.01$, Bonferroni correction*

Persons with schizophrenia performed - statistically by average - less accurately than control subjects in the comprehension questions, but it was not statistically proven after the Bonferroni correction had been performed ($p=0.050$) (Table 2). In the other two measured factors, namely in the explicit mental state reasoning questions ($p<0.001$), and in the spontaneous mental state inference question ($p<0.001$), the control group achieved significantly higher scores than the persons with schizophrenia (Table 2).

Experimental tasks	Control Group (CG) (n=48)		Schizophrenia Group (SG) (n=47)		p-value
	Mean	S. D.	Mean	S. D.	
Comprehension questions	8.42	1.76	6.55	2.34	0.050 _a
Explicit mental state reasoning questions	9.08	3.75	4.98	3.96	<0.001 _a
Spontaneous mental state inference question	0.27	0.54	0.09	0.28	<0.001 _a

Table 2

Differences in task performance between CG and SG.

*aMann-Whitney U test was used to calculate the differences between the groups
Statistically significant: $p < 0.01$, Bonferroni correction*

Following this, the explicit ToM scores were analyzed using linear regression in the two different groups. Both models exist according to Table 3, as the global F test's ANOVA values are under 0.01, and the explanatory powers are higher than 0,3, prompting the investigators that the models are satisfactory to draw conclusions. According to our findings, explicit ToM is not significantly

influenced by age ($p=0.036$, $p_s=0.076$), education ($p=0.388$, $p_s=0.981$) and gender ($p=0.595$, $p_s=0.343$). Out of the participants so few responded to the spontaneous mental state inference questions in both groups (SG 4, CG 11) that it was not statistically relevant to analyze the influence of age, education, and gender on spontaneous mental state inferences.

	Control group (CG) (n=48)		Schizophrenic group (SG)(n=47)	
<i>Model</i>	<i>ANOVA p-value</i>	<i>Adjusted R Square</i>	<i>ANOVA p-value</i>	<i>Adjusted R Square</i>
	0.000	0.378	0.001	0.332
<i>Parameters</i>	<i>Unstandardized B coefficients</i>	<i>p-value</i>	<i>Unstandardized B coefficients</i>	<i>p-value</i>
Age (year)	-0.050	0.036	0.087	0.076
Education (years)	0.162	0.388	-0.005	0.981
Gender (0=female)	0.474	0.595	1.074	0.343

Table 3

The effects of age, education, gender on explicit ToM skills in the two groups. Linear Regression.

We analyzed further only the between group differences in explicit mental state reasoning for the same reason. To compare our two groups' ToM skills independently of comprehension in terms of explicit ToM, we performed ANCOVA to provide the statistical significance value of whether there are statistically significant differences in explicit ToM between the two groups (SG and CG) when adjusted for comprehension. We found that there is a statistically significant difference

between adjusted means ($p=0.002$), and persons with schizophrenia achieved significantly lower scores than those of the control group (Table 4).

Explicit ToM	Diagnoses		p-value
	SG (n=47)	CG (n=48)	
Mean	4.98	9.08	0.002 ^a

Table 4

The number of people in each group and the differences in explicit ToM between the two groups (CG and SG) when adjusted for comprehension

^aANCOVA test was used to calculate the differences between the groups

Statistically significant: $p < 0.01$, Bonferroni correction

Analyzing the ceiling effect in explicit ToM, scores in SG were relatively normally distributed with a slight positive skew (skew = 0.82, kurtosis = -0.11) indicating an asymmetry in the distribution where by the majority of scores were on the left side of the distribution (reflecting that the majority of individuals received scores of 7 out of 16 possible points or lower) (Figure 2). Importantly, there was substantial variation in results across individuals with scores ranging from 0 to 15 (possible scores = 0-16), and no indication of a ceiling effect (2,1% of participants scoring 16/16 or 15/16) with a mean score 5.0 ± 1.2 .

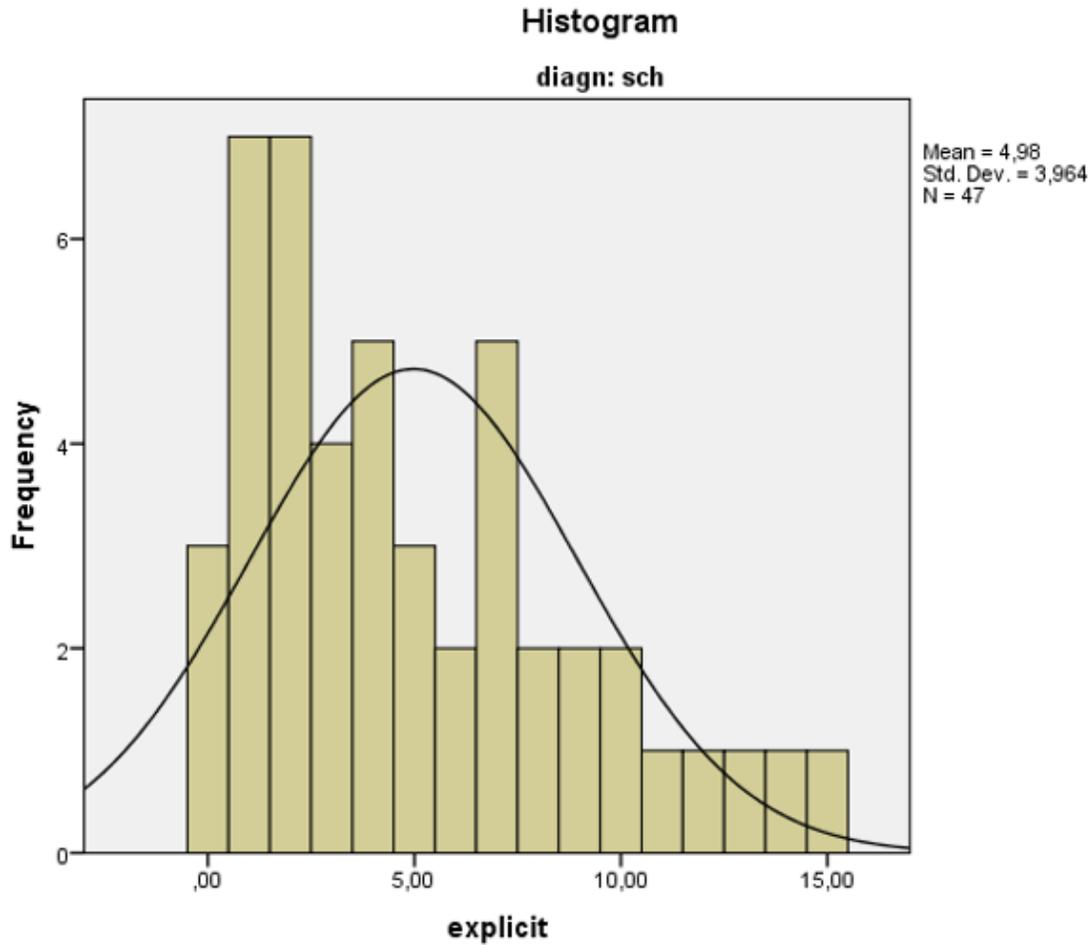


Figure 2.

Distribution of Explicit Mental State reasoning score in Schizophrenia Group

While examining the CG in the same field we also found that the data was close to the normal distribution with negative kurtosis (skew = -0.03, kurtosis = -1,10), which is flatter than the normal curve (so similar persons reached points 5-12) (Figure 3). There was substantial variation in results across individuals with scores ranging from 2 to 15 (possible scores= 0-16), and there was no indication of a ceiling effect (8,3% of participants scoring 16/16 or 15/16). Mean score was 9.1 ± 1.1 .

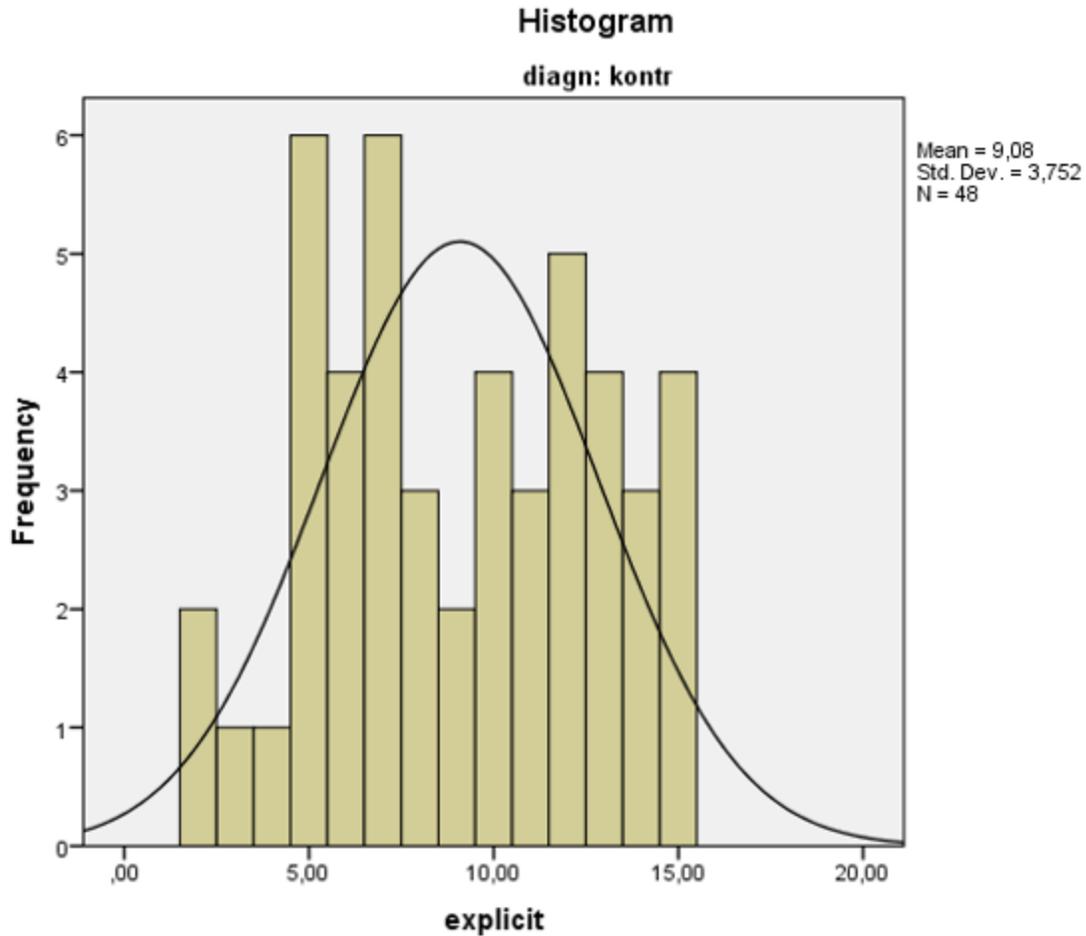


Figure 3.
Distribution of Explicit Mental State reasoning score in Control Group

9.4. Discussion

In the present study we reported our results gathered from utilizing the Short Story Task, which was originally designed and tested in English with healthy participants (Dodell-Feder et al., 2013). In the present research our aim was to test the applicability of SST in schizophrenia. As far as we know, this is the first study in which the ToM performance of persons with schizophrenia has been investigated while using this method.

According to our hypothesis, significant differences were detected in the explicit ToM scores between the persons with schizophrenia and the control group participants. Explicit mental state reasoning was found not to be influenced by age, education, and gender. The scores also indicated

the lack of ceiling effect in both groups. In line with our expectations, there were also significantly more spontaneous ToM references among healthy subjects than among patients. Although our assumption has been substantiated, unfortunately the case numbers were quite low. Only a few participants (SG: 4/47, CG: 11/48) answered the spontaneous mental state inference question in both groups while using mental state terms. The patient group performed more poorly in the comprehension questions, although after Bonferroni correction- the difference between the groups did not reach the significance level.

Generally, our results confirm previous data that explicit ToM is markedly impaired in schizophrenia, however, we cannot dismiss the occurrence of a more general language processing disturbance (e.g. verbal comprehension, pragmatic deficit) in terms of weak ToM performance (Bambini et al., 2016; Langdon et al., 2017). Although comprehension scores did not differ significantly after Bonferroni correction the performance of the patients was still poor compared to the healthy controls. These results may reflect a more general language processing deficit, however, they line up with the findings of the original study of Dodell-Feder et al. (Dodell-Feder et al., 2013), namely that ToM scores were unrelated to understanding the non metal aspects of the story. They concluded firstly, that their structured interview questions successfully isolated ToM skills from the general reading abilities, and secondly that comprehension scores did not link with the other measures of social cognition used for concurrent validation of the SST. For further investigation, we compared our two groups' explicit mental state reasoning skills when adjusted for comprehension. Persons with schizophrenia still achieved significantly lower scores in explicit mental state reasoning questions than the control group participants. On the other hand, so few participants responded while using mental state terms in the spontaneous mental state inferences questions in both groups, that it was not statistically relevant to compare their performances accordingly.

The low number of spontaneous mental state inferences in both groups was an unexpected result, and this finding may reveal a potential limitation of SST. It suggests that SST may be more suitable for evaluating the explicit mental states, as only one question seems disproportionately scant for assessing spontaneous mental states compared to the 8 explicit mental state reasoning questions. This may also suggest that supplementing SST with an easily applicable test for measuring spontaneous ToM (e.g. Social Attribution Task, multiple-choice version, SAT-MC, (Bell et al., 2010; Johannesen et al., 2018)) would create a more complex and detailed picture of ToM deficits

in schizophrenia. It is in line with literature suggesting that multimodal assessment should be used to explore the ToM deficits in schizophrenia (Song et al., 2015). Overall it could be concluded, that the new short story method is easy to implement, requires no special conditions, takes about 25-30 minutes on average to read the story and answer the questions, and it is easy to score reliably. The detailed instructions, questions, and the anchoring points in the clearly defined point system simplify the evaluation process. Although SST is easy to administer, the full time demand (reading the short story, the interview, and scoring) is longer than in other ToM measures (e.g. the administration time of above-mentioned SAT-M is approximately 10 minutes), which in turn may limit the everyday use in certain clinical circumstances.

An important result of our study was the confirmation of the lack of ceiling effect since –according to our findings neither the patients, nor the healthy participants achieved 100%, unlike in the other frequently used ToM tests, so the distribution of the scores confirms the lack of ceiling effect. It is important to note on the other hand that patient scores also showed very high variability, confirming the test’s sensitivity to individual differences in terms of ToM skills.

This substantial variation in performance may assist to generate a more subtle assessment of ToM skills. ToM is a key aspect of social cognition, which has strong relations to community functioning (Green et al., 2019), hence, ToM is a proximal skill to functioning, and taking these individual differences into consideration may even help in customizing the rehabilitation plan in the future. Additionally, further development of this new evaluation method may open perspectives for further preventive screenings of the ToM deficit in high-risk groups. Reliable data suggests that ToM skills deteriorate in the early course of the disorder, as clinically high-risk subjects exhibit a blunted developmental trajectory in ToM skills from age 17 onward (Davidson et al., 2018).

Recently, the applicability of SST has also been demonstrated in a study in a high-risk group for schizophrenia (Vargas et al., 2019). High-risk individuals did not differ significantly from the control group in explicit mentalizing abilities, but gave much less interpretation of spontaneous mental status than healthy individuals. Their results suggest that the deficit of implicit mentalization can be observed even before the onset of the psychotic state, when explicit mentalization performance is not yet affected. This study described reduced-efficiency functionality on both sides in the medial prefrontal lobe, which was associated with weaker

spontaneous mentalization. This study also revealed that SST is able to measure mentalization performance with sufficient sensitivity in a clinical population.

These early developmental characteristics highlight the significance of potential treatment approaches. Early detection may support a preventive treatment strategy. In the above mentioned study, the authors found that timely treatment with antipsychotic and antidepressant medication may normalize the age-trajectory, for instance (Davidson et al., 2018). Limited data is available on the pharmacological and psychosocial interventions targeting social cognition in the early phase of psychotic disorders (Yamada et al., 2019), more results are, however, available of treatment opportunities in the later stages of schizophrenia. There is an increasing interest in pharmacological approaches in treating ToM deficits (Bürkner et al., 2017; Green et al., 2019; Javed and Charles, 2018; Kucharska-Pietura and Mortimer, 2013), but only minimal or no effect has been reported in terms of patients with schizophrenia. Antipsychotics do not have significant impact on ToM performance, and the effect of oxytocin is also inconclusive so far, although there are some promising results (Bürkner et al., 2017; Green et al., 2019; Javed and Charles, 2018; Kucharska-Pietura and Mortimer, 2013). There is considerably more data available on the psychosocial interventions while more and more promising treatment modalities have been emerging in the past 20 years. Meta-analyses and reviews suggest that these interventions could improve ToM with moderate to large effect size (Green et al., 2019; Javed and Charles, 2018; Kurtz et al., 2016). However, the generalizability and transferability to real world functioning, and the dissemination of psychosocial interventions is still an important issue.

Future perspective of SST can be linked to a potential further development of SST Administration and Scoring Materials, which might be the most prominent strength of SST. It could easily be adapted to different short stories, which means that potentially several different SST batteries could be generated, which in turn may enable the repeated use of SST to monitor the changes in ToM abilities.

9.4.1. Limitations

However, some limitations should be addressed. Such as the lack of full PANSS, as the different symptom domains of schizophrenia, especially negative symptoms, were reportedly associated with ToM (Bell et al., 2013; Bliksted et al., 2017; Pelletier-Baldelli and Holt, 2020). According to the remission criteria of schizophrenia (Andreasen et al., 2005) we measured three negative

symptom items of PANSS: blunted affect, passive/apathetic social withdrawal and lack of spontaneity and flow of conversation. Results on negative symptoms and ToM suggest (Bell et al., 2013; Bliksted et al., 2017) these symptoms may interfere with ToM tasks, especially with verbally mediated tasks having substantial verbal memory and expression demands. However, our patients exhibited only mild or no negative symptoms, which suggests that negative symptoms might not have influenced the performance in SST. The lack of the full PANSS however is still a limitation of the study, and future investigations should address this dimension. We did not use independent auditory verbal comprehension tests to rule out the confounding effect of verbal comprehension. Although SST includes comprehension questions, the fact that persons with schizophrenia performed less accurately in terms of the comprehension questions compared to the control subjects highlights this limitation. Due to time restrictions we did not have the opportunity to test concurrent validity with other ToM measures in schizophrenia. In spite of the fact that the main purpose of this study was to test the applicability of the new SST with persons with schizophrenia, the lack of use of another ToM test as a comparison is yet another important limitation that should be addressed in future studies. While general intelligence was not assessed, the educational levels were compared in the two samples in order to limit the potential effects of IQ. The question of medication of the patient group also poses another limitation. All patients were on maintenance antipsychotic treatment medications and – while data on the effects of antipsychotics on ToM are limited – according to our current knowledge antipsychotics do not significantly influence patients’ mental state reasoning abilities (Horan and Green, 2019; Kucharska-Pietura and Mortimer, 2013).

