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Metacognitive and Interpersonal Interventions for Persons with Severe Mental Illness: Theory and Practice

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Abstract: Communication and interpersonal deficits are major stumbling blocks that stand between persons with severe mental illness (SMI) and such recovery goals as quality of life (QoL) and community integration. Not only do these deficts have a direct and negative impact on the QoL and community integration of persons with SMI but they also may reduce these persons' ability to take advantage of major interventions in which communication and interpersonal relationships play a central role (i.e., psychotherapy, recovery programs, illness management and recovery). Recent theories of schizophrenia and other SMI attribute these communication and interpersonal limitations of persons with SMI to impairments of metacognition (i.e., empathy, theory of mind [ToM], mind reading). Within a dialogical framework of metacognition that differentiates between empathy and ToM, this paper reviews two interventions for persons with SMI, Metacognitive Training (MCT) and Social Cognition and Integration Training (SCIT), that were recently developed to improve communication and interpersonal skills of persons with schizophrenia. These interventions are based on the above described theories of schizophrenia and SMI. Although preliminary research has produced favorable results for these interventions, additional investigations using more critical research designs are required to establish their efficacy. Furthermore, this paper suggests that adding dialogical elements to these interventions might improve their effectiveness.

Over the past two decades, recovery has emerged as a set of principals guiding the professional activities of persons involved in providing mental health care and psychiatric rehabilitation to individuals with a severe mental illness (SMI). One of the central principals of recovery is a commitment to helping persons with SMI live their lives to the fullest extent possible. Because the quality of an individual's interpersonal relationships is an essential ingredient of an individual's quality of life (1), facilitating that person's full participation in his or her community is central to the above commitment (2). Communication and interpersonal deficits that are strongly related to schizophrenia and other SMI are major stumbling blocks that stand between these persons and this goal.

Communication and interpersonal relationships have a profound influence on our lives. Different facets of communication and interpersonal relationships are also essential to the main process that occurs in psychotherapy (3) and psychiatric rehabilitation interventions (i.e., recovery programs [4], illness management and recovery [5]). A central component of these interventions is the dialogue that takes place between the therapist or group leader and the clients. These interventions involve the establishment of a trusting relationship as the basis for critically and sensitively communicating about communication. As such they require the metacognitive and empathic ability to reflect and talk about one's social life. Thus, communication and interpersonal deficits caused by social, affective, and cognitive impairments, as seen in persons with SMI (6), might undermine one's ability to participate in such verbal interventions.

This paper will review and discuss two interventions for persons with SMI that have recently been developed to improve and integrate the various facets of metacognitive functioning. These interventions aim at enhancing the quality of

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communication and interpersonal relations and to impact positively both indirectly and directly on these persons' quality of life and community integration. The purpose of this paper is to examine these pioneering and pragmatic efforts within the context of two theoretical issues central to recent discussions of the metacognitive processes that are impaired in schizophrenia and other SMI. One of these issues concerns differentiating between metacognitive processes that develop early, are immediate and affective, and those that mature later, are mediated and cognitive (7, 8). A second issue concerns the role that communication, especially dialogue, plays in the development and maintenance of metacognitive processes. As part of the description of the two above mentioned metacognitive and interpersonal interventions, an argument will be made that these interventions are especially appropriate vehicles for using dialogue for integrating the emotional and cognitive facets of metacognition.

The impairment of interpersonal functioning in schizophrenia is so extensive that it is considered to be the core impairment underlying schizophrenia as a SMI (9–11). This interpersonal impairment produces disabilities that consist of difficulties in understanding and dealing with the social environment and the individual's place within it (9, 10). A number of current theories of schizophrenia attribute communication and interpersonal limitations of persons with schizophrenia to impairments of either metacognition and theory of mind (ToM) (12, 13), and/or empathy (14, 15). Metacognition refers to an individual's capacity for and interest in experiencing and reflecting on her or his self and the other as distinct persons. Such terms as metacognition, theory of mind, and empathy appear in discussions of this capacity and interest. Differences between these terms are not always clear and they are often used interchangeably.

In the present paper, the above terms will be used differentially to make tentative, but important, distinctions between various metacognitive phenomena and to assess the extent to which the interventions under review make use of these distinctions. One major distinction is between the relatively direct sharing of another's affective state and the inferring of another's beliefs, intentions and desires. A number of theoreticians in the area of metacognition suggest that the term "empathy" be reserved for the former metacognitive phenomena and theory of mind (ToM) be used when discussing the latter phenomena (7, 8).

Theoreticians and researchers have even suggested specific areas of the central nervous system that may differentially underlie the impairments in empathy (15) and ToM (12). Accordingly, Singer suggests that empathy and ToM may refer to different capacities with different underlying neuronal circuitry and ontogenetic trajectories (7). When making this distinction, Singer associates the capacity to develop a ToM with the ability to make attributions about another person's propositional attitude (desires, beliefs, intentions) whereas she associates empathy with the sharing of sensations and emotions of others. According to research cited by Langdon (16), the interpersonal disabilities of persons with schizophrenia may be more related to impairments of empathy than to impairments of ToM.

Because they do not take these putative impairments of empathy and ToM into consideration, interventions often applied by rehabilitation professionals and systems to ameliorate the many social challenges posed by schizophrenia are not designed to deal with these aspects of interpersonal disabilities. Thus, social skills training focuses on repairing the interpersonal deficits that often reduce the functioning and quality of life of persons with schizophrenia by improving specific social behaviors (17), whereas cognitive retraining and cognitive behavior therapy are used to deal with the cognitive and affective disorganization that blocks these persons' access to the resources necessary for normal functioning and quality of life (5). Approaches to psychiatric rehabilitation that treat the aspects of empathy and ToM associated with the social, affective and cognitive impairments and disabilities associated with SMI will be reviewed here.

The review will be carried out within the context of a dialogical conceptualization of metacognition. A basic assumption of this conceptualization is that the dialogical relationship entails empathic communication and, to a great extent, engenders and, at the same time, is enriched by our capacity

for empathy and ToM. In their attribution of our capacity to understand the life narratives of others to our ability to simulate physically the actions of others, Dimaggio et al. (18) paraphrase the argument that recent developments in neuroscience support the metaphor of the other as being part of the developing brain (19). Similarly, Tummolini et al. (20) identify an early innate capacity to be open to sharing experience as a necessary ingredient of both the development of communication and ToM processes.

Viewing dialogue as ideal intentional communication is consistent with the designation of the communicative act as an overt attempt to create a situation in which the participants in the dialogue experience a satisfactory relationship (21). In this sense, successful dialogue, in part, consists of coupling the cognitive dynamics of these participants. Thus, persons engaged in dialogue can be considered to be striving to sustain a bidirectional relation between intentional communication and empathy. However, due to impaired empathy and metacognition, the dialogue of persons with schizophrenia may disintegrate (22). This papers' description of existing interventions with persons with SMI that focus on these persons' impaired empathy and ToM will relate to the extent to which these interventions include elements of dialogue as components of these interventions.

Techniques used in cognitive-behavioral therapy play an important role in various psychiatric rehabilitation interventions. A metacognitive technique can be distinguished from a cognitive technique in that the latter deals with the content of desires, beliefs and intentions whereas the former examines the appraisals and management of these desires, beliefs and intentions (23). Possibly, because of the fuzziness of the boundary between cognitive and metacognitive techniques, cognitive therapy has explicitly begun to incorporate the consideration of metacognitive processes both with regard to the analysis and assessment of the problems of persons with schizophrenia and with regard to designing interventions for these persons.

Beck and colleagues (24) developed a measure of cognitive insight into severe mental illness that includes such metacognitive subscales as self-reflectiveness and confidence in the interpretation of experiences. This scale was constructed to increase the understanding of people's perspectives about their anomalous experiences. Furthermore, a metacognitive approach to psychotherapy has taken its place alongside the more traditional cognitive behavior approaches to psychotherapy (25).

A number of interventions that are considered to be evidence based practices in the field of psychiatric rehabilitation include training in communication and interpersonal relations. For example, life skills training (14) includes training in social contexts that place demands on metacognitive and communication processes. The illness management and recovery program includes modules that integrate the presentation and discussion of social support with cognitive techniques (5). However, these interventions do not focus directly on improving the capacity for empathy and ToM.

Very recently, metacognitive training programs have been developed to help persons with schizophrenia become aware of and to gain control over the metacognitive sources of their cognitive biases and deviant behavior. Assumptions underlying these programs are that impairments of metacognitive, theory of mind and empathic mechanisms and processes are responsible for certain of the major cognitive distortions and personal and interpersonal deficiencies and excesses experienced by persons with SMI. Moritz and Woodward (26) describe a metacognitive training program (MCT) that they developed and whose feasibility, treatment adherence and subjective efficacy they evaluated.