9.4.2. Conclusion

As a conclusion we found that our results lined up with the original Dodell-Feder et al findings and we found that reading fiction could be used as an assessment tool for explicit ToM skills in persons with schizophrenia (Dodell-Feder et al., 2013). The patients performed more poorly in SST compared to healthy controls. The SST lacks the ceiling effect, and it is sensitive to explore the individual differences in ToM performance, and so it can be useful in planning psychosocial interventions. An important limitation of SST is the low sensitivity to measure spontaneous ToM and the relatively long administration time.

10. Hemingway: “The End of Something”– the backstory and analysis

Ernest Hemingway's participation in World War I as a Red Cross ambulance driver in Italy had a tremendous impact on his development as a writer. Wounded in both legs by a shrapnel explosion near the front lines, he returned to the United States a decorated hero where he eventually returned to journalism to support himself. In 1921 he returned to Europe to launch a writing career where for the next seven years, Hemingway resided principally in France, though he traveled frequently, covering the Greco-Turkish War of 1922 and writing special-interest pieces for the Toronto newspaper. During this period he matured as a writer, greatly aided in his artistic development by his close contact with several of the most prominent writers of the time, his scholars have traced echoes of works by T.S. Eliot, including Gertrude Stein, James Joyce, Ezra Pound, Sherwood Anderson, Ford Madox Ford, John dos Passos and F. Scott Fitzgerald to name a few. Hemingway's power and originality as a writer of compressed, impressionistic sketches became apparent with „*In Our Time*” (1924). A series of eighteen brief, untitled chapters stemming from Hemingway's war and journalistic experiences, this work was revised, greatly expanded, and published in the United States a year later. He eventually quit journalism, though he periodically returned to the medium, serving as a correspondent during several major wars. By the middle of the 1940s, however, a variety of recurrent physical ailments had severely curtailed his creative energy. In 1960 Hemingway suffered a mental breakdown and was admitted to the Mayo Clinic for electroconvulsive therapy. His depressive behavior and other illnesses persisted, and Hemingway committed suicide the following year. Hemingway's suicide is an autonomous, danger-seeker masculine, „ macho” man's reaction to vulnerability, to the feeling of helplessness, to the growing number of various physical and mental illnesses, to aging, in a last heroic attempt to take his destiny into his own hands.

The important maintenance of self-esteem, and the provision of the "public image" stand in the background of his suicide – to remain as strong and intact in the public eye as he would like to appear. Contextual elements of the suicide are also likely to emerge in his writings and from the preliminary model effects. His father shot himself and his maternal grandfather tried to commit suicide, both of them - just like Ernest himself - suffered from severe physical ailments, pain, and complications of diabetes. The suicides took place in the physical vicinity of other family members. Ever since Hemingway's first read Stevenson's *Suicide Club* as an adolescent boy,

suicide has repeatedly occupied his thoughts during relationship crises. He talked about hunting and killing animals as an aid to prevent him from committing suicide. He also predicted he would commit suicide in the same way as his father. He threw his father's pistol into a pond as if he wanted to avoid a recurrence of the situation with this magical act. His younger brother shot himself with a pistol, his sister died of medication overdose, both during a similarly severe bodily illness. He offered an opportunity to identify with his person and his works as a highly prestigious writer, and later, among others, one of his biographers his brother, Lester and his third wife as well as his granddaughter became suicidal). With his indirect self-destructive manifestations, alcoholism, a series of life-threatening accidents, and death-risking self-tests, his „game” also provided a pattern to follow for suicide. Although it is out of the scope of the thesis to discuss the exact psychopathology of Hemingway, manic episodes also should be mentioned that were present as early as the 1920 (Dearborn, 2017). According to his latest biography manic episodes got worse later, but it also gave him creative energy (Dearborn, 2017). “One of the standard opinions about Hemingway is that he is a writer predominantly concerned with violence and death. His omission style of writing (emotions unstated) has led us to see too exclusively that which is most visible: tension, threat, violence and death: the surface mathematics of his fiction, the iceberg tips” (Adair, 1983).

„*The End of Something*” is a short story part of Hemingway's first collection of short-stories called „*In Our Time*” which was published in 1925. “Although Hemingway is usually labeled as a realist, *In Our Time*” exhibits many metafictional qualities” (Vaughn, 1989). In this 1925 New York edition he introduced Nick Adams as a protagonist of the first two short stories in the collection followed by „ *The End of Something*” , which is also set in Michigan, and details Nick's break-up with his girlfriend, Marjorie. Nick serves as a semi-autobiographical character, an alter ego. According to Philip Young –a psycho-biographical interpreter of Hemingway's work- „Nick Adams, is but the projection of Hemingway himself, whose writing is considered as the dramatization or even the over-dramatization of the important events that marked his life, starting with his wounding in World War I” (Abouddahad, 2007). Hemingway was, according to Young, “traumatized” by the violence of the injury and so were his protagonists whose scope is delimited by an incident that functions like the primal scene of the whole work”(Abouddahab, 2007). The first two stories, "*Indian Camp*" and "*The Doctor and the Doctor's Wife*", can be read as an exercise in counterpoint, where feelings of loss, anger, and evil are ignored and repressed. "*The End of*

Something" and *"The Three-Day Blow"* could be paired up; in the first novel Nick Adams breaks up with his girlfriend, Marjorie and in the second novel Nick gets drunk and denies that the relationship has ended, while convincing himself that he can fix the problems. According to Tetlow "the vignettes are concisely written and contain illustrative images, but they lack a developed plot (Tetlow, 1992). Several of the 16 inter-story vignettes had originated as newspaper dispatches (the vignettes in the collection have no traditional sense of narrative; they begin in the middle (Cohen, 2012). "Shifting points-of-view and narrative perspectives disguise autobiographical details" (Cohen, 2012). „The characters face loss with inner strength, stoicism and a sense of acceptance; they build strength in the stories that come after, gaining self-awareness as they accept the futility and pain of life" (Tetlow, 1992). Debra Modellmog highlights how all of the Nick storylines are about a "flight from pain" (Modellmog, 1988). She believes that Gertrude Stein's definition of the Lost Generation applies to „In Our Time" as much, if not more so, as to „The Sun Also Rises"; that "Nick seems to believe that the things most worth having and caring about – life, love, ideals, companions, peace, freedom – will be lost sooner or later, and he is not sure how to cope with this assurance, except through irony, bitterness, and, sometimes, wishful thinking (Modellmog, 1988). „In Our Time" was Hemingway's first attempt at minimalist style, employing simple sentences and diction emulating Ezra Pound's imagist style. Hemingway's work is more concerned with loss, the fear of loss and the aftermath of loss (longing, confusion, remorse, hunger, nostalgia) (Adair, 1978).

Throughout the short story the notion of loss plays an important role: Nick finds that things with Marjorie have come to an ending. Due to the longing for the past, he spends a great deal of his story remembering. Mutability, loss, fear of loss, longing, nostalgia, lost love, lost illusions, lost youth and people and places: these are his basic themes. „Nick falls out of love, no explanation for it, it just happens. The point of the story is less about Nick falling out of love, and more of his appalled recognition that he can" (Burhans, 1968). Philip Young approached interestingly the crucial issues of Hemingway's work by looking at heroism and the "Hemingway-Code," a sort of heroic system of behavior –which appears in most of Hemingway's stories "[...] made of the controls of honor and courage which in a life of tension and pain make a man a man and distinguish him from the people who follow random impulses, let down their hair, and are generally messy, perhaps cowardly, and without inviolable rules for how to live holding tight" (Young, 1966 in Abouddahab, 2007). „In Our Time" is neither an anthology nor a novel, a literary hybrid, with

something of the variety from an anthology and something of the unity of a novel. In its view of the world and of man's efforts to live in it with meaning and order, in its ironic and symbolic method, in its lean and intensified style, his books reflect all the intellectual and aesthetic concerns which dominated his life and work from beginning to end" (Burhans, 1968). "In the short stories and vignettes of *In Our Time*, the narrator tends to take the conventional omniscient narrator's stance and tends to call attention neither to himself nor to his participation in the story" (Vaughn, 1989). Hemingway made his trademark by underrepresenting his characters' feelings by forcing his characters' physical actions to stand in for mental states- he did so by relying on our „evolved cognitive tendency which would assume that there must be a mental stance behind each physical action and our striving to represent to ourselves that possible mental stance even when the author has left us with the absolute minimum of necessary cues for constructing such a representation" (Zunshein, 2002).

ToM's one particular aspect is worth exploring in terms of understanding literary texts and that is our ability to navigate between multiple, different levels of intentionality in the narrative while reading the text. Daniel Dennett and Robin Dunbar did not agree in terms of the number of levels of intentionality: according to Dunbar "our cognitive may discourage the proliferation of cultural narratives that involve infinite levels of intentionality" (Zushein, 2002). Dunbar's results suggest that the subjects marked difficulties in the process of stories involving multiple levels of mind reading intentionality and he offers a fascinating speculation about the significance of his findings: "The fact that people experience considerable difficulty with fifth order intentional statements but not fourth-order ones, may explain why writing fiction is much harder than reading it, and my thus in part explain why good writers are much less common than good readers... A novelist writing about a relationship between two people has to intend that the reader think that character A supposes that character B wants character C to believe that...-five orders of intentionality. The reader in contrast has a much easier task: he merely has to think that A supposes that B wants C to believe that...four orders of intentionality." (Dunbar, in Zushein, 2002).

Based on the above it could be concluded, that significant research articles (Mar et al. 2008, Dodell-Feder et al. 2013, Kidd and Castano 2013, 2016, Black and Barnes 2018, Pino and Mazza, 2016) support the idea of reading literary fiction and reading processes in general as a way of improving and promoting mentalizing abilities. Narrative fiction offers models of the social world

while creating an experience of simulated social interactions for the readers. Engaging in the simulative experiences of literary fiction could help us understand others and can aid our capacity for mentalizing, empathy and social inference. Based on these findings primarily set among healthy participants we could conclude that these research results may set important goals for future low-cost rehabilitation protocols for illnesses, in which the mentalizing deficit is considered central such as schizophrenia.

11. Literary fiction is a royal road to mentalizing?

According to recent results, fiction and narrative processing is an emerging and promising approach in improving social cognition (Enrici et al., 2019). In this sense paraphrasing Freud (*“The interpretation of dreams is the royal road to a knowledge of the unconscious activities of the mind”*, in: Freud, *Interpretation of Dreams*, 1955) we may say that literary fiction is a royal road to mentalizing. It means that the relevance of literary fiction in ToM research expands beyond testing.

Reading literary fiction on a regular basis has an impact on routine thinking by allowing readers to identify with the characters in the story without having to face the potential negative consequences of actual, real participation. Because literary characters are most often the focus of literary works, this encourages readers to observe and monitor the mental state of the characters while reading (as opposed to non-fictional literary works, where a psychological block may occur in the reader because they are aware that these events took place in real life) (Pino and Mazza, 2016). Several studies have shown a positive correlation between knowledge and reading of literary works and mentalizing skills, suggesting that time spent reading can strengthen our abilities to successfully understand the world around us (Kidd and Castano, 2017). According to this research, those who read a lot of literary fiction become more empathetic because fiction serves as a kind of simulation of social experiences in which people practice and further develop their interpersonal skills (Bal and Veltkamp, 2013). The peculiarity of Kidd and Castano's research is that it provides evidence that, although reading almost all literary fiction can provide a basis for these simulated social experiences, a relationship with literary fiction in particular can positively influence mentalizing performance (prior knowledge of literary fiction indicated better performance for the Eye Read test) (Kidd and Castano, 2017). The positive effect of fiction literature on mentalization was later repeated by Black and Barnes anyway, with the results controlled by prior literary experience (Black and Barnes, 2015).

Literary fiction thus allows readers to reflect upon the characters' behavior and mental state without fear of the risks associated with real social behavior according to their own tempo. An interesting question has also been raised as to whether literary fiction elicits stronger emotional reactions than reading non-fiction stories. Bruner also argued that it is often difficult to separate fiction from nonfiction, which is why he separated logical-scientific thinking (which seeks to search for universal truths through reasoning and logic) from narrative thinking (which focuses on the authenticity valued by the reader). When we read a story, we can predict the actions and reactions of the characters by drawing conclusions from what they feel, think, intend to do. In this process, the story makes sense and offers an opportunity to understand others by also taking the perspectives of the characters into account (by empathizing with them) (Bal and Veltkamp, 2013). According to Appell, involvement in narrative is a major precursor to changes in the individual, so direct change is more likely to occur when the reader is also emotionally involved in the story (Appel, 2008). It is also important to mention the so-called "absolute sleeper effect", which should be mentioned as one of the important effects of literary fiction (accordingly, the effect of reading literary works does not appear immediately, but over time), as the process of transformation/change requires time (Bal and Veltkamp, 2013). Another positive effect of emotional involvement is that the reader also remembers the events of the story better, but this also requires an incubation period (Mar et al., 2006). In Bal and Veltkamp's research, empathy was examined 3 times through the reader's emotional involvement: before reading, after reading, and then again after 1 week (Bal and Veltkamp, 2013). Their results showed that empathic skills deteriorated when there was no emotional involvement on the part of the reader. Their results may also show that reading fictional literary works can also have negative effects if the reader is unable to engage emotionally and this can also result in negative attitudes and deviations from literature in the long run.

Over the past decade, there have been a number of attempts to improve the ability to mentalize and empathize with people in healthy and psychiatric populations. Kidd and Castano discovered a very interesting area of research in the field of social cognition related to reading literary texts (Kidd and Castano, 2017, 2013). Few studies deal with the emotional and social components that occur when reading literary texts, and only a few studies have explicitly examined the emotional processes underlying story processing.

Pino and Mazza - based on the research of Kidd and Castano (Kidd and Castano, 2013) and Black and Barnes (Black and Barnes, 2015) - attempted to replicate and expand previous studies using a variety of mentalization and empathy tests (Pino and Mazza, 2016). Participants were asked to read an entire book (fiction, science fiction, or science fiction) and complete several social cognition tests before and after reading. Only after reading the literary fiction was an improvement in mentalizing skills observed, but no change in empathic emotional resonance could be detected.

11.1. The potential role of literary fiction in therapy

There is a growing interest in mentalization in clinical research, particularly in relation to its relationship to normal and pathological functioning, and as a potential contributing factor to the mechanism of psychotherapeutic change. Several studies have aimed to improve rehabilitation protocols for some psychiatric illnesses. According to Pino and Mazza, a more nuanced understanding of the effects of reading is needed for a potential rehabilitation intervention for disorders where the focus is on empathy and mentalization, such as autism and schizophrenia spectrum disorders (Pino and Mazza, 2016). In their aforementioned study, Vargas et al. highlighted that mentalizing capacity as measured by SST is impaired in groups at clinically high risk for schizophrenia, and this is closely related to the functional outcome of the disorder and the severity of the symptoms (Vargas et al., 2019). The authors clearly conclude that the results point to potential therapeutic targets. Reading fiction literature can be a possible rehabilitation tool. As described earlier, reading is an exercise where social interactions can be simulated without anxiety. Short stories are an optimal alternative in this sense, as they require relatively little neurocognitive effort (e.g., working memory, verbal memory, etc.) while retaining the processing characteristics of fiction literature that require mentalizing effort. Reading short short stories reduces the feeling of being forced to close cognitively (lack of order and structure, and the need to close due to the inconvenience of uncertainty) (Djikic et al., 2013,). At the same time, it also trains readers (as do the various interventions that improve social cognition) to be flexible in evaluating the behavior of others and not to draw conclusions too soon (Dodell-Feder et al., 2013). Since the emblematic study of Kidd and Castano, a meta-analysis is now available which, based on 14 studies, found that the literary fiction has a relatively small but significant impact on social cognition (Dodell-Feder and Tamir, 2018). According to the authors, this effect is presumably related to the fact that

readers immerse themselves in the world created by literary fiction and inevitably become involved in the mental and social life of fictional characters, which in turn brings activation of the mentalization system. However, there may be other benefits to reading literary fiction. Literary fiction can also bolster the learning of mental state vocabulary (Mar et al., 2006), which seems to be compromised in schizophrenia (Langdon et al., 2017). Patients are less likely to use so-called mentalizing phrases that refer to mentalizing activity (e.g., thought, I think, in my opinion, felt sad, angry, etc.) (Langdon et al., 2017). The Hemingway short story “The End of Something” already mentioned before contains many of these linguistic mentalization references, without directly describing who does what in the story and why.

However, for the time being, the mentalizing-improving effect of fiction literature has been described on the basis of a study of healthy individuals (Dodell-Feder and Tamir, 2018), but Pino and Mazza raise the rehabilitation potential of reading in the case of mental illnesses (Pino and Mazza, 2016). Incorporating well-chosen literary fiction into the rehabilitation protocol can be a simple and cost-effective tool for developing mentalization skills (Pino and Mazza, 2016). However, in the case of psychosocial interventions, this is not such a new idea, just think of the much more widely used poetry or bibliotherapy in the past (Bembry et al., 2013).

The so-called “conversion analysis” may represent a new opportunity in the study of mentalization, literature and linguistic processing, as well as the psychotherapeutic aspects of all these. Conversion analysis is a qualitative method that examines the structure and process of social interactions and can capture the unfolding of mentalization in conversations in a unique way (Shaw et al., 2020). In their publication, Shaw and colleagues stressed the importance of examining mentalization in a relational context, not as an individual ability, as it is constructed in context, from attitudes toward others (Shaw et al., 2020). This new approach argues for an alternative to conversion analysis. A person’s mentalizing ability can vary depending on relationships and attachment factors, and within a relationship, this can depend on the nature and quality of the interaction. This approach can be used to determine how therapists can enhance a patient’s mentalizing ability in a therapeutic session by directing therapeutic interventions and assessing treatment integrity and characteristics of the therapeutic process (Shaw et al., 2020).

In conclusion, the results of several studies support the claim that reading literary fiction can improve readers’ empathy and mentalizing abilities. Research findings from a variety of fields

have consistently suggested that reading literary works (including literary fiction) improves the ability for intersubjective connections. According to Kidd, Castano, reading literary fiction is much more likely to promote the development of mentalizing skills than non-literary fictional works and non-fictional works, respectively (Black and Barnes, 2015; Kidd and Castano, 2013). The authors investigated that a relationship with another, even if invented, could improve psychological processes that support intersubjectivity. Most people read literature to learn, to have fun, or to experience beauty, or to find a way to others. However, these goals "may also serve moral purposes". Reading literary fiction helps to develop further schemas, to shape a different worldview different from ours. Literature, in addition to enchanting or comforting us, has a mentally developing effect and renews our relationship with the world, so it is also suitable for us to discover what it means to be an ethical person in a given socio-historical situation. Since reading fiction could promote mentalizing abilities, it could be conceived as a low-cost tool to be potentially integrated into psychosocial interventions or utilized in rehabilitation programs in schizophrenia (Pino and Mazza, 2016), leading us to a possible conclusion that SST could be a useful and natural equipment in measuring mentalizing skills and in their follow up examinations.