The above MCT program (27, 28) includes eight modules that address a variety of cognitive errors and problem solving biases that are associated with schizophrenia and such other SMI as bipolar disorder and severe personality disorder (26). Each module is reproduced with parallel exercises so that the participants in the training program can repeat the training twice. These modules deal with the following metacognitive biases: increased self-serving bias (module 1), a jumping to conclusion bias (modules 2 and 7), a bias against disconfirmatory evidence (module 3), deficits in theory of mind (modules 4 and 6), over confidence in memory (module 5), and depressive cognitive patterns (module 8). Modules are presented in a group format, consisting of three to ten persons.

Homework assignments are also used in conjunction with the modules. The MCT training program can be downloaded, as pdf files, cost-free via the web-site (*www.uke.de/mkt*) and is available in five languages.

In the MCT program described here, metacognition refers to both thinking about one's own thoughts and experiences as well as thinking about the thoughts and experiences of others. The MCT program does not emphasize the differences between ToM and empathy. Both are treated as a subcategory of metacognition that deals with thinking about the thinking and experiences of others. Module 6 is concerned with how we evaluate what others are thinking and experiencing. In this module's initial tasks, a list of social cues (i.e., posture, hands, language, clothes) that are often used to identify the emotional states, beliefs and intentions of others are presented followed by a list of the advantages and disadvantages of these social cues. These lists are accompanied by such questions for discussion as *when you get to know someone, where do you look first?* And *how reliable are these cues?* Subsequent tasks require the participants in the program to complete, rearrange and interpret cartoons that illustrate how the misuse of social cues can lead to interpersonal misunderstanding. The final tasks link the former tasks to problems with interpersonal relationships often experienced by persons with SMI.

Moritz and Woodward (26) compared the MCT program to CogPack (29), a computerized cognitive remediation program for persons with schizophrenia that is administered individually. The programs did not differ with regard to attendance, feasibility and acceptance, although a number of questions about subjective efficacy indicated that the MCT program was characterized by a statistically significant higher level of subjective efficacy than CogPack. In addition, a recent review by Moritz and Woodward (30) suggests that there is preliminary evidence for the feasibility and efficacy of the MCT program. In their review they summarized a preliminary study with outpatient samples that did not include an assessment of psychopathology, and a randomized control trial with blind assessment, that included psychiatric symptoms as criteria, and found that positive symptom decline was faster under MCT than under an active control.

As mentioned above, the developers of the MCT program do not relate to the differences between the empathic and ToM aspects of the metacognitive impairment of persons with schizophrenia that are central to the above described neuropsychiatric models of this impairment. Thus, they use the term empathy to refer to a person's ability to comprehend the beliefs, intentions and desires of another. whereas, as mentioned above, according to more recent models of metacognition, this term is explicated specifically as the ability to share another's experience (7, 8). Thus, in module 4A, labeled *To Empathize I,* such ways of exploring the thoughts and experiences of another person are presented, as referring to knowledge about that person or about that person's environment/situation. Nevertheless, the MCT manual encourages lively discussions among participants and instructs the group leaders to provide enough time for the participants openly to exchange their views, activities that may enhance the affective components of metacognitive communication. However, structured exercises designed to facilitate communicating with other persons and asking about their thoughts and experiences are not included in the list of examples of ways of improving empathy. In terms of this paper's emphasis on dialogue as empathic communication, such a process should be a major way of improving empathy with another person. Due to its sensitive and complex nature, this process could require one or more separate modules.

Another example of a metacognitive intervention is the Social Cognition and Integration Training (SCIT) program which was developed to improve both the social cognition and social functioning of person with schizophrenia spectrum disorders (31, 32). Although the name of this intervention refers to cognition rather than metacognition, actually it is designed to help persons with schizophrenia with such metacognitive issues as jumping to conclusions and theory of mind that are also the concern of the MCT program. However, SCIT emphasizes the interpersonal nature of the latter issues. Thus, the SCIT program deals with aspects of social abilities that are related to empathy when empathy is defined specifically as the capacity to share the sensations and emotions of others (7, 16). For example, the SCIT includes emotion training which

teaches emotion identification, emotion mimicry and understanding paranoia (31, 32). Thus, one of the rationales for the SCIT program's focus on social cognition is Brother's (33) claim that social cognition is concerned with mental operations underlying social interactions such as the human ability and capacity to perceive the intentions and dispositions of others. Accordingly, this intervention would appear to be more in keeping with this paper's emphasis on the centrality of dialogue and the interpersonal aspects of metacognition.

SCIT is divided into three phases – emotion training, figuring out situations and integration – that span 24 weeks of 50 minute sessions. Training in each of these sessions is provided by one to two therapists who make use of a manual and a DVD and a VHS supplement. Goals and procedures vary across the program's phases.

The goals of the emotion training phase are to provide information about emotions in general and about the basic emotions in particular. Commercially available computer-based programs are used to improve the participants' emotion perception and to facilitate their differentiation between justified and unjustified suspiciousness. During the figuring out phase, a variety of materials and activities are used to inform the participants about the dangers associated with jumping to conclusions, to increase their cognitive flexibility in social situations, and to help them distinguish between personal and situational attributions, and between social facts and guesses.

In the final integration phase, under the guidance of the therapists, the participants put into practice what they learned in the first two phases. During this phase, problematic interpersonal situations from the participants' life histories are used to exemplify identifying another person's affect, differentiating between facts and guesses, avoiding jumping to conclusions, and coming up with a solution or action plan. This action plan could include engaging in a conversation with another person to explore that person's beliefs and feelings. Role playing with the therapist or other participants is used to strengthen the participants' social skills in this phase of the program.

Two pilot studies testing the SCIT program with persons with schizophrenia have been carried out. One study (31) with 18 persons indicated that SCIT improved these persons' perception of emotion and theory of mind and reduced their attribution of hostile intent. After treatment, 94% of the participants agreed with statements as to the understandability of the program's materials, the program's usefulness and the degree to which it helped them think about their social situation and improve the way they relate to other people. Furthermore, in another study, five clinicians not affiliated with the research team that developed the program agreed with statements as to the helpfulness of the program's manual and the program's positive contribution to their clients' social cognition and interaction. Another pilot study (34) with seven persons with psychotic illnesses showed that persons who participated in SCIT program showed a significant improvement in ToM performance and no improvement in emotion perception. The results also showed a trend level reduction in symptoms and hostile and aggressive biases. Obviously, these preliminary findings must be qualified due to the limited number of participants in the intervention and the lack of control groups and comprehensive outcome criteria (31, 34). In addition to these two studies carried out with persons with schizophrenia, a recent study on the effectiveness of SCIT with persons with autism showed also that participating in the SCIT program significantly improved ToM skills (35).

A core concept in the field of psychiatric rehabilitation is the commitment to help persons with SMI to live their lives to the fullest extent possible and participate fully in their communities. Deficits in communication and in interpersonal relationships are major barriors that frustrate the efforts persons with SMI invest in achieving these goals. These deficits have also been considered to be major reasons for not treating persons with SMI with psychotherapy like interventions whose effectiveness is contingent on the client's communication and interpersonal skills. Recent theories of schizophrenia attribute these deficits to impairments of empathy and metacognition associated with schizophrenia and other SMI. This paper reviewed two interventions, the metacognitive training program (MCT) and social cognition and integration training (SCIT), which, putatively, help these persons cope

with and overcome these impairments and, thus, improve their communication and interpersonal skills.

Although research shows favorable results for these interventions, metacognitive psychiatric rehabilitation interventions for persons with psychiatric disabilities are in the pioneering stage. These interventions are based on the relatively general assumptions that such disabilities are, in part, the consequence of impaired metacognitive abilities and that training in metacognitive task performance will improve these abilities and reduce the disabilities associated with the psychiatric condition. In this sense, these interventions share the directive and pragmatic aspects of such more established interventions as cognitive and cognitive behavior therapy, illness-management and recovery, and family psycho-education.

In the introduction of this paper, mention was made of theoretical arguments and empirical evidence for distinguishing developmentally and neuropsychologically between the empathic and metacognitive facets of communication (7, 16). Theoretical and empirical research was also cited in support of the contention that an impairment of the empathic processing of the emotional state of the other may be more central to the interpersonal difficulties of persons with schizophrenia than are such metacognitive processes as ToM (7, 16). As described above, MCT is explicitly a metacognitive intervention whereas SCIT is explicitly an interpersonal intervention. However, both the MCT and SCIT interventions include attempts to integrate metacognitive processes that are relatively direct and affective (i.e., empathic) with metacognitive processes that are relatively mediated and cognitive (i.e., ToM). Throughout this paper, the suggestion has been made that elaborating the dialogical elements of these interventions could make this integration of the empathic and ToM aspects of metacognition more explicit and possibly more effective.