12. Final conclusions

A significant amount of evidence demonstrates that improving social functioning is a key element in treating patients living with schizophrenia, which emphasizes the role of interventions targeting social functioning.

Overall - compared to standard care - more research supports the efficacy of social skills training for schizophrenia with good results in terms of quality of life, mental state and social functioning, however the evidence is still very limited with data rated at low quality. There is some evidence that social skills training leads to skill acquisition and maintenance in schizophrenia, especially if it is intensive and of sufficient duration. However, cautious optimism is warranted regarding the less than satisfactory generalization of social skills training to real life situations. The research on social cognition in the last two decades enriched significantly the knowledge about social functioning, and it must be incorporated in future psychosocial interventions as we can see in the latest interventions aiming to improve social functioning (e.g. metacognitive training, social cognitive skills training). However, the generalizability and transferability to real world functioning, and the dissemination of interventions is a significant issue both in social skills training and in social cognitive remediation.

Latest research data on psychosocial interventions in schizophrenia also emphasizes the role of personalized treatment, which draws attention to the importance of personalized diagnosis. Most of the assessment tools used in social cognitive research in schizophrenia exhibit significant ceiling effects. In our study we explored the new Short Story Task to assess ToM, which is a key aspect of social cognition. The lack of ceiling effect suggests that SST can be used to grasp the individual differences that may even help in customizing the rehabilitation plan in the future.

On the other hand, SST uses literary fiction, which is a promising tool in improving social skills. Hence SST not just a new assessment tool, but it also emphasizes the role of literature as a therapeutic tool. As reading fiction could promote social cognitive skills, it could be conceived as a low-cost tool to be potentially integrated into psychosocial interventions in schizophrenia.

13. New observations

1. Our study was the first to demonstrate Theory of Mind deficits in schizophrenia using Short Story Task. According to our results, the Short Story Task can be applied in the assessment of patients with schizophrenia.
2. Our research group adapted The Short Story Task to Hungarian.
3. Our results revealed that the Short Story Task is more sensitive to measure explicit Theory of Mind, at the same time we also demonstrated that it is less sensitive to assess spontaneous Theory of Mind.
4. We also proved that Theory of Mind performance is unrelated to general reading and comprehending abilities in schizophrenia.

14. References

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15. List of publications

Publications related to the thesis

1. **Fekete, J.**, Pótó, Zs., Varga, E., Csulak, T., Zsélyi, O., Tényi, T., Herold, R., 2020. Persons With Schizophrenia Misread Hemingway: A New Approach to Study Theory of Mind in Schizophrenia. *Frontiers in Psychiatry* 11, 396. <https://dx.doi.org/10.3389/fpsyt.2020.00396>.
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2. **Fekete, J.**, 2017. A Narrative Review on the Efficacy Studies of Social Skills Training for Patients with Schizophrenia with Special Focus on the Relationship between Social Cognition and Social Skills. *Psychiatria Hungarica* 32 (2) 225-237.
3. **Fekete, J.**, Herold, R., 2020. Az irodalmi művek olvasásának jelentősége, mentalizációra gyakorolt hatása és potenciális terápiás lehetőségei. *Psychiatria Hungarica* 35 (3) 389-396.

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Publications not related to the thesis

1. Berecz, H., Csábi, Gy., Herold, R., Trixler, D., **Fekete, J.**, Tényi, T., 2017. Minor physical anomalies and dermatoglyphic signs in affective disorders: A systematic review, *Psychiatria Hungarica* 32(1) 108-127.
2. Fekete, S., Osváth, P., **Fekete, J.**, Vörös, V., 2018. Linguistic Research on Specific Features of Suicidal Communication, Past, Present, and Future. *Clinical Psychological Science* 6(6) 759-760.
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3. Fekete, S., Osváth, P., **Fekete, J.**, Vörös, V., 2018. A szélsőséges nyelvi kifejezések marker-specifikusak lehetnek depresszió, szorongás, szuicid viselkedés eseteiben – gépi tartalomelemző programok lehetőségei. *Psychiatria Hungarica* 33(2) 145-147.
4. Varga, E., Herold, R., Tényi, T., Endre, Sz., **Fekete, J.**, Bugya, T., 2019. Social Cognition Analyzer Application (SCAN) a new method for the analysis of social cognition in schizophrenia, *Frontiers In Psychiatry* 10 article: 912 , 14 p.
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5. Fekete, S., Osváth, P., Vörös, V., Tényi, T., **Fekete, J.** 2019. The Papageno-Effect in suicidology. *Psychiatria Hungarica : A Magyar Pszichiátriai Társaság tudományos folyóirata*, 34(3), 322-324.
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7. Egyed, Cs., **Fekete, J.**, 2020. Skizofrén beteg-orvos párbeszédnek nyelvészeti elemzése egy esettanulmány alapján. XIX. SZOKOE Nemzetközi Szaknyelvi Konferencia Budapest, 2019.11.15-16., in press *Porta Lingua*.
8. **Fekete, J.**, Eklics, K., 2020. Medical improvisation facilitating development of students' confident responses. XIX: SZOKOE Nemzetközi Szaknyelvi Konferencia Budapest, 2019.11.15-16. In press, *Porta Lingua*.
9. Eklics, K., **Fekete, J.**, 2020. The role of simulation practices in acquisition or activation of medical terminology. XIX. SZOKOE Nemzetközi Szaknyelvi Konferencia Budapest, 2019.11.15-16. In press, *Porta Lingua*.

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Abstracts not related to the thesis

1. Berecz, H., Csábi, Gy., Jeges, S., Herold, R., Simon, M., **Fekete, J.**, Trixler, D., Hajnal, A., Tóth, L., Tényi, T., 2018. Minor fizikális anomáliák előfordulása bipoláris I és bipoláris II zavarban. Eredmények a Méhes Skálával, *Psychiatria Hungarica* 33 : Suppl. 1, 15-15.
2. Egyed, Cs., **Fekete, J.**, 2020. Linguistic Analysis of Doctor-Schizophrenia Patient Communication, 2nd International Conference of the Slovene Association of LSP Teachers, abstract accepted.
3. Eklics, K., **Fekete, J.**, 2020. Code-switching from a simulated medical interview to a case presentation, 2nd International Conference of the Slovene Association of LSP Teachers, abstract accepted.
4. **Fekete, J.**, Szolcsányi, J., 2020. Teaching and learning in Medical Education while using Medical Improvisational Techniques, 2nd International Conference of the Slovene Association of LSP Teachers, abstract accepted.
5. **Fekete, J.**, Egyed, Cs., 2020. Theory of mind and Schizophrenia, Qualitative Research on Mental Health Conference, abstract accepted.
6. Egyed, Cs., **Fekete, J.**, 2020. Linguistic Analysis of Doctor-Schizophrenic Patient Communication, Qualitative Research on Mental Health Conference, abstract accepted.

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Appendix 1.

study	number of partic.	experimental	control	age	gender*	medication	duration/frequency	outcome measures	results	followup
1990 Mueser et al.	115	acutely ill in-patients	within group pre and posttest	NR	NR	NR	NR	Standard SST (4-5 sessions)	compromise, negotiation, affect expression skills improved, best at those who participated in role plays	NR
1991 Hogarty et al.	103	schizophrenia patients SST	supportive therapy	27	66	NR	1x/week for 1 year relapse rate	NR	SST had 20% relapse rate compared to 41% in supportive therapy	NR
1992 Wallace, Liberman et al.	108	schizophrenia patients SST	waiting list control	33	82	NR	13-20 weeks twice a week	UCLA social and instrumental skills training modules	skills improved, no perfect learning outcome	1 year FU no decline, maintained skills
1992 Eckman et al.	41	schizophrenia patients SST	group psychotherapy	NR	NR	NR	18 months for twice a week for 6 months	UCLA medication and symptom self- management modules	significant symptom improvements in both	NR
1993 Wong, Massel, Martinez-Diaz et al.	3	schizophrenia patients SST	group psychotherapy	24-33	NR	neuroleptic medication	20-30 mins 4 times a week	conversational/verbal skills in office then in vivo	response rates were higher in office than in naturalistic settings	3month FU no decline in certain personal target skills
1995 Halford et al.	38	subacute schizophrenia within group pretest and posttest	NR	NR	NR	NR	70 weeks	5 UCLA skills training modules	reduced psychopathology and negative symptoms, improved quality of life	NR
1995 Hayes et al.	63	subacute schizophrenia SST	discussion group	NR	NR	NR	twice a week for 18 months	NR	SST greater increase in targeted social skills, relapse did not differ	6 month FU groups improved in social functioning and positive symptoms
1995 Jerrel and Ridgely et al	132	no diagnosis, behavioral skills training	12 step recovery or case management	NR	NR	NR	NR	NR	SST demonstrated the most positive and significant changes in psychosocial functioning	24 month FU
1995 Dobson et al.	28	schizophrenia patients SST	social milieu treatment	NR	NR	NR	60 mins for 9 weeks	NR	SST showed greater improvements in social functioning and overall psychiatric symptoms, effects gradually declined after SST ended	NR
1996 Smith et al.	44	acutely ill in-patients	within group pre and posttest	NR	NR	NR	NR	community re-entry and outpatient treatment compliance skills	NR	2 week FU 70% exhibited compliance
1996 Marder et al.	80	schizophrenia patients SST	supportive group therapy	40	100	random assignment to fluphenazine, supplemental oral flu. Or placebo	6 months twice a week, for 18 months once a week	social adjustment and psychotic relapse (BPRS scale)	SST group had better personal well being and total adjustment, reduced symptoms and side effects, early age at onset important effect on social adjustment outcomes, SST useful adjunct to pharmacotherapy for some patients	NR
1998 Liberman et al.	84	schizophrenia patients SST	occupational therapy	NR	NR	NR	12 hs per week for 6 months then 18 months assertive case management	UCLA conversation, recreation, medication and symptom management modules	NR	2 year FU SST demonstrated significantly greater knowledge and performance skills related to SST modules
1998 Meder et al.	97	schizophrenia self-management training	educational control group	NR	NR	NR	3 month trial	NR	both groups higher knowledge and skills test than TAU groups	NR
1998 Kopelowicz et al	59	no diagnosis, SST	occupational therapy	35	71	NR	8x45 mins 4 weeks 6-8 people per group	test of knowledge, attendance, aftercare service	better knowledge, 85% were likely to attend 1st aftercare appointment	NR
1999 Smith et al.	32	no diagnosis, SST	supportive group therapy	35	56	antipsychotic medication	3-4 weeks, once a week	21 question skills measure	performance improved	NR

2001 Liberman, Eckman, Marder	75	schizophrenia social problem-solving group	supportive group therapy	38	90	chlorpromazine-equivalent dosages of antipsychotic medicine	4 months, once a week, 4-6 people	AIPSS pre and post intervention	SPS improved problem-solving in the selection of alternative, in the quality of verbal and non-verbal skills, overall quality of role play performance	NR
2001 Tsang and Pearson	97	no diagnosis, basic social skills and core work-related skills	TAU	36	55	NR	2,5 months 10 session once a week	NR	work-related social competence advantage of both groups	greater number working after SST- 46,7%
2003 Chien	84	no diagnosis, SST	routine nursing care treatment	42	43	NR	4 weeks, twice a week for 60mins	conversation and assertive skills	skills improved, no perfect learning outcome	1 month FU improvement sustained
2005 Granholm et al.	76	no diagnosis, CBSS	TAU	54	74	antipsychotic medication	NR	independent living skills survey, symptoms	SST participants engaged in more social functioning activities, improved cognitive insight, reduced positive symptoms	NR
2005 Mueser et al.	35	no diagnosis, workplace-fundamental skills module SST	supported employment control	38	80	NR	3-4 month trial once a week and FU sessions	employment outcomes and vocational services tracked for 18months	SST clients with greater learning on knowledge test	NR
2006 Patterson et al.	240	no diagnosis, skills training in medication management, social and communication skills, financial management	attention control	51	59	antipsychotic medication	6 month for once a week	functional and social skills, symptoms	experimenter groups showed improvement on total scores	NR
2007 Valencia et al.	82	no diagnosis, symptom and medication management	TAU	30	78	NR	48 weeks once a week	symptoms, relapse, compliance with medication	improved symptoms, lower relapse, higher compliance with medications in SST group	NR
2008 Silverstein et al.	82	no diagnosis, UCLA basic conversation skills module	BCSM and attention shaping	18-55	60	chlorpromazine	twice a week 1 hour	parameter characterizing attentive behavior displayed by subjects, pre and post change of scores in Comprehensive Module Test for BCSM	BCSM+AS higher degree of attentiveness, greater improvement, degree of change, skill acquisition	NR
2009 Galderrisi et al.	30	no diagnosis, SSANIT	SLA	NR	70	2hs once a week for 6 months	SANS test and SAPS test, cognitive abilities, attention, memory, executive functions, verbal fluency, personal and social functioning	NR	NR	FU recast no less than 1 month after-no difference at baseline, SSANIT less disability signs and lower number of dropouts
2011 Horan et al.	68	no diagnosis, random assignment to: SCST, hybrid intervention, UCLA SST	NR	NR	NR	NR	12 weeks twice a week	assessing social cognition, neurocognition, functioning outcome	SCST results greater improvement in emotion processing	NR

NR - no record

SST- social skills training

TAU- treatment-as-usual

FU-follow-up

gender%

SPS- social problem-solving skills

AIPSS-assessment of interpersonal problem-solving skills

IVAST- in-vivo amplification of skills training

SSANIT- social skills and neurocognitive individualized treatment

SLA- structured leisure activity

SANS- skills assessment of negative symptoms

SAPS- skills assessment of positive symptoms

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Appendix 2.

Short Story Task Administration and Scoring Materials

Feladatok a novellához és értékelési szempontok

Instrukciók a résztvevőnek:

Most egy novellát/rövid történetet fog olvasni, aminek a címe *Valami véget ér*”. Csupán néhány oldal hosszú, de kérem, lassan, figyelmesen olvassa. Próbálja meg meghatározni, hogy mi történik és milyen a kapcsolat a szereplők között. Miután végzett, felteszek majd néhány kérdést és hangfelvételt készítek a válaszairól. Van valami kérdése mielőtt elkezdjük?

A történet elolvasása után:

Olvasta már ezt a történetet korábban? [igen | nem]

HA IGEN

Mikor olvasta?

Mennyire jól emlékszik rá?

Iskolai feladat volt elolvasni vagy kedvtelésből tette?

HA IGEN

Hányadik osztályba járt ekkor?

Milyen tárgyból kellett elolvasnia?

Ismerős Önnek a történet? [igen | nem]

HA IGEN

Tud valamit a történetről? Ha igen, mit?

Beszélt valakivel a történetről?

Instrukciók a résztvevőnek:

Felteszek most Önnek néhány kérdést a történettel kapcsolatban. Adok Önnek is egy példányt a kérdésekből, hogy követni tudja. A kérdések többségénél nincs helyes és helytelen válasz, és a kérdések röviden megválaszolhatóak. A szereplők *Ön szerinti* gondolatait, érzelmeit, szándékait is foglalja bele válaszába, amennyiben azok a kérdéshez kapcsolhatóak.

- Kapcsoljuk be a hangfelvevő eszközt és tegyük közel a résztvevőhöz.

- Mondjuk rá a résztvevő *azonosítóját* és hogy *Feladatok egy rövid történethez*.

- NE jelezzünk vissza a résztvevőnek és NE adjunk pontszámokat a kérdések közben.
További vizsgálatokhoz javasoljuk ezen mondat kicserélését erre: “A szereplők *Ön szerinti* gondolatait, érzelmeit, szándékait is foglalja bele válaszába, amennyiben azok a kérdéshez kapcsolhatóak.” Valamint javasoljuk, hogy ezen instrukciókat az első kérdés *után* adjuk.

Kérdések

1. Hogyan foglalná össze néhány mondatban a történetet?
2. Mit néz Nick és Marjorie a part mentén, ahogy eveznek a fok felé, hogy felállítsák horgászbotjaikat?
3. Hogy érti Nick, hogy “Nem kapnak”?
4. Miért van Nicknél és Marjorie-nél egy vödör élő sügér?
5. Mire következtethetünk Marjorie cselekedeteiből: arra, hogy tapasztalt vagy arra, hogy tapasztalatlan horgász? Miért gondolja így?
6. Miért mondja Nick Marjorie-nek, hogy “Te mindent tudsz”?
7. Miért válaszol így Marjorie, “Ó Nick, kérlek, hagyd abba! Nagyon szépen kérlek, ne légy ilyen”?
8. Miért nem mer Nick Marjorie-re nézni?
9. Hogy érti Nick, hogy “Unom a dolgot”?
10. Miért ül Marjorie háttal Nicknek, amikor azt kérdezi, “Unod a szerelmet?”?
11. Miért viszi el Marjorie a csónakot és mit érez ő akkor?
12. Kicsoda Bill, és mire utal, amikor azt kérdezi, “Elment simán? ... Nagy jelenet volt?”?
13. Mit érez Nick, amikor azt mondja, “Ó, menj el, Bill. Menj el egy kis időre”?
14. A történet címe “Valami véget ér.” Mire utal a cím?

Értékelési útmutató és előírások

Általános instrukciók:

- Amennyiben a résztvevő nyilvánvalóan helytelen választ ad, és nem vonja vissza vagy magyarázza meg úgy, hogy válasza 1 vagy 2 pontot érjen, akkor 0 pontot kap.
- Amennyiben a résztvevő válasza 1 és 2 pontot érne, vegyük 2-nek.
- Amennyiben a résztvevő pontosan felel, de nem ad választ a kérdésre, 0 pontot kap.

1) SPONTÁN KÖVETKEZTETÉS A MENTÁLIS ÁLLAPOTRA: Hogyan foglalná össze néhány mondatban a történetet?

A nyílt kérdés a mentális állapotra való spontán következtetés meglétére vagy hiányára világít rá. Amennyiben a résztvevő következtet a mentális állapotra (azaz hitre, gondolatra, vágyra, szándékra, célra, érzelmre), akkor 1 pontot kap. Amennyiben a résztvevő nem következtet a mentális állapotra, akkor 0 pontot kap.

Példák a mentális állapotra való következtetésre:

Nick rosszul érezte magát a Marjorie-vel való szakítás miatt.

Nick végig tervezte, hogy szakítson Marjorie-vel.

Marjorie tudta, hogy Nicknek valami baja van.

Nick nem szerette már Marjorie-t.

Nick úgy dönt, véget vet a kapcsolatnak.

- A résztvevő saját mentális állapotára való utalások, mint például “*Úgy gondolom... Végig tudtam...*” NEM tekinthetők a mentális állapotra való következtetésnek. A következtetésnek mindenképp a történet egy szereplőjére kell vonatkoznia.
- A történet általános hangulatára való utalások, mint például “*Ez egy szomorú történet egy szakításról,*” melyek nem egy szereplő mentális állapotára vonatkoznak, NEM tekinthetők a mentális állapotra való következtetésnek.
- Azon válaszok, melyek a romantikus kapcsolatra vonatkoznak, mint például “*A történet egy párról szól... véget ér a kapcsolatuk... a történet egy fiú és egy lány szakításáról szól... Nick szakít velem*” és nem tartalmazzák világosan valamely szereplő mentális állapotát, NEM tekinthetők a mentális állapotra való következtetésnek.

2) MEGÉRTÉS: Mit néz Nick és Marjorie a part mentén, ahogy eveznek a fok felé, hogy felállítsák horgásbotjaikat?

2 – Egy elhagyatott (faipari) malmot; a (faipari) malom alapjainak fehér mészkővonalát; egy leromlott/öreg (faipari) malmot; egy elhagyatott (faipari) kisvárost; Hortons Bay-t

1 – A part leírása; mocsaras burjánzást/mocsaras rétet; (faipari) malmot; DE nem említve a kisvárost vagy épületeket

0 – Bármely más válasz

3) MEGÉRTÉS: Hogy érti Nick, hogy “Nem kapnak”?

2 – A halak nem harapnak a csalira; a halak nem esznek; nem megy jól a horgászat

1 – Bármely válasz, amely megemlíti a horgászatot, de nem tartalmazza azt, hogy a halak nem harapnak a csalira

0 – Bármely válasz, amely nem tisztázza, hogy a halak nem harapnak a csalira, hogy nem megy jól a horgászat, vagy egyáltalán nem tesz említést horgászatról

4) MEGÉRTÉS: Miért van Nicknél és Marjorie-nél egy vödör élő sügér?

2 – Csalinak; halfogáshoz

1 – Bármely válasz, amely szerint a résztvevő érti, hogy a horgászathoz kell, de nem tudja pontosan megnevezni, hogy csalinak, halfogáshoz használják

0 – Bármely válasz, amely szerint a résztvevő nem érti, hogy a horgászathoz van rá szükség

5) MEGÉRTÉS: Mire következtethetünk Marjorie cselekedeteiből: arra, hogy tapasztalt vagy arra, hogy tapasztalatlan horgász? Miért gondolja így? *Győződjünk meg róla, hogy a résztvevő megpróbálja igazolni válaszát

2 – Tapasztalt/kissé tapasztalt/kissé tapasztalatlan (függően attól, hogy képességeit Nickhez vagy az emberek többségéhez viszonyítja) a következő lehetséges indoklásokkal: Marjorie azt mondja, szeret horgászni, elő tudja készíteni a csalit, a zsinórt a fogával tartja, tudja irányítani a csónakot, tudja, hol vesse be a zsinórt; habár tökéletesen elő tudja készíteni a csalit, vagy ugyanolyan jól mint Nick, mégis gyakran megkérdezi Nicktől, hogy jól csinálja-e, Nick gyakran kijavítja; csak kissé tapasztalt, mert folyamatosan kérdezetnie kell Nicket és nem olyan jól csinálja, mint Nick

1 – Kissé tapasztalt/kissé tapasztalatlan, szegényes indoklással (azaz a fentiek közül egyet sem említ); tapasztalatlan a fenti indoklások valamelyikével

0 – Tapasztalatlan indoklás nélkül; azonban ha a válasz az, hogy “tapasztalatlan,” de az indoklás után visszakozik és válaszát kissé tapasztalatra/kissé tapasztalatlanra módosítja, akkor válasza **1** vagy **2** pontot ér, függően az indoklástól

6) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Miért mondja Nick Marjorie-nek, hogy “Te mindent tudsz”?

2 – Nick szarkasztikusan/cinikusan/szándékosan gonoszán fogalmaz ÉS szeretné Marjorie-t felzaklatni/elszomorítani/feldühíteni/felbosszantani; Nick veszekedést próbál kiváltani vagy provokálja Marjorie-t, hogy ő szakítson Nickkel, így Nick hibáztathatná őt a szakításért

1 – Nick boldogtalan a kapcsolatban; szeretne véget vetni a kapcsolatnak; ideges/bosszús a helyzet/közelgő szakítás miatt; szarkasztikusan/cinikusan fogalmaz (nincs említés a következményekről, azaz arról, hogy Marjorie hogyan fog reagálni)

0 – Nick úgy gondolja, Marjorie okoskodó; Nick csak gonoszkodik; Nick egy gonosz ember

7) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Miért válaszol így Marjorie, “Ó Nick, kérlek, hagyd abba! Nagyon szépen kérlek, ne légy ilyen”?

2 – Marjorie tudja, hogy Nick veszekedést próbál kiváltani/szándékosan bosszantja őt, ő azonban nem akar összetűzésbe keveredni vele; Marjorie érzi, hogy Nick talán szakítani fog vele

1 – Korábban is hasonló jellegű beszélgetéseik voltak; Marjorie nem akar veszekedni; nem akarja elrontani ezt a szép napot

0 – Bármely más válasz

8) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Miért nem mer Nick Marjorie-re nézni?

2 – A válasznak utalnia kell Marjorie lehetséges reakciójára Nick mondandójával kapcsolatban; Nick tudja, hogy Marjorie-t felzaklatta/megbántotta a megjegyzésével és fél a reakciójától/nem akarja látni a bánatot az arcán; tart Marjorie róla alkotott véleményétől

1 – Bármely válasz, amely tartalmazza Nick érzéseit, de nem tartalmazza Marjorie reakciójának hatását Nick érzéseire; Nick kényelmetlennek érzi a beszélgetés irányának alakulását; szégyelli magát/szomorú/bűntudata van; most fog szakítani Marjorie-vel és könnyebb nem ránézni eközben; Nick fél attól, hogy rossz döntést hoz azzal, hogy szakít Marjorie-vel

0 – Nick nem akarja, hogy Marjorie lássa az ő reakcióját; vagy bármely más válasz

9) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Hogy érti Nick, hogy “Unom a dolgot”?

2 – Nicknek elege van a kapcsolatból; véget akar vetni a kapcsolatnak; a kapcsolatuk/szerelmük már nem szórakoztató; a kapcsolatuk már nem élvezhető/nem teszi őt boldoggá (a válasz tartalmazhatja példaként a horgászatot, hogy már semmilyen közös tevékenység nem szórakoztató; a válasz utalhat a kapcsolatra vagy a horgászatra is); nem akar már Marjorie-vel lenni (amennyiben a „vele lenni”-t a résztvevő a egész kapcsolatra érti, nem csak erre a horgászatra vagy erre a pillanatra)

1 – Bármely válasz, amely csak részben tartalmazza azt, hogy Nick elégedetlen a kapcsolatukkal, vagy a kapcsolatra vonatkozóan csak utalást tartalmaz, de nem tartalmaz kifejezett elégedetlenséget a Marjorie-vel töltött időt illetően

0 – Nick mondata csak a Marjorie-val való horgászatra vonatkozik; vagy bármely más válasz

10) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Miért ül Marjorie háttal Nicknek, amikor azt kérdezi, “Unod a szerelmet?”?

2 – Marjorie tudja, hogy Nick szakítani fog vele; fél Nick válaszáért, mert tudja, hogy az szomorú/fájdalmas lesz, nem az, amit hallani szeretne; próbálja megvédeni magát Nick válaszáért, mert tudja, hogy az fájdalmas lesz; fél megmutatni Nicknek hogy milyen sebezhető/megbántott/felzaklatott állapotban van

1 – Marjorie zaklatott/dühös/fél, hogy elsírja magát; kényelmetlenül érzi magát a beszélgetésben

0 – Bármely más válasz

11) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Miért viszi el Marjorie a csónakot (1 pont) és mit érez ő akkor (1 pont)? *Győződjünk meg róla, hogy a résztvevő megpróbálja a kérdés mindkét részét megválaszolni

2 – Marjorie ráébred, hogy a kapcsolatuknak vége; szeretne teret kapni; nem szeretné, hogy Nick sebezhetőnek/zaklatottnak lássa ÉS Marjorie zaklatott/szomorú/dühös/csalódott/elutasítva érzi magát (negatív affektus)

1 – Bármely válasz, amely nem teljesen és pontosan tartalmazza azt, hogy Marjorie ráébred, hogy kapcsolatuknak vége ÉS Marjorie dühöt/csalódottságot/szomorúságot stb. (negatív

affektust) él át – azaz a válasz magába foglalja Marjorie negatív érzéseit, de a szakítás megértését nem, vagy fordítva

0 – Bármely más válasz

12) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Kicsoda Bill, és mire utal, amikor azt kérdezi, “Elment simán? ... Nagy jelenet volt?”?

2 – Bill Nick barátja/szeretője; Bill tudta, hogy Nick szakítani fog Marjorie-vel és feltehetőleg Marjorie zaklatott/dühös lesz és veszekedni fog Nickkel

1 – Bármely reakció, amely félreértelmezi a Bill és Nick közti kapcsolatot (vagy csak annyit tartalmaz, Bill és Nick ismerik egymást) VAGY nem foglalja magába azt, hogy Bill előre tudott valamit

0 – Bármely más válasz

13) EXPLICIT ÉRVELÉS MENTÁLIS ÁLLAPOTRÓL: Mit érez Nick, amikor azt mondja, “Ó, menj el, Bill. Menj el egy kis időre?”?

2 – Nick bűnösnek/szomorúnak/zaklatottnak érzi magát, amiért megbántotta Marjorie-t (negatív affektus a Marjorie-vel való szakítás ténye miatt) és szeretne teret kapni az események feldolgozásához/nem akar a szakításról Billel beszélni

1 – Bármely válasz, amely leírja, hogy Nick negatív affektust él át, de ezt nem köti össze azzal, hogy megbántotta/felzaklatta Marjorie-t, szakított vele (a válasz tartalmazhatja, hogy Nick egyedül szeretne maradni), például: Nick zaklatott/szomorú/dühös és szeretne egyedül maradni

0 – Bármely válasz, amely CSAK azt tartalmazza, hogy Nick egyedül szeretne maradni/szeretne teret kapni a gondolkodáshoz/az események feldolgozásához; vagy bármely más válasz

14) MEGÉRTÉS: A történet címe “Valami véget ér.” Mire utal a cím?

2 – Nick és Marjorie kapcsolatának vége; az ártatlanság és boldogság vége; annak a vége, hogy saját tetteinkért/döntéseinkért más hibáztathassunk; a fentiek közül egy és (de nem feltétlenül kell tartalmaznia) Hortons Bay nyüzsgő faiparának vége/a malom működésének vége

1 – Bármely válasz, amely CSAK Hortons Bay-hez/a malomhoz kapcsolódó elmúlást említi

0 – Bármely más válasz

A Narrative Review on the Efficacy Studies of Social Skills Training for Patients with Schizophrenia with Special Focus on the Relationship between Social Cognition and Social Skills

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Introduction

Current literature that deals with social skills training conducted among schizophrenia patients indicates that topographical features and self-reports of discomfort and anxiety could significantly be influenced and changed for the better through the use of social skills training. Generalization and duration of these positive effects remain the important issue as these changes do not necessarily occur for every single patient and when they do occur, quite often they do not generalize to other, new situations (1).

The purpose of this article was first to look at the relationship between social cognition and social skills then to review the various definitions, methods and evaluation measures of social skills trainings then we look at these existing studies dealing with the efficacy of social skills training for schizophrenia patients that focused and explored the effects of generalization and documented follow-up examinations regarding these effects.

For over three decades, the availability of anti-psychotic drugs and various forms of community care have made possible for schizophrenia patients to be released from psychiatric facilities, the rate of relapse and the occurrence of rehospitalization have not diminished (2, 3), however a significant amount of progress has been made in documenting the effectiveness of social skills training strategies for schizophrenia. Our current report makes an effort – after

discussing definitions of social skills, social cognition, social competence and social skills training (SST) – to review and update literature from the past three decades as these studies – with the change of the century – progressively decreased to give way to other types of modalities. The significance of group psychotherapy and especially of the social skills training programs should not be excluded without reducing the importance of new interventions such as integrated psychological therapy (IPT) (2, 4) or other programs (cognitive behavioral therapies) focusing more on individual psychotherapy and cognitive rehabilitation such as Cognitive Enhancement Therapy (CET) which is an integrated approach (5–7).

What is Social Cognition?

Social cognition seems to be a main determinant of functional outcome and could be used as a guide to elaborate new pharmacological and psychological treatments (8). The research of social cognition appeared in the past decade when several studies concluded that they couldn't find strong enough evidence to base neurocognitive dysfunctions on potential endophenotypes of schizophrenia, that would have shown a strong relationship with the genetic background and being something, that could have been observed in unaffected biological relatives of schizophrenia patients (9). Other studies resulted in similar conclusions when

searching for (neurocognitive) endophenotypes in patients suffering from bipolar disorder (10). These results warranted further effort in order to develop new, more advantageous tests for cognitive assessment. Within the cognitive studies of schizophrenia – after the various researches of neurocognition –, social cognition has been gaining more attention. Recent meta-analysis concluded that social cognition was more strongly associated with community functioning than neurocognition, with the strongest associations being between theory of mind and functional outcomes (11). Deficits in social cognition and metacognition in schizophrenia patients make it difficult for them to understand the speech, facial expressions and hence emotion and intention of others, as well as allowing little insight into their own mental state. These deficits are associated with poor social skills, fewer social relationships, and are predictive of poorer performance in a work setting (12). Patients suffering from schizophrenia experience social cognitive deficits as well as negative symptoms and they contribute to their social dysfunction. Trying to treat these deficits in social competence has been a long-standing battle and from this battle, social cognition has emerged more recently as a high priority topic for exploration. Overall we can say that social cognition is a multifaceted construct that broadly refers to the mental operations underlying social interactions, including perceiving, interpreting, and generating responses to the intentions, dispositions and behaviors of others (13). Social cognition is typically broken down into 4 domains: emotional processing, social perception, attributional bias and theory of mind (14). Numerous research shows that there is a consistent relationship between social cognition and social functioning outcomes (15). Recent schizophrenia studies looking into the correlation between social cognition and negative symptoms showed that these two domains were separate and that high levels of social cognition and low levels of negative symptoms resulted in more positive social functioning outcomes (16).

What is the link between social skills, cognition and functioning in schizophrenia?

Social cognition consists of several skills which allow us to interact with other humans. “The term social cognition refers to those mental operations underlying social interactions, including perception, interpretation, and response generation to the intentions, dispositions and behaviors of others” (17). These skills namely are social stimuli processing, drawing inferences about others’ mental states (ToM – Theory of mind), and engaging in social interactions. In recent years, there has been growing evidence of social cognitive impairments in patients with schizophrenia (18). Schizophrenia, a severe and disabling brain disorder, is affecting 1% of the general population. Social dysfunction is the trademark of schizophrenia and a major burden on the individual and on their families (19). This mentioned social dysfunction in schizophrenia is characterized by deficits in social cognition and social competence – “which includes aspects of communication and sending skills; the verbal and non-verbal communication skills that allow successful execution of interpersonal interactions” (20). People with schizophrenia lack these skills because they either have not learned them or they have lost them in the course of their severe mental illness. The deficits in core social skills exist and show up in various forms, such as inappropriate style of social interaction, lack of spontaneity, missing clarity in conversation, or inept interaction and relationship with others (21).

What are social skills?

Given the key role of effective communication in obtaining one's needs for normal social functioning, the ability to interact with others in everyday life situations in order to achieve legitimate goals is essential. This ability is reflected by our social skills, which represent behaviors that enable us to have success in our everyday lives. The common basis for all defini-

tions of social skills trainings is an interpersonal context consisting of the patient, who is the focus of the definition and at least one other person (22). It should be pointed out, that social skills training programs' basic aim is to address deficiencies in social cognition and social competence in order to reach successful social functioning for patients suffering schizophrenia. There are four major elements of most definitions of social skills: (I) internal state of the patient; (II) topography of patient's behaviors; (III) outcome reflected in the achievement of goals, and (IV) the outcome reflected in the feelings, attitudes, behaviors of the other participants(s). (1, 23) R. P. Liberman defines social skills in terms of internal states and topography:

“the ability to express feelings or to communicate desires and interests towards others”.

According to *Hersen and Bellack* (1977) (24) social skills

“(is an ability to) express both negative and positive feelings in the interpersonal context without suffering consequent loss of social reinforcement. Such skill is demonstrated in a large variety of interpersonal contexts and involves the coordinated delivery of appropriate verbal and non-verbal responses....an overriding factor is effectiveness of behavior in social interactions.”

Trower, Argyle, Bryant (1978) (25) define social skills as the ability to

“understand other people's use of elements of expression... convey impressions through appropriate verbal and non-verbal behaviors... ability to affect behaviors and feelings of others in ways the person intends and which are socially acceptable....ability to influence environment sufficiently to attain basic personal goals”.

Guilford (1967) defined social skills in terms of several elements of behavioral cognition, while *Spivack, Platt and Shure* (1976) called them “interpersonal cognitive problem solving skills” (1).

What is Social Skills Training?

Social skills training is a broad-based program designed to teach a wide variety of social skills. During the 1970s social skills training emerged as an educational and clinical modality for improving social behavior or performance of people with mental disability. Social skills training, a psychological approach, utilizes a number of behavioral principles and techniques – which is why it is sometimes referred to as behavioral skills therapy –, such as problem-solving, role play, modeling, direct instruction, coaching, feedback, verbal reinforcements, rehearsal, home assignments (2). Complex social behaviors are broken into smaller sets of behavioral elements so they can be learned easily in a systematic and progressive way through structured trainings settings. Social skills training aims to help individuals with serious and persistent mental disabilities to “perform those physical, emotional, social, vocational, familial, problem-solving and intellectual skills needed to live, learn and work in the community with the least amount of support from agents of the helping professions” (26–28). Social skills training is used to enable individuals to learn specific skills that are missing or that will compensate for the missing ones. (These types of trainings have better outcomes based on treatment adherence in terms of better results (29). These trainings consist of learning various activities utilizing behavioral techniques that enable persons with schizophrenia to acquire interpersonal disease management and independent living skills for improved functioning in order to enhance their quality of lives (30). *Robert Paul Liberman* – the most prominent proponent of social skills training- designed a systematic skills training program (SILS) consisting of eight modules with different topics (e.g. medication management, symptom management, community re-entry, recreation for leisure, basic conversation skills, substance abuse management, friendship and intimacy, workplace fundamentals skills module) with each topic focusing on something relevant to the patient's life (2, 6, 31).

Bellack in 1997 published a practical training manual on social skills (32–34).

What are the various parts of a prototypical social skills training?

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The basis of social skills training is derived from social learning theory (35), and operant conditioning (36) techniques and the principles emphasize the importance of setting clear expectations with specific instructions, coaching through prompts, modeling or vicarious identification, positive feedback or reinforcement for smaller improvements in social behavior (1). Trainers also give homework assignments to individuals in order to practice the skills acquired during the trainings at home, community, workplace or other in vivo settings (2, 37). The skills are to be learned slowly, repetitively and consistently with the help of techniques such as error-free learning, shaping and overlearning (38, 39, 2, 6).

What are the various measures of evaluation?