According to a definition of dialogue adapted from SAMSHA's (36) guide to participatory dialogue, a dialogue constitutes a relationship in which two or more persons participate as equals to explore common problems. Accordingly, establishing such a relationship to deal with the empathy and theory of mind problems attributed to a mental illness diagnosis would be a central aspect of a metacognitive intervention that integrates dialogue. Thus, a dialogue-oriented metacognitive module should facilitate establishing a trusting and symmetrical relationship in which the group facilitator and the group members learn how to use empathic and theory of mind processes appropriately. Role playing is an ideal technique for implementing dialogue within the context of a psychiatric psychosocial intervention. One way of integrating dialogue in a metacognitive intervention would be the use of role reversal carried out between persons with a SMI participating in a metacognitive psychosocial intervention and the group facilitators. The following example illustrates such a procedure.

G. is a 20-year-old man who recently received the diagnosis of schizophrenia. G. lives with his parents and attends a day care center for persons with SMI. One of G.'s activities at the center is his participation in a psychosocial metacognitive group. G. has a tendency to dominate group sessions with long complex monologues about the social rejection and oppression of people who are different. In these monologues, he often claims that the group facilitators collaborate with this social oppression. One of the group facilitators employs role playing, specifically role reversal, as a major step toward entering into a trusting and symmetrical dialogue with G. with regard to these complaints and the role that G. attributes to her. She adopts the role of a group participant and thus genuinely attempts to explore with G. the possibility that she acts as an agent charged with persuading to conform to social norms. In discussing the role play, G. says, "I now understand how I make you feel. You keep on suggesting ways of helping me getting along with others and I keep on rejecting them. I also understand how difficult it is for you to understand how oppressed your demands make me feel."

The above example shows how a technique based on a dialogical approach can engender a trusting and symmetrical relationship and, thus, facilitate both empathy and the realization of how terribly difficult it is as times to appreciate other people's internal states. A dialogical relationship naturally involves an attempt at mutual empathy

that can resolve the tension sometimes experienced by the care provider due to her or his concern for both the autonomy and needs of the care user (37).