A few studies have evaluated the effects of the training on the patient's internal states and assessed in terms of self-reports or social competence in social situations, while others used standardized role play situations and variables such as duration, eye contact, response latency, length of interaction have been measured (1). Very few studies have evaluated social skills trainings in terms of effectiveness in social situations in terms of goals and also a few studies evaluated the effects of the training from others perspective and opinions about the patients (outside responses and measurements to the patients).

Method

Electronic searches of MEDLINE, PUBMED, PsychINFO, PLoS were undertaken looking for the following keywords: “social skills training”,

“social skills training AND schizophrenia”, “effects of social skills training AND schizophrenia”, “social skills training OR cognitive social skills training and schizophrenia”, “social skills”, “psychosocial functioning”, “social cognition”, “social competence”, “psychiatric rehabilitation”, “generalization”, “review”, “meta-analysis”. Additionally the general search engines on the internet such as Google Scholar were used. Some relevant studies were also searched manually in the Journals. All reference lists of the selected articles were searched for further relevant trials. Review articles were also scanned. Finally only those articles made it into our research which dealt with empirical studies using randomized controlled trials regarding social skills trainings. In order to reduce potential bias in the selection of relevant intervention studies regarding efficacy of social skills training in schizophrenia, only studies conducted with randomized controlled trials or controlled trials were included and was published between 1981 and 2015 in English and in Hungarian.

Results

From the comprehensive search results, in total 26 studies, 8 reviews and 7 meta-analyses were considered as relevant. Social skills training has the longest history of all psychosocial interventions for schizophrenia and it has been used since the 1960s. Some authors state that the operant conditioning-based token economy is the first used intervention to focus on social behavior of people suffering schizophrenia (30). These early social skills training strategies for schizophrenia, which are reviewed by *Donahoe and Driesenga* (40) were modifications of assertive training approaches originally developed for individuals with passive and inhibited lifestyles. Outcome was assessed primarily with role play measures of behavioral topography (speech duration and latency, eye contact, gestures) and molar skills (assertiveness, managing compliments). In nearly all of these studies the interventions led to signifi-

cant improvements in measures of topographical skills (41). In several of these studies maintenance of skills was documented for periods of several weeks to 24 months. Methodological weaknesses included the use of assessment strategies that were similar to the training strategies as well as failure to assess if acquired skills generalize to natural settings. Additionally documentation regarding the use (and duration) of antipsychotic medication also lacks clarity and precision.

There was a great rise of social skill training interventions in the 1970s designed and led by *R.P. Liberman*. He was the first to introduce role-playing, coaching, modeling and problem-solving and designed several modules (namely 8) known as the UCLA Skills Training Modules (SILS) as part of their psychiatric rehabilitation program (42). Their approach was based on problem-solving focusing on receiving, processing and sending skills. This study is translated into 23 languages and is used in 6 continents (42).

The role of training sustained attention in patients with poor social skills was the 1990s' main focus. According to their findings training sustained attention can lead to learning and teaching basic conversation skills through repetition. Also in the 90's Brenner (1994) came up with the Integrated Psychological Therapy (IPT) as a significant approach for the cognitive model and *Hogarty and Flesher* (5) created the Cognitive Enhancement Therapy (CET) (1999) – both of which are great examples of the training of social and neurocognitive abilities associated with social skill trainings (22).

Efficacy results

Current search results indicate that a majority of published studies on the efficacy of social skills training in the literature are of other core psychiatric disciplines. The majority of these included studies were either randomized controlled trials or controlled trials though some of them were smaller sample size trials. The implemented social skills training inter-

ventions were either in traditional format (conversational skills, assertive skills, independent living skills, interpersonal relationship skills etc.) or in cognitive format (cognitive behavioral therapy, attention training, neurocognitive training, cognitive remediation). In most of these studies group sessions included small groups of 5–8 participants. The duration of sessions were ranged from 45 to 70 minutes with a frequency ranging from once a week with up to three sessions per week for a period of minimum of 4-8 weeks with mostly male participants with schizophrenia diagnosis.

Findings of previous studies showed that social skills trainings were effective especially in terms of skill acquisition and performance of skills taught in class or in clinical settings. (43) Additionally several findings indicated significant levels of positive generalization of skills and improvement in social adjustment and social functioning (2, 6).

Several findings showed particular skill improvements such as conversation and problem-solving skills, assertiveness and some studies reported reduced negative symptoms (e.g. social isolation, lack of motivation, apathy and loss of enjoyment) not to mention the increased levels of self-esteem participants in the experimental groups reported after the trainings. (24, 44)

Family therapy and assertive community treatment have clear effects on the prevention of psychotic relapse and rehospitalization, however these treatments have no consistent effects on outcome measure such as positive and negative symptoms, social functioning, ability to maintain employment (5, 6). Social skills training improves social skills but has no clear effects on rehospitalization and relapse.

The 7 meta-analyses we looked at showed inconclusive results on the efficacy of social skills trainings. *Pilling et al.* (45) published a meta-analysis including 9 randomized controlled trials and concluded that social skills training and cognitive rehabilitation do not seem to provide clear benefits for patients with schizophrenia. 2 important meta-analyses from 1991 by *P.W. Corrigan* (46) and from 2008 by *Kurtz & Mueser*

Table 1.

study	number of partic.	experimental	control	age	gender*	medication	duration/frequency	outcome measures	results	followup
1990 Mueser et al.	115	acutely ill in-patients	within group pre and posttest	NR	NR	NR	NR	Standard SST (4-5 sessions)	compromise, negotiation, affect expression skills improved, best at those who participated in role plays	NR
1991 Hogarty et al.	103	schizophrenia patients SST	supportive therapy	27	66	NR	1x/week for 1 year relapse rate	NR	SST had 20% relapse rate compared to 41% in supportive therapy	NR
1992 Wallace, Liberman et al.	108	schizophrenia patients SST	waiting list control	33	82	NR	13-20 weeks twice a week	UCLA social and instrumental skills training modules	skills improved, no perfect learning outcome maintained skills	1 year FU no decline, maintained skills
1992 Eckman et al.	41	schizophrenia patients SST	group psychotherapy	NR	NR	NR	18 months for twice a week for 6 months	UCLA medication and symptom self-management modules	significant symptom improvements in both	NR
1993 Wong, Massel, Martinez-Diaz et al.	3	schizophrenia patients SST	group psychotherapy	24-33	NR	neuroleptic medication	20-30 mins 4 times a week	conversational/verbal skills in office then in vivo	response rates were higher in office than in naturalistic settings	3 month FU no decline in certain personal target skills
1995 Halford et al.	38	subacute schizophrenia within group pretest and posttest	NR	NR	NR	NR	70 weeks	5 UCLA skills training modules	reduced psychopathology and negative symptoms, improved quality of life	NR
1995 Hayes et al.	63	subacute schizophrenia SST	discussion group	NR	NR	NR	twice a week for 18 months	NR	SST greater increase in targeted social skills, relapse did not differ	6 month FU groups improved in social functioning and positive symptoms
1995 Jerrel and Ridgely et al	132	no diagnosis, behavioral skills training	12 step recovery or case management	NR	NR	NR	NR	NR	SST demonstrated the most positive and significant changes in psychosocial functioning	24 month FU

Table 1.

study	number of partic.	experimental	control	age	gender*	medication	duration/frequency	outcome measures	results	followup
1995 Dobson et al.	28	schizophrenia patients SST	social milieu treatment	NR	NR	NR	60 mins for 9 weeks	NR	SST showed greater improvements in social functioning and overall psychiatric symptoms, effects gradually declined after SST ended	NR
1996 Smith et al.	44	acutely ill in-patients	within group pre and posttest	NR	NR	NR	NR	community re-entry and outpatient treatment compliance skills	NR	2 week FU 70% exhibited compliance
1996 Marder et al.	80	schizophrenia patients SST	supportive group therapy	40	100	random assignment to fluphenazine, supplemental oral flu. Or placebo	6 months twice a week, for 18 months once a week	social adjustment and psychotic relapse (BPRS scale)	SST group had better personal well being and total adjustment, reduced symptoms and side effects, early age at onset important effect on social adjustment outcomes, SST useful adjunct to pharmacotherapy for some patients	NR
1998 Liberman et al.	84	schizophrenia patients SST	occupational therapy	NR	NR	NR	12 hs per week for 6 months then 18 months assertive case management	UCLA conversation, recreation, medication and symptom management modules	NR	2 year FU SST demonstrated significantly greater knowledge and performance skills related to SST modules
1998 Meder et al.	97	schizophrenia self-management training	educational control group	NR	NR	NR	3 month trial	NR	both groups higher knowledge and skills test than TAU groups	NR

Table 1.

study	number of partic.	experimental	control	age	gender*	medication	duration/frequency	outcome measures	results	followup
1998 Kopelowicz et al	59	no diagnosis, SST	occupational therapy	35	71	NR	8x45 mins 4 weeks 6-8 people per group	test of knowledge, attendance, aftercare service	better knowledge, 85% were likely to attend 1st aftercare appointment	NR
1999 Smith et al.	32	no diagnosis, SST	supportive group therapy	35	56	antipsychotic medication	3-4 weeks, once a week	21 question skills measure	performance improved	NR
2001 Liberman, Eckman, Marder	75	schizophrenia social problem-solving group	supportive group therapy	38	90	chlorpromazine-equivalent dosages of antipsychotic medicine	4 months, once a week, 4-6 people	AIPSS pre and post intervention	SPS improved problem-solving in the selection of alternative, in the quality of verbal and non-verbal skills, overall quality of role play performance	NR
2001 Tsang and Pearson	97	no diagnosis, basic social skills and core work-related skills	TAU	36	55	NR	2,5 months 10 session once a week	NR	work-related social competence advantage of both groups	greater number working after SST- 46,7%
2002 Blair et al.	80	no diagnosis, random assignment SST	in clinic IVAST	NR	NR	NR	NR	NR	IVAST patients learned problem solving skills more quickly and showed better social adjustment after therapy	NR
2003 Chien	84	no diagnosis, SST	routine nursing care treatment	42	43	NR	4 weeks, twice a week for 60mins	converaation and assertive skills	skills improved, no perfect learning outcome	1 month FU improvement sustained
2005 Granholm et al.	76	no diagnosis, CBSS	TAU	54	74	antipsychotic medication	NR	independent living skills survey, symptoms	SST participants engaged in more social functioning activities, improved cognitive insight, reduced positive symptoms	NR
2005 Mueser et al.	35	no diagnosis, workplace-fundamental skills module SST	supported employment control	38	80	NR	3-4 month trial once a week and FU sessions	employment outcomes and vocational services tracked for 18months	SST clients with greater learning on knowledge test	NR

Table 1.

study	number of partic.	experimental	control	age	gender*	medication	duration/frequency	outcome measures	results	followup
2006 Patterson et al.	240	no diagnosis, skills training in medication management, social and communication skills, financial management	attention control	51	59	antipsychotic medication	6 month for once a week	functional and social skills, symptoms	experimenter groups showed improvement on total scores	NR
2007 Valencia et al.	82	no diagnosis, symptom and medication management	TAU	30	78	NR	48 weeks once a week	symptoms, relapse, compliance with medication	improved symptoms, lower relapse, higher compliance with medications in SST group	NR
2008 Silverstein et al.	82	no diagnosis, UCLA basic conversation skills module	BCSM and attention shaping	18-55	60	chlorpromazine	twice a week 1 hour	parameter characterizing attentive behavior displayed by subjects, pre and post change of scores in Comprehensive Module Test for BCSM	BCSM+AS higher degree of attentiveness, greater improvement, degree of change, skill acquisition	NR
2009 Galderisi et al.	30	no diagnosis, SSANIT	SLA	NR	70	2hs once a week for 6 months	SANS test and SAPS test, cognitive abilities, attention, memory, executive functions, verbal fluency, personal and social functioning	NR	NR	FU retest no less than 1 month after-no difference at baseline, SSANIT less disability signs and lower number of dropouts
2011 Horan et al.	68	no diagnosis, random assignment to: SCST, hybrid intervention, UCLA SST	NR	NR	NR	NR	12 weeks twice a week	assessing social cognition, neurocognition, functioning outcome	SCST results greater improvement in emotion processing	NR

NR – no record; **SST** – social skills training; **TAU** – treatment-as-usual; **FU** – follow-up; **gender%**; **SPS** – social problem-solving skills; **AIPSS** – assessment of interpersonal problem-solving skills; **IVAST** – in-vivo amplification of skills training; **SSANIT** – social skills and neurocognitive individualized treatment; **SLA** – structured leisure activity; **SANS** – skills assessment of negative symptoms; **SAPS** – skills assessment of positive symptoms

(47) – after having analyzed 23 randomized controlled trials (*Kurtz & Mueser*) and 72 RCTs (*Corrigan*) – concluded that their results support the efficacy of social skills training for improving psychosocial functioning in schizophrenia while *Pfammatter, Junghan and Brenner* (48) found that social skills training consistently influences the acquisition of social skills, family interventions decrease relapse and hospitalization rates and CBT (cognitive behavioral therapy) results in reduction of negative symptoms. Another meta-analysis by *Benton and Schroeder* concluded that while the benefits of social skills training are stronger for improvements in social skills and social functioning, significant effects were identified for symptom improvement, acceleration of discharge from the hospital and reduced relapse rates (49, 50). *Almerie et al.* (51) meta-analysis reviewed 17 reports describing 13 RCTs and found that rates of relapse, quality of life, social functioning measures, rehospitalisation favored SSTs over standard care protocols, however, when compared to a discussion group control, no significant differences were found in social functioning, relapse rates, quality of life and mental state. *Dilk and Bond* reported in their meta-analysis that weeks of training correlated significantly with effect size and clinical outcome (52).

Overall it has been stated by all 7 studies, that further open questions remain as to the generalization of findings to psychiatric care and there is still room for improvement in order to expand the effect of mentioned intervention to improve clinical outcomes in the long run. Despite some evidence that trained skills can be maintained over time, relatively few studies have addressed the question of long-term treatment outcome (6).

Conclusion

Social cognition is increasingly viewed as a viable treatment target. This is in large part due to a growing body of evidence demonstrating that social cognitive abilities contribute to real-

world outcomes and that remediation of social cognitive impairments leads to improvements in functional outcomes (53). Our review describes current researches on social cognition and psychosocial skills training methods for schizophrenia that were introduced at several psychiatric units. Previous research work demonstrated the efficacy and usefulness of social skills training interventions for patients with schizophrenia so generally can be said, that there is no indication that these kinds of social skills training interventions do any harm therefore could be implemented in routine psychiatric care combined with antipsychotic medication and other psychosocial therapies particularly family psychoeducation (51). Overall – compared to standard care – more research supports the efficacy of social skills training for schizophrenia and other serious and persistent mental disorders with good results in terms of quality of life, mental state and social functioning, however the evidence is still very limited with data rated at low quality (1, 6).

There is some evidence that skills training leads to skill acquisition and maintenance in schizophrenia, especially if it is intensive and of sufficient duration. There is evidence that those programs that add psychosocial approaches to the drug treatment are more effective in reducing relapses and improving social functioning. Two meta-analyses, conducted by *Pilling et al.* (45) that was published in 2002 and by *Almerie et al.* (51) in 2015, concluded that social skills training and cognitive rehabilitation do not seem to provide solid and clear benefits for patients with schizophrenia.

Data supporting the effectiveness of social skills training methods continue to accumulate, however, more reliable evidence is needed if social skills training interventions are to be incorporated into the treatment of patients with schizophrenia. These programs introducing and implementing skills training methods should remain since findings considered in this review show where and how these interventions can be applied to improve functioning for schizophrenia patients, however, cautious

optimism is warranted regarding future directions and development of these implementations as questions such as generalization, motivation. These moderate results could be due to the deficits in methodology as they all try to measure various components of the very complex human behavior hence the study of social skills training generalization is so arduous. Whatever patients learn in group settings do not necessarily and always transform into real life “in vivo” settings and even if they do, it is rather difficult to measure these occurrences during follow ups. There are several other potential explanations for the less than satisfactory generalization of social skills trainings to real life situations such as the longevity and duration of the training which is often less than 20 hours – this is rather brief and may offer too little practice to firmly establish skills (1). Further research could focus more on where spontaneous generalization occurs and why and where it does not and draw conclusion from them occurrences and allowing them to fill in the gaps assessing acquisition measures leave behind.

Measurements such as positive-negative symptoms, behavioral adaptation, relapses, length, durability, executive functions, efficacy of treatment, likelihood of attending post-discharge care, test of knowledge/performance could be found in the articles, reviews and meta-analyses we looked at in this review. Factors such as cultural differences, the inclusion

of patients' families and care, indication of medication use, age range, gender, status of in-and outpatients etc. should be taken into account and consideration when planning such studies. Additionally certain methodological flaws occur in a lot of these studies such as unspecified psychopathology, lack of description of the patients, no control of medication, various durations, heterogeneity of diagnostic practices in terms of included illnesses etc. (1) These practices make it extremely difficult to compare studies and resolve contradictory findings.

Although there is moderate evidence for generalization of learned skills to overall social adjustment, highly focused approaches that target narrowly defined skill areas are more likely to lead to generalization than strategies that teach generic social skills such as assertiveness therefore generalization of findings should be done with caution. Further research must be directed to determining the interaction between the patient characteristics and training procedures as they affect outcome. Additionally, several studies showed that in vivo social skills training (IVAST) is more effective than conventional analogue skills training, however the implementation of these techniques alone carry many challenges as these procedures occurred primarily in closed settings where mental health professionals provide services. (37, 43, 44).

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Persons With Schizophrenia Misread Hemingway: A New Approach to Study Theory of Mind in Schizophrenia

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Introduction: Theory of Mind (ToM) is a key component of social cognition. Recently the Short Story Task (SST) was developed as a new measurement of ToM. SST uses a short story of Ernest Hemingway to assess ToM skills. SST proved to be a suitable tool, and sensitive to individual differences among healthy subjects. Our aim was to test SST to evaluate the ToM skills of persons with schizophrenia.

Materials and Methods: SST was used to assess ToM skills. After reading the short story “The End of Something” a structured interview was done with 14 questions. Spontaneous mental state reasoning, explicit mental state inference and comprehension of nonmental aspects of the story were evaluated. 47 persons with schizophrenia in remission and 48 healthy controls were assessed and compared.

Results: Persons with schizophrenia performed significantly more poorly in the explicit mental state inference questions. Ceiling effect was not detectable in explicit ToM scores. Patients made less spontaneous mental state references as well, although the occurrence of spontaneous mental state terms was infrequent in both groups. Patients were also less accurate in answering comprehension questions, but the difference was not significant after Bonferroni correction.

Discussion: Our results lined up with the original findings and we found SST to be a sensitive tool to explore the individual differences in ToM performance, not only among healthy subjects, but also among persons with schizophrenia especially in explicit mental state inferences without observing the ceiling effect. We found, however, SST to be less sensitive to measure spontaneous mental state reasoning and also the lack of the use of another ToM test to assess convergent validity of SST for indicating ToM deficits in schizophrenia stands as a limitation of current study.

Keywords: schizophrenia, Theory of Mind, ToM, reading, mental state reasoning, literature, Short Story Task

INTRODUCTION

Literature, especially literary fiction, is an excellent way of practicing Theory of Mind (ToM), since it is characterized by using narrative content that prompts the reader to guess rather complex social situations, where the motivation of the characters and/or the causality of the events are not described directly or explicitly. The narrative comprehension of these scenarios usually requires the use of ToM skills, because the reader is required to make mental state inferences to understand the events and the characters' intentions. An interesting approach has been published recently that suggested literary fiction as a potential tool to assess ToM performance (1) and they used a short story to assess ToM skills (Short Story Task, SST) (1).

ToM is the ability to attribute mental states (such as beliefs, knowledge, intentions, emotions) to the self and others, and hence it allows to explain and predict behavior (2, 3) while being a key component of social cognition. Theory of mind has two major components: its implicit and its explicit form. Implicit ToM is automatic, fast, decoded without awareness, non-verbal, and so it is an intuitive mental state attribution (4). The implicit ToM is present in the early life, possibly from birth (5, 6). Explicit ToM, in contrast, is relatively slow, relying on verbal processing, more controlled and conscious, deliberative, and inferential (4, 7). Compared to implicit ToM, explicit ToM develops later, and closely tied to language acquisition and executive function development (5). Explicit ToM is usually measured by tasks relying heavily on verbal abilities and they usually contain explicit instructions for attributing mental states (8). The term, spontaneous ToM is also used in social cognitive research. Spontaneous ToM is the processing of social information without explicit instruction (9). The concept of spontaneous ToM overlaps with the implicit ToM, however according to Senju (9), spontaneous ToM does not require the lack of conscious awareness. It is also not an obligatory processing unlike automatic processing, so it can be interrupted by competing cognitive tasks (9). It can be conceived as a lower level and early phase ToM processing with an emphasis on mental state decoding (4). Usually the spontaneous ToM activity is tested with animated geometric forms stimuli, and measured by multiple choice questions (8, 10, 11), or with question not directly asking the subject to reflect upon mental states (7). These types of ToM tasks are also used as indirect measures of verbal mental state attribution indexed by the spontaneous use of mental-state language (7) (e.g. feels, thinks, wonders, furious, anxious, etc.) in tasks when the participants are not cued (unlike in explicit ToM tasks), and responses are spontaneous (1, 7).

The concept behind the idea to use literary fiction as an assessment tool was to make a test sensitive to spontaneous and explicit ToM as well as to small individual differences so that the ceiling effect could not be detected. Ceiling effect, when participants perform near perfectly, is quite frequent in ToM research. They also considered it important to include a range of complexity tasks in order to use a social situation similar to reality and to be easily and quickly recruited and evaluated. Literary fiction is very similar to everyday situations: it is about a

dynamically developing, complicated, lifelike social situation, where the understanding of the mental aspects is essential for the comprehension of the entire story. In order for the reader to interpret the story, one must draw conclusions about the thoughts, emotions and intentions of the characters just as in everyday situations (1).

A substantial body of evidence suggests, that persons with schizophrenia are impaired in their abilities to attribute mental states to others (12–14). Research results confirmed that ToM impairment does not only exist during acute episodes as a state variable, but it is also constantly present between the episodes as trait-marker (12). ToM deficits in schizophrenia could be conceived as a phenotypic impairment (13, 15), it precedes the onset of the disorder, and it is not only present in the acute psychotic states, but also during remission (13). High-risk individuals show lower ToM performance with blunted trajectory from age 17 onward (16). It can be also detected in nonaffected relatives with genetic risk, they usually have intermediate performance between persons with schizophrenia and healthy controls (13, 17). Genetic associations with ToM deficits were also revealed during the last decade (13). According to literary data, the resulting ToM deficit is independent of age and gender (14) and—although not specifically addressed so far—an association of ToM impairment with medication seems at least unlikely (18). Cross cultural studies also revealed that ToM impairment in schizophrenia is present across cultures (11, 19). It is also assumed that not only the understanding of others is impaired, but patients also have a disturbed capacity to relate their own intentions to executing behavior, and to monitor others' intentions (20).

Most available research studying schizophrenia investigated the explicit ToM skills, which were found extensively deficient. Relatively few studies focused on implicit and spontaneous ToM. Roux et al. found (21) preserved implicit mental-state attribution measured by eye-tracking, whereas explicit performance was impaired, however, they also detected slowdown of social context processing during intention attribution with a similar paradigm (22). Other investigations—which used animated geometric forms stimuli—found deficient spontaneous ToM skills characterized with incorrect social inferences in schizophrenia (8, 10, 11, 23). Other studies with animated geometric forms reported fewer patient generated mental-state terms (7, 24, 25). The reduced unprompted mention of mental states reflected a relative insensitivity to salience of mental state information.

There is a strong link between social cognition, functional outcomes and quality of life (26, 27). In schizophrenia, ToM deficits are difficult to overcome and improve, while adequate social cognitive abilities are indispensable for proper social functioning. In light of the importance of social intelligence including mental state attribution skills in human evolution, it seems straightforward to assign mental state attribution a specific role in social functioning (28).

In the past decades, numerous tests have been developed to measure ToM. Overall it can be stated, that there are so many tests and methods, which successfully examine and measure

ToM, that it would go beyond the scope of this article to give a fully detailed listing on them. The different methods were reviewed excellently in several publications [for detailed review see (1, 29, 30)]. These measures and other methods of analysis usually clearly distinguish persons with autism, bipolar disorder, schizophrenia, etc. from the healthy population based on their marked ToM deficits. Most of these tasks, however, were primarily developed for children and may not be challenging enough to assess adults. These tests could often only detect serious impairments, and the tiny individual differences—even among healthy individuals—would remain hidden. The additional disadvantage of these methods is that members of the healthy control groups often perform 100% or nearly 100% so ceiling effect can be detected. Ceiling effect is a common phenomenon in ToM research in schizophrenia as well, when healthy controls are involved in a study, as they usually perform above 90% in several studies (1, 30). Even early detection of the slightest deficit could, however, significantly advance preventive and diagnostic activities. Unaffected first-degree relatives or individuals with high-risk state for psychosis usually exhibit milder forms of ToM impairments (31), but even persons with schizophrenia exhibit varying degrees of ToM deficits (28).

Additionally, the greater part of ToM studies are limited to studying explicit ToM so the participant is instructed to make ToM references. In these tests, spontaneous ToM, where the participant is not specifically instructed to make references for mental states, is usually ignored (1), however recent studies addressing spontaneous ToM have been emerging (7, 8, 10, 11, 23–25).

The main purpose of this study was to test the applicability of the new SST (1) to measure the ToM skills of persons with schizophrenia. It was hypothesized that significant differences would be detected in the explicit ToM scores between the persons with schizophrenia and the control group participants. We also presumed that there would be significantly more spontaneous ToM references among healthy subjects than among patients. We also hypothesized, that there would be no significant differences in the participants' comprehension skills in terms of the short story. Finally, based on the previous results, we did not expect to observe a ceiling effect in mental state reasoning in both groups.

MATERIAL AND METHODS

Participants

The persons with schizophrenia (schizophrenia group, SG) were recruited from outpatient psychiatric services and from the outpatient units of inpatient psychiatric cares from three cities (Pécs, Mohács and Szigetvár) in Hungary. All the patients were treated with the diagnosis of schizophrenia fulfilling the diagnostic criteria of DSM-5. Two experienced, senior psychiatrists reviewed the psychiatric history of the patients to confirm the diagnosis. Diagnosis was also confirmed by Module B and C of SCID-5 (Module B: Psychotic Symptoms, Module C: Differential Diagnosis of Psychotic Disorders) (32). Patients were on maintenance antipsychotic treatment. Patients received first

generation antipsychotics (8 persons), second generation antipsychotics (28 persons), or they were on combination treatment with two antipsychotics (11 persons). The chlorpromazine equivalent dose was 371.21 mg (SD: 201.62). Inclusion criteria were: age older than 18; being native Hungarian speaker; no evidence of substance abuse (excluding caffeine and tobacco); no neurological disorder or mental retardation or cognitive deficits unrelated to schizophrenia. All the subjects living with schizophrenia were treated as outpatients, there were no changes in the medication of the participants during the study and in the antecedent last 6 months. We intended to assess a clinically stable patient population fulfilling the criteria of remission to minimize the confounding effect of symptoms. According to the remission criteria of schizophrenia (33), remission was confirmed with the eight items (P1, P2, P3, N1, N4, N6, G5, G9) of Positive and Negative Syndrome Scale (PANSS), which were mild or less (≤ 3) for at least 6 months before entering the assessment. Sixty two patients with the diagnosis of schizophrenia in a clinically stable state according to the judgement of their treating psychiatrist were recruited. Fifteen patients were ruled out, as they were not in remission according to the remission criteria of schizophrenia. The final sample comprised of 47 subjects (23 males and 24 females).

The control group (CG) consisted of 48 Hungarian-speaking healthy individuals (19 males and 29 females), enrolled from the general community through online recruitment. Inclusion criteria for the CG were the following: age older than 18; being a native Hungarian speaker; no evidence of substance abuse (excluding caffeine and tobacco); no neurological disorder, no earlier treatment due to psychiatric disorder. CG was also screened with SCID-5 to exclude the presence of a psychiatric disorder. Age, sex, ethnic origin and educational status were matched to the characteristics of the patients' group to minimize interindividual variability.

The psychiatric history review, the assessment of remission, and SCID-5 were carried out by two senior psychiatrists (R. Herold, T. Tényi) trained in SCID-5 and PANSS assessment. The interrater reliability of them was tested in our earlier study for SCID and PANSS, and the kappa coefficient was >0.75 (34).

After a detailed description of the study was presented to the subjects, written informed consents were obtained. Patients were aware of the study's aims and hypotheses. The investigation was performed according to institutional guidelines. Ethical perspectives were established in accordance with the latest version of the Declaration of Helsinki. The study design was approved by Committee on Medical Ethics, University of Pécs (ethical permit number: 6539).

Experimental Task

For the present investigation, SST was used, previously developed by Dodell-Feder et al. (1) for ToM investigation in healthy participants. The SST consists of a short story and a Short Story Task Administration and Scoring Materials. This supplementary document involves instructions for the participants, the questions, and scoring instructions. The original English version of the supplementary document can be

downloaded from the publishing site (<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0081279>).

The test was adapted to Hungarian. We translated the instructions, the questions and the evaluation criteria, then a bilingual native speaker was asked to translate it back to English considering the intercultural differences. ToM skills were analyzed through a structured interview after reading the short story. The instructions were modified on the basis of the ex-post recommendations of the US task force. The original study demonstrated that SST is sensitive to variations in ToM performance, it can be rated accurately by different raters, and SST showed convergent validity with other ToM measures (1).

Participants read a short story, *The End of Something* by Ernest Hemingway, which presented an interaction between a romantic couple, Nick and Marjorie. This particular short story has been chosen for this purpose because the text is easy to understand (1). We used a published Hungarian translation of the short story (35). Throughout the story the couple followed the stages of a breakup however the mental lives of the characters were not explicitly described so the reader was forced to make mental state inferences by picking up clues from the various nonverbal and indirect communication between the characters.

Before reading the story, the participants were given verbal instructions, then afterwards were asked a series of open-ended questions. They were allowed to refer back to the story as needed to eliminate memory demands. In these instructions, readers were asked to highlight the characters' thoughts, feelings and intentions. The investigator gave no feedback regarding the participant's responses.

The task was presented verbally by one of the investigators in the form of an interview in one session for all participants individually. Each interview was recorded, and the recorded data were scored by two independent investigators (it was done by J. Fekete, and E. Varga). The interrater reliability was tested, and the kappa coefficient was >0.90 in the pilot study. According to the original study, scoring was completed by the first author, using the transcripts, then 25% of the transcripts were chosen at random and scored by a second independent rater (1).

The structured interview of SST involved 14 questions regarding three areas: five comprehension questions, eight explicit mental state reasoning questions, and one question to assess spontaneous mental state inference (1). Comprehension questions were designed to measure the understanding of the nonmental state content, while explicit mental state reasoning questions assessed the mental state inferences, and the understanding of non-verbal or indirect communication. To assess spontaneous mental state inference question, participants were asked only one open-ended question: to summarize the story in their own words. In this particular question responses were coded according to the presence or absence of mental state inference, without drawing special attention to what the question actually measures.

The answers for the questions were scored from 0 to 2 (except from the spontaneous mental state inference question, which is scored from 0 to 1: absence or presence of mental state inference). Zero (0) point was given when the answer was

incorrect or when there was no answer. 1 point was given when the response demonstrated partial understanding, when the participant needed questions to clarify or when the participant gave very few examples. Two points were given when the responses demonstrated full understanding and the experimenter gave more than two examples.

Statistical Analysis

The IBM Statistical Package for the Social Science [SPSS; SPSS Inc., Chicago, IL, USA (36)] Statistics version 24 for Windows was used for statistical analysis. In the statistical analysis, as we made multiple comparisons according to Bonferroni correction, $p < 0.01$ was considered significant. We used independent samples t-test, ANCOVA and non-parametric Mann-Whitney U test to calculate the differences between the persons with schizophrenia (SG) and the control group (CG) for clinical and demographic data. We used Chi-square test to examine gender difference between the two groups. We performed linear regression to assess the effects of demographic data on explicit ToM.

RESULTS

Demographic data are summarized in **Table 1**. There was no significant difference in age ($p = 0.942$, not significant, n.s.), years of education ($p = 0.243$, n.s.), and gender ($p = 0.759$).

Persons with schizophrenia performed—statistically by average—less accurately than control subjects in the comprehension questions, but it was not statistically proven after the Bonferroni correction had been performed ($p = 0.050$) (**Table 2**).

In the other two measured factors, namely in the explicit mental state reasoning questions ($p < 0.001$), and in the spontaneous mental state inference question ($p < 0.001$), the control group achieved significantly higher scores than the persons with schizophrenia (**Table 2**).

Following this, the explicit ToM scores were analyzed using linear regression in the two different groups. Both models exist according to **Table 3**, as the global F test's ANOVA values are under 0.01, and the explanatory powers are higher than 0.3, prompting the investigators that the models are satisfactory to draw conclusions. According to our findings, explicit ToM is not significantly influenced by age ($pc = 0.036$, $ps = 0.076$), education

TABLE 1 | Demographic data in the CG and the SG.

	Control Group (CG) (n = 48)		Schizophrenia Group (SG) (n = 47)		p-value
	Mean	S. D.	Mean	S. D.	
Age (year)	43.88	19.38	43.64	11.30	$P = 0.942^a$
Education (years)	12.98	2.43	12.38	2.52	$P = 0.243^a$
Duration of illness (years)			12.46	2.32	

^aIndependent Samples t-test was used to calculate the differences between the groups. Statistically significant: $p < 0.01$, Bonferroni correction.

TABLE 2 | Differences in task performance between CG and SG.

Experimental tasks	Control Group (CG) (n = 48)		Schizophrenia Group (SG) (n = 47)		p-value
	Mean	S. D.	Mean	S. D.	
Comprehension questions	8.42	1.76	6.55	2.34	0.050 ^a
Explicit mental state reasoning questions	9.08	3.75	4.98	3.96	<0.001 ^a
Spontaneous mental state inference question	0.27	0.54	0.09	0.28	<0.001 ^a

^aMann–Whitney U test was used to calculate the differences between the groups. Statistically significant: $p < 0.01$, Bonferroni correction.

TABLE 3 | The effects of age, education, gender on explicit ToM skills in the two groups.

Model	Control group (CG) (n = 48)		Schizophrenic group (SG) (n = 47)	
	ANOVA p-value	Adjusted R Square	ANOVA p-value	Adjusted R Square
Parameters	0.000	0.378	0.001	0.332
	Unstandardized B coefficients	p-value	Unstandardized B coefficients	p-value
Age (year)	-0.050	0.036	0.087	0.076
Education (years)	0.162	0.388	-0.005	0.981
Gender (0 = female)	0.474	0.595	1.074	0.343

Linear Regression.

($pc = 0.388$, $ps = 0.981$) and gender ($pc = 0.595$, $ps = 0.343$). Out of the participants so few responded to the spontaneous mental state inference questions in both groups (SG 4, CG 11) that it was not statistically relevant to analyze the influence of age, education, and gender on spontaneous mental state inferences.

We analyzed further only the between group differences in explicit mental state reasoning for the same reason. To compare our two groups' ToM skills independently of comprehension in terms of explicit ToM, we performed ANCOVA to provide the statistical significance value of whether there are statistically significant differences in explicit ToM between the two groups (SG and CG) when adjusted for comprehension. We found that there is a statistically significant difference between adjusted means ($p = 0.002$), and persons with schizophrenia achieved significantly lower scores than those of the control group (Table 4).

TABLE 4 | The number of people in each group and the differences in explicit ToM between the two groups (CG and SG) when adjusted for comprehension.

Explicit ToM	Diagnoses		p-value
	SG (n = 47)	CG (n = 48)	
Mean	4.98	9.08	0.002 ^a

^aANCOVA test was used to calculate the differences between the groups. Statistically significant: $p < 0.01$, Bonferroni correction.

Analyzing the ceiling effect in explicit ToM, scores in SG were relatively normally distributed with a slight positive skew (skew = 0.82, kurtosis = -0.11) indicating an asymmetry in the distribution where by the majority of scores were on the left side of the distribution (reflecting that the majority of individuals received scores of 7 out of 16 possible points or lower). Importantly, there was substantial variation in results across individuals with scores ranging from 0 to 15 (possible scores = 0–16), and no indication of a ceiling effect (2.1% of participants scoring 16/16 or 15/16) with a mean score 5.0 ± 1.2 .

While examining the CG in the same field we also found that the data was close to the normal distribution with negative kurtosis (skew = -0.03, kurtosis = -1.10), which is flatter than the normal curve (so similar persons reached points 5–12). There was substantial variation in results across individuals with scores ranging from 2 to 15 (possible scores = 0–16), and there was no indication of a ceiling effect (8.3% of participants scoring 16/16 or 15/16). Mean score was 9.1 ± 1.1 .

DISCUSSION

In the present study we report our results gathered from utilizing the Short Story Task, which was originally designed and tested in English with healthy participants (1). In the present research our aim was to test the applicability of SST in schizophrenia. As far as we know, this is the first study in which the ToM performance of persons with schizophrenia has been investigated while using this method.

According to our hypothesis, significant differences were detected in the explicit ToM scores between the persons with schizophrenia and the control group participants. Explicit mental state reasoning was found not to be influenced by age, education, and gender. The scores also indicated the lack of ceiling effect in both groups. In line with our expectations, there were also significantly more spontaneous ToM references among healthy subjects than among patients. Although our assumption has been substantiated, unfortunately the case numbers were quite low. Only a few participants (SG: 4/47, CG: 11/48) answered the spontaneous mental state inference question in both groups while using mental state terms. The patient group performed more poorly in the comprehension questions, although after Bonferroni correction—the difference between the groups did not reach the significance level.