References

1. Baumeister RF, Leary MR. The need to belong: Desire for interpersonal attachment as a fundamental human motivation. Psychol Bull 1995; 117: 497–529.
2. Anthony WA. A recovery-oriented service system: Setting some System Level Standards. Psychiatr Rehabil J 2000;24: 159–168.
3. Levinas E. Totality and infinity (A. Lingis, trans.). Pittsburgh, Penn.: Duquesne University, 1969.
4. Spaniol L, Koehler M, Hutchinson D. The recovery workbook. Boston: Center for Psychiatric Rehabilitation, Sargent College of Allied Health Professions, Boston University, 2004.
5. Mueser KT, Corrigan PW, Hilton D, Tanzman B, Schaub A, Gingerich S, Essock SM, Tarrier N, Morey B, Vogel-Scibilia S, Herz MI: Illness management and recovery for severe mental illness: A review of the research. Psychiatr Serv 2002; 53: 1272–1284.
6. Kerns JG. Verbal communication impairments and cognitive control components in people with schizophrenia. J Abnorm Psychol 2007;116: 290–305.
7. Singer T. The neuronal basis and ontogeny of empathy and mind reading: Review of literature and implications for future research. Neurosci Biobehav Rev 2006;30: 855–863.
8. Decety J, Lamm C. Human empathy through the lens of social science. The Science World J 2006; 6: 1146–1163.
9. Penn DL, Bentall RP, Corrigan PW, Racenstein JM, Newman L. Social cognition in schizophrenia. Psychol Bull 1997;21: 114–132.
10. Stanghellini G. Vulnerability to schizophrenia and lack of common sense. Schizophr Bull 2000;26:115–181.
11. Burns JK. Psychosis: A costly by product of social brain evolution in homo sapiens. Prog Neuropsychopharmacol Biol Psychiatry 2006; 30: 797–814.
12. Frith CD. The cognitive neuropsychology of schizophrenia. Hove, U.K., and Hillsdale, N.J.: Erlbaum, 1992.
13. Frith CD. Schizophrenia and theory of mind. J Psychol Med 2004; 34: 385–389.
14. Gallese V. The "shared manifold" hypothesis: From mirror neurons to empathy. J Consciousness Stud 2001; 8: 5–87.
15. Gallese V. The shared manifold hypothesis. In: Farrow T, Woodruff P, editors. Empathy in mental illness. New York: Cambridge University, 2007: pp. 448–472.
16. Langdon R. Theory of mind in schizophrenia. In: Malle B, Hodges S, editors. Other minds. Guilford Press, 2005.
17. Bellack AS. Skills training for people with severe mental illness. Psychiatr Rehabil J 2004; 27:375–391.
18. Dimaggio G, Salvatore G, Azzara C, Catania D, Semertari A, Hermans HJM. Dialogical relationships in impoverished narratives: From theory to clinical practice. Psychol Psychother T 2003; 76: 385–409.
19. Hermans HJM. The construction and reconstruction of a dialogical self. J Constr Psychol 2003; 16: 89–103.
20. Tirassa M, Bosco F M, Colle L. Sharedness and privateness in human early social life. Cogn Syst Res 2006;7: 128–139.
21. Tirassa M. Communicative competence and the architecture of the mind/brain. Brain Lang 1999; 68: 419–441.
22. Lysaker PH, Lysaker JT. Psychosis and the disintegration of dialogical self-structure: Problems posed by schizophrenia for the maintenance of dialogue. Br J Med Psychol 2001;74: 23–33.
23. Wells A, Papageorgiou C. Metacognitive therapy for depressive rumination. In: Wells A, Papageorgiou C, editors. Depressive rumination: Nature, theory and treatment. U.K.: John Wiley, 2004: pp. 259–273.
24. Beck AT, Baruch E, Batler JM, Steer RA, Warman DM. A new instrument for measuring insight: The Beck Cognitive Insight Scale. Schizophr Res 2004; 68: 319–324.
25. Wells A. Emotional disorders and metacognition: Innovative cognitive therapy. Chichester, U.K.: Wiley, 2000.
26. Moritz S, Woodward TS. Metacognitive training for schizophrenia patients (MCT): A pilot study on feasibility, treatment, adherence and subjective efficiency. Ger J Psychiatr 2007;10: 69–78.
27. Moritz S, Woodward TS, Burlon M. Metacognitive skill training for patients with schizophrenia (MCT) manual. Hamburg: VanHam Campus Verlag, 2005.
28. Moritz S, Woodward TS, Metacognition Study Group. Metacognitive training for patients with schizophrenia (MCT). Manual. Hamburg: VanHam Campus Verlag: 2007, 2nd Edition.
29. Marker K. COGPACK Manual Version 5.9 Ludenburg, Germany: Marker Software, 2003.
30. Moritz S, Woodward TS. Metacognitive training in schizophrenia: From basic research to knowledge translation and intervention. Currt Opin Psychiatr 2007; 20: 619–625.
31. Combs DR, Adams SD, Penn DL, Roberts D, Tiegreen J, Stem P. Social cognition and interaction training (SCIT) for inpatients with schizophrenia spectrum disorders: Preliminary findings. Schizophr Res 2006; 91:112–116.
32. Penn DL, Roberts DL, Combs D, Sterne A. The development of the social cognition and interaction training program for schizophrenia spectrum disorders. Psychiatr Serv 2007; 58: 449–451.
33. Brothers L. The social brain: A project for integrating primate behavior and neurophysiology in a new domain. Concepts in Neuroscience 1990; 1:27–61.
34. Penn D, Roberts L D, Munt E D, Silverstein E, Jones N, Sheitman B. A pilot study of social cognition and interac-

tion training (SCIT) for schizophrenia. Schizophr Res 2005; 80:357–359.
35. Turner-Brown LM, Perry TD, Dichter GS, Bodfish JW, Penn DL. Feasibility of social cognition and interaction training for adults with high functioning autism. J Autism Dev Disord 2008; February 2. [Epub ahead of print]
36. SAMSHA. Participatory Dialogues. A guide to organizing interactive discussions on mental health issues among consumers, providers, and family members. U.S. department of health and human services: Substance abuse and mental health services administration center for mental health services. Consumer Information Series, 2000, vol. 3.
37. Borrell-Carrio F, Suchman AL, Epstein RM. The biopsychosocial model 25 years later: Principles, practice, and scientific inquiry. Ann Fam Med 2004; 6: 576–582.