Generally, our results confirm previous data that explicit ToM is markedly impaired in schizophrenia, however, we cannot dismiss the occurrence of a more general language processing disturbance (e.g. verbal comprehension, pragmatic deficit) in terms of weak ToM performance (7, 37). Although comprehension scores did not differ significantly after Bonferroni correction the performance of the patients was still poor compared to the healthy controls. These results may reflect a more general language processing deficit, however, they line up with the findings of the original study of Dodell-Feder et al. (1), namely that ToM scores were unrelated to understanding the nonmental aspects of the story. They concluded firstly, that their

structured interview questions successfully isolated ToM skills from the general reading abilities, and secondly that comprehension scores did not link with the other measures of social cognition used for concurrent validation of the SST. For further investigation, we compared our two groups' explicit mental state reasoning skills when adjusted for comprehension. Persons with schizophrenia still achieved significantly lower scores in explicit mental state reasoning questions than the control group participants. On the other hand, so few participants responded while using mental state terms in the spontaneous mental state inferences questions in both groups, that it was not statistically relevant to compare their performances accordingly.

The low number of spontaneous mental state inferences in both groups was an unexpected result, and this finding may reveal a potential limitation of SST. It suggests that SST may be more suitable for evaluating the explicit mental states, as only one question seems disproportionately scant for assessing spontaneous mental states compared to the 8 explicit mental state reasoning questions. This may also suggest that supplementing SST with an easily applicable test for measuring spontaneous ToM [e.g. Social Attribution Task, multiple-choice version, SAT-MC, (8, 10)] would create a more complex and detailed picture of ToM deficits in schizophrenia. It is in line with literature suggesting that multi-modal assessment should be used to explore the ToM deficits in schizophrenia (19). Overall it could be concluded, that the new short story method is easy to implement, requires no special conditions, takes about 25–30 min on average to read the story and answer the questions, and it is easy to score reliably. The detailed instructions, questions, and the anchoring points in the clearly defined point system simplify the evaluation process. Although SST is easy to administer, the full time demand (reading the short story, the interview, and scoring) is longer than in other ToM measures (e.g. the administration time of above-mentioned SAT-MC is approximately 10 min), which in turn may limit the everyday use in certain clinical circumstances.

An important result of our study was the confirmation of the lack of ceiling effect since according to our findings neither the patients, nor the healthy participants achieved 100%, unlike in the other frequently used ToM tests, so the distribution of the scores confirms the lack of ceiling effect. It is important to note on the other hand that patient scores also showed very high variability, confirming the test's sensitivity to individual differences in terms of ToM skills.

This substantial variation in performance may assist to generate a more subtle assessment of ToM skills. ToM is a key aspect of social cognition, which has strong relations to community functioning (38), hence, ToM is a proximal skill to functioning, and taking these individual differences into consideration may even help in customizing the rehabilitation plan in the future. Additionally, further development of this new evaluation method may open perspectives for further preventive screenings of the ToM deficit in high-risk groups. Reliable data suggests that ToM skills deteriorate in the early course of the disorder, as clinically high-risk subjects exhibit a blunted developmental trajectory in ToM skills from age 17 onward (16).

Future perspective of SST can be linked to a potential further development of SST Administration and Scoring Materials, which might be the most prominent strength of SST. It could easily be adapted to different short stories, which means that potentially several different SST batteries could be generated, which in turn may enable the repeated use of SST to monitor the changes in ToM abilities. It should also be mentioned on the other hand that the relevance of literary fiction in ToM research expands beyond testing. According to recent results, fiction and narrative processing is an emerging and promising approach in improving social cognition (39). Reading literary fiction leads to better performance in ToM tests in healthy subjects compared to reading non-fiction, popular fiction, scientific fiction or nothing at all (40, 41). Most recently a meta-analysis found a small positive impact of fiction reading on social cognition (42). This impact could be linked to a characteristic feature of literary fiction, as it requires the reader to be engaged in a simulated social experience by being immersed in the mental and social life of the fictional characters (1, 43). Literary fiction can also bolster the learning of mental state vocabulary (44), which seems to be compromised in schizophrenia (7). Although there is no research data on the effect of literary fiction on ToM among persons with schizophrenia, there is a substantial tradition in using literature in psychosocial interventions (poetry therapy, bibliotherapy) as a facilitating tool to enhance social skills (45). Since reading fiction could promote ToM abilities, it could be conceived as a low-cost tool to be potentially integrated into psychosocial interventions or utilized in rehabilitation programs (41) in schizophrenia, leading us to a possible conclusion that SST could be a useful and natural equipment in measuring ToM skills and in their follow up examinations.

Limitations

However, some limitations should be addressed. Such as the lack of full PANSS, as the different symptom domains of schizophrenia, especially negative symptoms, were reportedly have association with ToM (46–48). According to the remission criteria of schizophrenia (33) we measured three negative symptom items of PANSS: blunted affect, passive/apathetic social withdrawal and lack of spontaneity and flow of conversation. Results on negative symptoms and ToM suggest (46, 47) these symptoms may interfere with ToM tasks, especially with verbally mediated tasks having substantial verbal memory and expression demands. However, our patients exhibited only mild or no negative symptoms, which suggests that negative symptoms might not have influenced the performance in SST. The lack of the full PANSS however is still a limitation of the study, and future investigations should address this dimension. We did not use independent auditory verbal comprehension test to rule out the confounding effect of verbal comprehension. Although SST includes comprehension questions, the fact that persons with schizophrenia performed less accurate in terms of the comprehension questions compared to the control subjects highlights this limitation. Due to time restrictions we did not have the opportunity to test concurrent validity with other ToM measures in schizophrenia. In spite of the fact that the main

purpose of this study was to test the applicability of the new SST with persons with schizophrenia, the lack of use of another ToM test as a comparison is yet another important limitation that should be addressed in future studies. While general intelligence was not assessed, the educational levels were compared in the two samples in order to limit the potential effects of IQ. The question of medication of the patient group also poses another limitation. All patients were on maintenance antipsychotic treatment medications and—while data on the effects of antipsychotics on ToM are limited—according to our current knowledge antipsychotics do not significantly influence patients' mental state reasoning abilities (18, 49).

Conclusion

As a conclusion we found that our results lined up with the original Dodell-Feder et al. (1) findings and we found that reading fiction could be used as an assessment tool for explicit ToM skills in persons with schizophrenia. The patients performed more poorly in SST compared to healthy controls. The SST lacks the ceiling effect, and it is sensitive to explore the individual differences in ToM performance, and so it can be useful in planning psychosocial interventions. An important limitation of SST is the low sensitivity to measure spontaneous ToM and the relatively long administration time.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

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ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Committee on Medical Ethics, University of Pécs. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JF: study design, data collection, interview scoring, data analysis, manuscript writing. ZP: statistical analysis, manuscript writing. EV: interview scoring, data analysis. TC: data analysis, manuscript writing. OZ: pilot study, data analysis. TT: study design, psychopathology assessment, manuscript revision. RH: study design, psychopathology assessment, manuscript writing and revision.

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Az irodalmi művek olvasásának jelentősége, mentalizációra gyakorolt hatása és potenciális terápiás lehetőségei

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Bevezetés

Ahhoz, hogy a társadalomban sikeresen létezni tudjunk, leginkább az a képesség szükséges, hogy fel tudjuk ismerni, fel tudjuk mérni a többi ember mentális állapotát, majd annak megfelelően legyünk képesek alakítani saját reakcióinkat. Ezt nevezzük mentalizációs képességnek, vagy tudatelméletnek („theory of mind”), ami nem más, mint egy másik ember meggyőződésének, érzelmének, szándékának pontos megértése, ami lehetővé teszi a jövőbeli mentális állapot előrejelzésén keresztül a megfelelő társas viselkedés megvalósítását (1). A mentalizáció képességének tökéletesítése, fejlesztése egy hosszú folyamat, ami végigkíséri egész életünket és befolyással lehet empátiás képességünkre, illetve kihathat a proszociális viselkedésünkre, valamint a társas csoportban való helyünkre. A szocializáción keresztül megvalósuló gyakorlás és személyközi kapcsolatok elősegítik ennek a képességnek a fejlődését. Ehhez hasonló módon javíthatja a mentalizációt az is, ha elképzeljük az interperszonális interakciókat, amihez az irodalmi művek hatása szolgálhat mintául. A másik ember gondolataival való törődés, elfoglaltság javíthatja az interszubjektív kapcsolatiságot támogató pszichológiai folyamatokat, még akkor is, ha ebben a viszonyban a másik ember egy kitalált, nem létező személy. Az olyan társas környezet képes leginkább a mentalizációs képesség fejlődését elősegíteni, ahol nagyobb lehetőség van személyközi interakciókra és nem kell mereven ragaszkodni a szociális identitáshoz és szerepekhez (2). Mások mentális állapotának megértése egy olyan alap-

vető képesség, amely az összetettebb társas kapcsolatokat jellemzi, ugyanakkor kevés kutatás vizsgálta azt, hogy pontosan mi segíti, és mi fejleszti ezt a képességet (3).

Irodalmi művek olvasása és annak hatásai

Könyvolvasás, filmnézés, színdarabok és az operaelőadások megtekintése mind ún. fikciós narratíváknak nevezett tevékenységek, amelyeknek az egyik funkciója, hogy elvonják az emberek figyelmét a napi rutintól, hogy ki tudjanak szakadni a mindennapokból (4). A különböző irodalmi művek olvasása bővítheti ismereteinket mások életével kapcsolatban, oly módon, hogy segít felismerni a köztük és köztünk lévő hasonlóságokat, megváltoztathatja, hogy az emberek hogyan vélekednek másokról, és arra készíti őket, hogy aktívan vegyenek részt az elmeolvasás és a karakterépítés folyamatában. A fikciós irodalmi műveket *Bahtyin* polifonikusként határozza meg és azt javasolja, hogy az olvasó aktívan járuljon hozzá saját hangjával ehhez a kakofóniához (3, 5). A művészi alkotásokra jellemző kizárólagos és markáns szerzői perspektíva hiánya arra készíti az olvasót, hogy lépjen párbeszédbe a szerzővel és a szereplőkkel. *Mar és mtsai* szerint az irodalmi fikció olvasása a fantáziát is fejleszti (6). *Bruner* szerint az irodalom és az irodalmi művek az olvasóval beszélgetést kezdeményeznek, mivel arra készítetik az olvasót, hogy fejükben töltsék ki az esetleges hiányokat és keressenek más lehetséges jelentéseket, magyarázatokat (7). *Barthes* különbsé-

get tesz olvasható és írható szöveg között, amelyben az előbbi célja a szórakoztatás, utóbbié pedig a kreatív részvétel (8). Ezekre az említett elméletekre alapozta *Kidd és Castano* azt az értekezését, miszerint az irodalmi fikció írható és polifónikus szöveg, amely olyan pszichológiai folyamatokat indít el, ami hozzáférést és betekintést enged a szereplők perspektívájába (2). Az irodalmi fikció világa – a valódi élethez hasonlóan – tele van bonyolult és összetett személyekkel, szereplőkkel, akiknek belső világát sokszor nem egyszerű megismerni és feltérképezni (9). Ez a világ ugyanakkor kevesebb kockázatot is jelent az olvasóra nézve, mint a valóságos kinti világ, hiszen fenyegető következmények nélkül kínál lehetőséget mások tapasztalatainak megélésére. Az irodalmi fikció gyakran igényli elvárásaink elengedését, és így az olvasó kénytelen konvenciók és sztereotípiák nélkül a mentalizációs képességeit használni, hogy megértse mi történik (3).

Mar és Oatley tanulmányukban azt hangsúlyozzák, hogy az irodalmi művek különféle társas világokat szimulálnak, és műfajtól függően eltérő igényeket támasztanak a mentalizációs folyamatokra vonatkozólag (10). Az irodalmi művek rendszeres olvasása ugyanakkor hatással van a rutinszerű gondolkodásmódra azáltal, hogy lehetővé teszi az olvasók számára, hogy azonosuljanak a történet szereplőivel, anélkül, hogy szembesülnének a valóságos részvétel esetleges negatív következményeivel. Mivel irodalmi szereplők állnak leggyakrabban az irodalmi művek középpontjában, ez arra ösztönzi az olvasókat, hogy figyeljék és nyomon kövessék olvasás közben a szereplők mentális állapotát (szemben a nem fikciós irodalmi művekkel, ahol lélektani blokk léphet fel az olvasóban, mivel tisztában vannak vele, hogy az események a valóságban is bekövetkeztek) (11). Több kutatás is pozitív korrelációt mutatott ki az irodalmi művek ismerete és olvasása, valamint a mentalizációs képességek között, ami arra enged következtetni, hogy az olvasással töltött idő erősítheti azt a képességünket, hogy sikeresen megértsük a világot magunk körül (2). Ezen kutatások szerint azok, akik sok irodalmi fikciót olvasnak, empátikusabbá válnak, mivel a fikció

a társas tapasztalatok egyfajta szimulációjaként szolgál, amelyben az emberek gyakorolják és továbbfejlesztik interperszonális képességeiket (4). *Kidd és Castano* kutatásának különlegessége abban áll, hogy bizonyítékot szolgáltat arra, hogy bár szinte az összes irodalom olvasása alapot nyújthat az említett szimulált társas élményekhez, kifejezetten a fikciós irodalommal való kapcsolat tudja pozitív módon befolyásolni a mentalizációs teljesítményt (a fikciós irodalom előzetes ismerete már előre jelezte a jobb teljesítményt a Szemekből olvasás teszt esetében) (2). A fikciós irodalom mentalizációra kifejtett pozitív hatását később *Black és Barnes* megismételte úgy is, hogy az eredményeket kontrollálták az előzetes irodalmi tapasztalatokra (12).

A fikciós irodalom tehát lehetővé teszi az olvasók számára, hogy saját ritmusban tudják visszatükrözni a szereplők viselkedését és mentális állapotát a valós társas viselkedéshez kapcsolódó kockázatoktól való félelem nélkül. Az is felvetődött érdekes kérdésként, hogy az irodalmi fikció erősebb érzelmi reakciókat vált-e ki, mint a nem fikciós történetek olvasása. *Bruner* azzal is érvelt, hogy sokszor nehéz szétválasztani a fikciót a nem fikciós szövegtől, éppen ezért szétválasztotta a logikai-tudományos gondolkodásmódot (amelynek célja az egyetemes igazságok keresése az érvelés és a logika segítségével) a narratív gondolkodásmódtól (melynek középpontjában az olvasó által értékelt hitelesség áll) (7). Amikor elolvasunk egy történetet, meg tudjuk jósolni a szereplők cselekedeteit és reakcióit azáltal, hogy következtetéseket vonunk le abból, amit éreznek, gondolnak, szándékoznak csinálni. Ebben a folyamatban a történet értelmet nyer, és lehetőséget kínál mások megértésére úgy, hogy figyelembe vesszük a szereplők nézőpontját (empatizálunk velük) (4). *Appel* szerint a narratívába való bevonódás az egyénben bekövetkező változások fő előfutára, így közvetlen változás is inkább akkor fordul elő, ha a történetbe érzelmileg is bevonódik az olvasó (13). Fontos még megemlíteni az ún. abszolút alvóhatás jelenségét, ami az irodalmi fikció egyik hatásaként említendő (ennek megfelelően az irodalmi művek olvasásának hatása nem azonnal jelentkezik, hanem az idő múlásával), hiszen

az átalakulás/változás folyamatához időre van szükség (4). Az érzelmi bevonódásnak másik pozitív hatása, hogy az olvasó jobban is emlékszik a történet eseményeire, ehhez ugyanakkor szintén egy inkubációs periódusra van szükség (6). *Bal és Veltkamp* kutatásában 3 alkalommal vizsgálták az empátiás képességet az olvasó érzelmi bevonódásán keresztül: olvasás előtt, olvasás után, majd 1 hét elteltével újra (4). Eredményeik szerint az empátiás készség rosszabbodott, amikor nem történt érzelmi bevonódás az olvasó részéről. Eredményük azt is mutathatja, hogy a fikciós irodalmi művek olvasásának lehetnek negatív hatásai is, ha az olvasó nem tud érzelmileg bevonódni, ez hosszútávon eredményezhet negatív attitűdöt és elfordulást is az irodalomtól.

Az elmúlt évtized során számos kísérlet történt az egészséges és pszichiátriai populációk esetében az emberekkel való együttérzés, a mentalizálás képességének javítására. *Kidd és Castano* egy nagyon érdekes kutatási területet fedezett fel a társas kogníció területén, amely az irodalmi szövegek olvasásához kapcsolódott (2, 3). Kevés tanulmány foglalkozik az irodalmi szövegek olvasása közben bekövetkező érzelmi és társas összetevőkkel, és csak néhány tanulmány vizsgálta kifejezetten a történet-feldolgozás alapjául szolgáló érzelmi folyamatokat.

Pino és Mazza – Kidd és Castano (3), illetve *Black és Barnes* (12) kutatásai alapján – megkísérelte megismételni és kibővíteni a korábbi tanulmányokat mentalizációs és empátiás tesztek sokféleségének felhasználásával (11). Arra kérték a résztvevőket, hogy egy teljes könyvet olvassanak el (fikciós irodalom, tudományos irodalom vagy science fiction), és az olvasás előtt és után is töltsenek ki több szociális kogníciót vizsgáló tesztet. Egyedül a fikciós irodalom olvasása után észlelték a mentalizációs készségek javulását, de az empatikus érzelmi rezonancia változását nem tudták kimutatni.

Mentalizáció mérése novellákkal

A fikciós irodalom mentalizációra kifejtett kedvező hatásaival kapcsolatos eredmények szol-

gáltatták az ötletet egy új mentalizációs teszt – a „Novella Feladat” – kidolgozásához (Short Story Task) (1). *Dodell-Feder és mtsai* azt feltételezték, hogy az általuk kidolgozott teszt sok tekintetben kiküszöbölheti a gyakran használt mentalizációs tesztek korlátait (1).

A mentalizációs képesség kutatásában jelenleg jóval kisebb arányban található egészséges felnőtt személyek körében elvégzett vizsgálat, noha a 80-es évek óta egyre nő a felnőttek körében végzett vizsgálatok száma, melyek közül több tanulmány is azonosított egészséges felnőtt személyek között megragadható egyéni különbségeket a mentalizáció képességében (14, 15). Az elmúlt évtizedekben számos tesztet fejlesztettek ki a mentalizáció mérésére (1, 16, 17). Ezeknek a teszteknek a többségét elsősorban gyermekek számára fejlesztették ki, ezért lehetséges, hogy ezek a feladatok nem megfelelőek a felnőttek számára. Ezt a problémát több esetben úgy próbálták áthidalni a kutatók, hogy fokozatosan nehezítették a feladatokat, például másodrendű mentális állapotra való következtetési kérdéseket tettek a feladatok közé. Ez a megoldás ugyanakkor egy más szintű, nem a társas kognícióhoz köthető nehézséget eredményezett, ugyanis a módosított feladatok erőteljesebb végrehajtó funkciót, munkamemóriát, és verbális képességet igényeltek, ez pedig megnehezítette a különbségtételt a mentalizációs képesség és a neurokognitív képességek között (1). Ráadásul ezek a tesztek gyakran nem elég érzékenyek, csak a súlyos sérüléseket tudják kimutatni, az apró egyéni különbségek – akár egészséges egyének között is – rejtve maradhatnak. Ezen módszerek további hátránya, hogy az egészséges személyek gyakran 100%-on vagy közel 100%-on teljesítenek, így kimutatható a plafoneffektus. A plafoneffektus kérdése különösen hangsúlyos a különböző pszichiátriai betegségek mentalizációs vizsgálatakor. Így például a szkizofréniával élő betegek mentalizációjának kutatásában is gyakori jelenség, hogy az egészséges kontrollok általában 90% fölött teljesítenek (1). Ennek eredményeként a mentalizációs deficitek leírása sokszor nem mutat kellően differenciált képet. Például az elsőfokú rokonok vagy a magas kockázattal bíró személyek

a szkizofréniára jellemző mentalizációs teljesítményhez viszonyítva általában enyhébb formában mutatnak rendellenességeket (18–20), de még a szkizofréniában szenvedő betegek is eltérő mértékben mutatnak deficitet (1). Pedig a szkizofréniá-spektrum betegségek premorbid vagy korai időszakában a legapróbb deficit korai észlelése is jelentősen elő tudná segíteni a diagnosztikus és prevenciók aktivitást.

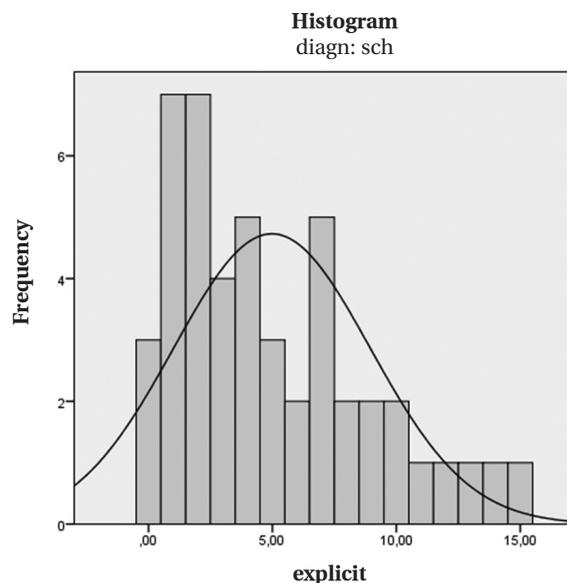
Dodell-Feder és mtsai a 2013-as tanulmányukban egy olyan új, fikciós irodalom értelmezésén alapuló mentalizációs feladat megtervezését célozták meg, amely a meglévő mentalizációs tesztekre vette alapul, és megpróbálta áthidalni a korábbiak okozta nehézségeket, limitációkat. Célként tűzték ki a plafoneffektus kiiktatását, az egyéni különbségek bemutatásának képességét, azt, hogy valós társas interakciókat használjanak különféle komplex mentális állapotok bemutatásával, illetve, hogy mind az spontán és explicit mentalizációs állapotra való következtetések, mind a történet nem mentalizációs aspektusainak megértését vizsgálhassák. Fontos szempont volt a kidolgozás folyamatában, hogy a teszt könnyű és gyorsan felvehető, illetve értékelhető legyen. Mindehhez egy novellát használtak. Az általuk választott *Hemingway* novella („Valami véget ér”) előnye, hogy nyelvezete könnyű és közvetlen, a mentális állapotok nincsenek explicit leírva, így az olvasót rákényszeríti, hogy mentális állapotokra vonatkozó következtetéseket vonjon le. A nyelvezet használ szarkazmust, iróniát, tele van a szöveg szimbólumokkal, és az olvasónak figyelnie kell a nem-verbális és közvetett kommunikációra is, ugyanakkor magasabb rendű érzelmek (a büntudat, az érzelmek elrejtése) szerepelnek benne. Mindezek miatt az olvasó kénytelen mentális állapotra vonatkozó következtetéseket levonni, hogy megértse a szereplők mentális állapotait és a köztük lévő interakciókat. A novella olvasása előtt a résztvevők kifejezett utasításokat kapnak, majd az olvasás után 14 nyitott kérdésre válaszolnak egy strukturált interjú formájában. A feltett kérdések közül 5 kérdés a szöveg megértésére, 8 az explicit mentális állapottal kapcsolatos érvelésre, 1 kérdés pedig a spontán mentalizációs teljesítményre vonatkozik. Az interjú a spontán

mentalizáció vizsgálatával kezdődik, melynek során a kérdés nem hívja fel kifejezetten a résztvevők figyelmét arra, hogy nyilatkozzanak a szereplők mentális állapotára vonatkozóan. A szereplők mentális állapotának spontán említése elméletileg azt tükrözi, hogy a résztvevő hajlamos-e mentális állapotokban gondolkodni, figyel azokra, mivel fontosak számára. A NF egy részletesen kidolgozott értékelési sémát is tartalmaz. Az új módszer megegyező validitást mutatott két mentalizációs teszttel, az Interperszonális Reaktivitási Index-szel és a Szemekből Olvasás teszttel összehasonlítva (1). A kutatás fontos eredménye volt, hogy a mentális állapot érvelési pontszámai (explicit mentalizáció eredményei) és a szereplők mentális állapotára vonatkozó spontán következtetések (spontán mentalizáció eredményei) nem kapcsolódtak a történet tárgyi megértéséhez (1). Az új teszt előnye, hogy az irodalmi fikció tesztben való felhasználásán keresztül az olvasó lehetőséget kap a szereplők társas tapasztalatainak szimulálására, ami ezáltal egy biztonságos platformot biztosít a mások mentális állapotára vonatkozó érvelések felmérésére.

Az NF használhatóságát kutatócsoportunk szkizofréniával élő páciensek esetében tesztelte (21). Ennek során azt találtuk, hogy a szkizofréniával élő páciensek rosszabbul teljesítettek az explicit és spontán mentalizációs kérdésekben, és ez független volt a szövegértéstől. A plafoneffektus sem a páciensek (1. ábra), sem a kontrollcsoport (2. ábra) teljesítményét nem jellemezte. Meg kell azonban jegyezni, hogy a spontán mentalizációs válasz ritka volt mind a betegek, mind a kontrollszemélyek esetében, ami azt sugallja, hogy a spontán mentalizációs tevékenység vizsgálatára ez a teszt kevésbé alkalmas. Összeségében a NF jól használható a szkizofréniával élő páciensek explicit mentalizációjának teszteléséhez. A teszt könnyen implementálható a napi rutinba, 25–30 perc alatt felvehető, és nincs különösebb eszközigénye. Az értékelése relatíve egyszerű, az egyéni különbségek pedig érzékenyen detektálhatók. A NF egyik legértékesebb része a strukturált interjú és a pontozási rendszer, ugyanis a teszt a novellák változtatásával használható akár utánkövetéses

1. ábra

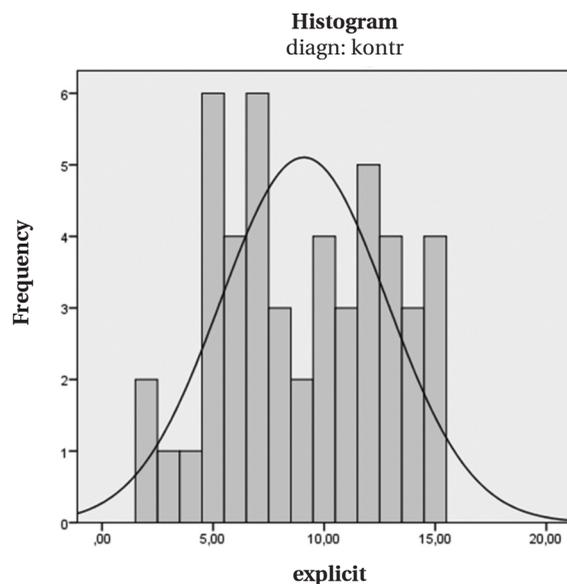
A szkizofrénia csoport eloszlása



Mean = 4,98
Std. Dev. = 3,964
N = 47

2. ábra

A kontrollcsoport eloszlása



Mean = 9,08
Std. Dev. = 3,752
N = 48

vizsgálatokban is a mentalizációs készségek változásának követésére.

A NF-t alkalmazhatóságát egy szkizofrénia szempontjából magas rizikójú csoportban végzett vizsgálatban is kimutatták (20). A magas

rizikójú egyének nem tértek el jelentősen a kontrollcsoporttól az explicit mentalizációs képességekben, de sokkal kevesebb spontán mentális állapotra vonatkozó értelmezést adtak, mint az egészségesek. Eredményeik azt sugallják, hogy az implicit mentalizáció deficitje megfigyelhető már a pszichotikus állapot megjelenése előtt is, amikor az explicit mentalizációs teljesítmény még nem érintett. Ez a vizsgálat csökkent hatékonyságú funkcionalitást írt le mindkét oldalon a mediális prefrontális lebeny területén, ami összefüggést mutatott a gyengébb spontán mentalizációval. Ez a vizsgálat is azt mutatja, hogy NF kellő szenzitivitással képes a mentalizációs teljesítmény mérésére klinikai populáció esetén is.

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Ernest Hemingway: Valami véget ér

Ahogy láttuk egy ismert irodalmi mű mentalizáció kutatásban való alkalmazása kapcsán került elő több vizsgálatban is *Ernest Hemingway* munkássága, különös tekintettel a „Valami véget ér” című novellájára (1, 20–22). *Hemingway* a 20. század egyik meghatározó kreatív alakja, színes, kalandokban gazdag, mondhatni szélsőségesen alakuló és kimenetelű életet élt. Munkássága mellett a hipermaszkulinitás már-már mitikus megtestesítője volt, alkoholfüggő szoknyavadász, hivalkodó vadász/horgász, bikaviadatok hőse, bokszoló, akinek ugyanakkor bipoláris, illetve borderline és nárcisztikus személyiségzavar jegyeit, azok diagnózisát életrajzírói és más írók, barátai is vélelmezték (23, 24). *Baker*, *Hemingway* egyik első életrajzírója használta először leírásában a „mániás depressziós” kifejezést és feljegyezte, hogy *Hemingway* visszatérően beszélt az öngyilkosságról (25). *Hemingway* kiszámíthatatlansága, alkoholproblémája, apja befejezett öngyilkossága, anyjával való különös viszonya mind hozzájárult párkapcsolatainak és munkásságának alakulásához. *Baker* szerint kapcsolatai instabilak voltak, tele konfliktussal és az egész életén átívelő pszichopatológiáját próbálhatta kezelni – mintegy adaptív énvédő mechanizmusként – a kreatív munkával (26). *Hemingway* élettörténete önmagában is érdekesnek mondható és számos autobiográfiai párhuzam vonható a novella története és az író élettörténete között. A „Valami véget ér” része az *In Our Time* című kötetnek, ami 1925-ben jelent meg, és melynek visszatérő szereplője Nick Adams, akit sokan *Hemingway* autobiográfiai alteregójának tekintenek. Egy szereplő, aki *Hemingway* műveiben visszatérően tapasztalja meg a felnőtté válás nehézségeivel teli folyamatát. Sok irodalomelemző írt arról, hogy milyen párhuzamok

vannak a novella szereplői, a történet és *Hemingway* élete között. *Hemingway* prózájára az egyszerűség és tömörség jellemző, írásaiban a valóságos jelentés gyakran párbeszédeken, cselekményen és a csöndeken keresztül jelenik meg, a fontos dolgokat nem mondja ki. Stílusát az ún. jéghegy elméletével jellemezte: ami nem más, mint a kihagyás művészete, melyben úgy tud az író elbeszélni, leírni valamit, hogy közben valami egészen más dolog kerül a felszínre. Stílusának egyszerűsége éppen ebből adódóan rendkívül megtévesztő, hiszen *Hemingway* szándékosan használ lecsupaszított nyelvezetet, multiformális, fotografikus realizmusa képkollázsokat alkot, amelyek között filmszerű vágásokkal vált.

A fikciós irodalom terápiában betölthető szerepe

A klinikai kutatásokban egyre nagyobb érdeklődés mutatkozik a mentalizáció iránt, különös tekintettel annak kapcsolatára a normál és a patológiás működéssel, illetve mint a pszichoterápiás változás mechanizmusának egyik potenciális hatótényezőjére. Több kutatás is célul tűzte ki a rehabilitációs protokollok javítását egyes pszichiátriai betegségek esetében. *Pino és Mazza* szerint az olvasás hatásainak árnyaltabb megértése szükséges az olyan rendellenességek potenciális rehabilitációs kezelésének érdekében, ahol az empátia és a mentalizáció áll a középpontban, mint például az autizmus spektrumzavar és a szkizofrénia esetében (11). *Vargas és mtsai* a már említett 2019-es tanulmányukban rávilágítottak, hogy a NF-tal mért mentalizációs képesség károsodik a szkizofrénia szempontjából klinikailag magas rizikójú csoportokban, és mindez szorosan kapcsolódik a betegség funkcionális kimeneteléhez, illetve a tünetek súlyosságához (20). A szerzők egyértelmű konklúziója, hogy az eredmények rámutatnak a potenciális terápiás célpontokra. A fikciós irodalom olvasása egy lehetséges rehabilitációs eszköz lehet. A korábbiakban leírtak alapján az olvasás egy olyan gyakorlási lehetőséget jelent, ahol a társas interakciók szorongásmentesen szimulálhatók. A rövid novellák ilyen értelemben egy optimális alternatívát jelentenek, hiszen a fikciós irodalom mentalizációs erőfeszítést igénylő feldolgozási jellemzőinek megtartása

mellett relatíve kis neurokognitív erőfeszítést (pl. munkamemória, verbális memória stb.) igényelnek. A rövid novellák olvasása csökkenti a kognitív zárás kényszerűségének érzését (a rend és a struktúra hiánya, illetve a bizonytalansággal járó kellemetlenség miatti zárás szükségessége) (27). Ugyanakkor arra is tréningezi az olvasókat (ahogy teszik ezt a különféle társas kogníciót javító intervenciók), hogy rugalmasak legyenek mások viselkedésének kiértékelésében, illetve, hogy ne vonjanak le túl hamar következtetéseket (1). *Kidd és Castano* emblemikus vizsgálata óta ma már metaanalízis is rendelkezésre áll, mely 14 vizsgálat alapján azt találta, hogy a fikciós irodalomnak relatíve kicsi, de szignifikáns hatása van a szociális kognícióra (12, 28). A szerzők szerint ez a hatás feltehetően ahhoz köthető, hogy az olvasók belemerülnek a fikciós irodalom teremtette világba és óhatatlanul bevonódnak a fiktív karakterek mentális és társas életébe, ami viszont magával hozza a mentalizációs rendszer aktivizálódását. Ezen a szimulációs mechanizmuson túl azonban más hozadéka is lehet a fikciós irodalom olvasásának. Az irodalmi szövegek fejleszthetik a mentalizációs szótárat. Szkizofréniában meggyőző adatok bizonyítják, hogy a páciensek kevésbé használnak úgynevezett mentalizációs szófordulatokat, melyek a mentalizációs tevékenységre utalnak (pl. azt gondolta, szerintem, véleményem szerint, azt érezte, szomorúan, dühösen stb.) (29). A már említett *Hemingway* novella, a „Valami véget ér”, számos ilyen nyelvi mentalizációs utalást tartalmaz, anélkül, hogy direkt módon leírná, hogy ki mit és miért tesz a történetben. A fikciós irodalom mentalizációt javító hatását egyelőre egészséges személyek vizsgálata alapján írták le (28), de *Pino és Mazza* felvetik ennek rehabilitációs potenciálját a mentális betegségek esetében (11). A jól megválasztott fikciós irodalom beillesztése a rehabilitációs protokollba egy egyszerű és költséghatékony eszközt jelenthet a mentalizációs készségek fejlesztéséhez (11). A pszichoszociális intervenciók esetében ez azonban nem is olyan új ötlet, gondoljunk csak a korábban sokkal elterjedtebben használt költészet- vagy biblioterápiára (30). Mindebben a NF akár egy természetes és

könnyen használható eszköz lehet a változás nyomon követésében.

A mentalizáció, irodalom és nyelvi feldolgozás, illetve mindezek pszichoterápiás aspektusainak vizsgálatában egy új lehetőséget jelenthet az úgynevezett „konverzációs analízis”. A konverzációs analízis egy kvalitatív módszer, amely a társas interakciók szerkezetének és folyamatának megvizsgálására szolgál, és ami beszélgetésekben a mentalizáció kibontakozását egyedülálló módon ragadhatja meg (31). *Shaw és mtsai* egy 2019-es tanulmányban annak fontosságát hangsúlyozták, hogy a mentalizációt egy kapcsolati relációban kellene vizsgálni, és nem mint egyéni képességet, hiszen az kontextusban, másokhoz való viszonyulásból épül fel (31). Ez az új megközelítés a konverzációs analízis alternatívája mellett érvel. Egy ember mentalizációs képessége a kapcsolatok és a kötődési tényezők függvényében változhat, ez pedig egy kapcsolaton belül függhet az interakció természetétől és minőségétől. Ez a megközelítés felhasználható annak meghatározására, hogy a terapeuták miként erősíthetik a páciens mentalizációs képességét egy terápiás ülésen a terápiás beavatkozások irányításával, valamint a kezelés integritásának és a terápiás folyamat jellegzetességeinek felmérésével (31).

Konklúzió

Több vizsgálat eredménye is alátámasztja azt az állítást, miszerint az irodalmi fikció olvasása javíthatja az olvasók empátiáját és mentalizációs képességeit. A különféle területekről származó kutatási eredmények egyöntetűen azt sugallták, hogy az irodalmi művek (azon belül is a fikciós irodalom) olvasása javítja az interszubjektív kapcsolatiság képességét (28, 32). *Kidd és Castano* szerint az irodalmi fikció olvasása sokkal valószínűbb módon segíti elő a mentalizációs készségek fejlesztését, mint a nem irodalmi fikciós művek, illetve a nem fikciós művek (2, 3, 33). A szerzők azt vizsgálták, hogy a másikkal fenntartott kapcsolat – még akkor is, ha kitalált – javíthatja az interszubjektivitást támogató pszichológiai folyamatokat. A legtöbb ember azért olvas irodalmat, hogy tanuljon, szórakozzon, vagy, hogy megtapasztalja a szépséget, illetve, hogy utat találjon másokhoz. Ezek a célok azonban „erkölcsi célokat is szolgálhatnak”. Az irodalmi fikció olvasása segít további sémák kidolgozásában, a világ miénktől eltérő, más látásmódjának kialakításában. Az irodalom, amellet, hogy elvarázsol vagy megvigasztal bennünket, mentálisan fejlesztő hatású, és megújítja a világgal való kapcsolatunkat, így alkalmas arra is, hogy felfedezzük általa, hogy mit is jelent etikus embernek lenni egy-egy adott társadalmi-történelmi helyzetben.

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