METACOGNITIVE TRAINING FOR PSYCHOSIS

MCT

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[1] *The Metacognition Study Group consists of the people credited in the acknowledgments.*

Seventh edition, version 7.4

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Acknowledgements sixth edition

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Acknowledgements seventh edition

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Recent publications on Metacognitive Training for Psychosis

A narrative review of Metacognitive Training for Psychosis (MCT) was published in Clinical Psychology Review (Moritz et al., 2014). Several recent meta-analyses confirm the efficacy of MCT in terms of short- and long-term reductions in delusions, positive symptoms, and cognitive biases, as well as improvements in insight and self-reflection (Liu et al., 2018; Lopez-Morinigo et al., 2020; Sauvé et al., 2020). Another meta-analysis by Philipp and colleagues (2019) also found MCT to be superior to cognitive enhancement interventions for patients with psychosis. In the meantime, MCT has been included in the treatment guidelines for schizophrenia in various countries (Gaebel et al., 2019; Galletly et al., 2016; Lincoln et al., 2019). You can download these and other articles at www.uke.de/mct.

DONATIONS

If you would like to support us in our effort to disseminate MCT, we would be very grateful. We promise to support and help everyone, irrespective of their financial contribution (suggested donation: **35€/$ clinicians; 100€/$ institutes/hospitals**). We guarantee that all donations will be used for the further development of MCT (future tasks include the translation of MCT into new languages and the creation of new graphics). Upon request, we will send you a donation receipt. Donations should be made payable to the following account:

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[2] *We are aware that some MCT participants are neither inpatients nor outpatients. The term patient is used in this manual to refer generally to people diagnosed with mental illness who are in treatment and is not intended to degrade or stigmatize any person with a mental illness.*

INTRODUCTION

Schizophrenia is a complex psychiatric disorder. Its core symptoms are delusions and hallucinations. The past decades have witnessed a shift in our thinking about schizophrenia, particularly its treatment. Psychopharmacological treatment with antipsychotics/neuroleptics still represents the primary therapeutic approach. However, the formerly deep-rooted reservations concerning psychotherapy for schizophrenia are now being increasingly questioned.

Why cognitive training for schizophrenia?

In view of the high number of patients who show little or no response to antipsychotics/neuroleptics (Gillespie et al., 2017) or who discontinue treatment because of side effects or lack of insight into their illness (for a review, see Wade et al., 2017), research on complementary psychotherapeutic and cognitive treatment strategies is gaining importance. Cognitive-behavioral treatment, in particular, has proven to be a useful complementary approach to psychopharmacology (Bighelli et al., 2018; Burns et al., 2014; Mehl et al., 2015).

The present metacognitive[3] training program is based on the theoretical foundations of the cognitive-behavioral model of schizophrenia but employs a somewhat different therapeutic approach that is more strongly oriented toward cognitive distortion. For an overview of the similarities and differences among metacognitive and cognitive-behavioral treatment approaches and the history of the term “metacognition,” see the review paper by Moritz and Lysaker (2018).

The main purpose of metacognitive training is to change the “cognitive infrastructure” of delusional ideation. The MCT program is comprised of modules targeting common cognitive errors and problem-solving biases in schizophrenia. These cognitive biases (like jumping to conclusions or overconfidence in errors) may, on their own or synergistically, culminate in the formation of false beliefs to the point of delusions (Freeman, 2007; Garety & Freeman, 2013; Moritz et al., 2010; Moritz & Woodward, 2007; for reviews, see Hoven et al., 2019; Lancellotta & Bortolotti, 2019; McLean et al., 2017). The aim of the sessions is to raise participants’ awareness of these distortions and to prompt them to critically reflect on, complement, or change their current repertoire of problem-solving skills. Psychosis does not have a sudden and instantaneous onset but is instead often preceded by a gradual change in the appraisal of one’s cognitions and social environment (e.g., Freeman, 2016; Klosterkötter, 1992). Enhancing metacognitive competence may act prophylactically to prevent a psychotic breakdown. Homework that is handed out to the participants at the end of each session and our COGITO app are intended to aid with the transfer of information from the sessions to everyday life. Several meta-analyses speak for the success of this approach (see previous section).

Each module begins with psychoeducational elements and a focus on “normalizing.” By means of many examples and exercises, each domain (e.g., jumping to conclusions) is introduced and the fallibility of human cognition discussed and illustrated. In a second step, pathological extremes of each cognitive bias are highlighted. Participants are shown how exaggerations of (normal) thinking biases lead to problems in daily life and may sometimes even culminate in delusions or other symptoms. This is illustrated with case examples of people with psychosis, providing an opportunity for group participants to share their own experiences if they feel so inclined. In this way, patients learn to detect and defuse “cognitive traps.” Dysfunctional coping strategies (e.g., avoidance or thought suppression) are also brought to focus in this context, along with methods for replacing them with more helpful strategies.

[3] *Metacognition can be described as “thinking about one’s own thinking” and involves the ability to select appropriate responses to environmental and social challenges/problems. It also encompasses the way we appraise and weigh information and how we cope with cognitive limitations.*

Potential cognitive contributors to the development and maintenance of delusions are attributional distortions (Module 1), the jumping to conclusions bias (Modules 2 and 7), the bias against disconfirmatory evidence (Module 3), deficits in theory of mind (Modules 4 and 6), overconfidence in memory errors (Module 5), and depressive cognitive patterns (Module 8). Despite good empirical evidence for the validity of these contributors, some remain subject to scientific debate (Freeman, 2007; Garety & Freeman, 2013; Grimes & Zakzanis, 2018; Murphy et al., 2018; Ramos & Torres, 2016; Savulich et al., 2012). In two additional modules, we deal with self-esteem (Additional Module I) and prejudices/stigma (Additional Module II) because many patients suffer from affective problems and the improvement of emotional well-being is considered a high treatment priority by patients (Moritz, Berna, et al., 2017). We recommend including these two modules regularly in the curriculum since emotional problems are increasingly viewed as important in the development of both depression and positive symptoms in schizophrenia (Freeman, 2016; Garety & Freeman, 2013; Müller et al., 2021; Murphy et al., 2018).

The modules are administered within the framework of a group intervention program. The sowing of doubt encourages patients to question their problematic thought patterns. In recent MCT versions, we emphasized the relationship between thinking styles, delusions, and psychosis because we were concerned that a symptom-oriented approach might be too stressful for participants. However, this concern has proven to be largely unfounded. Nevertheless, we do recommend that individual delusional themes be addressed in one-on-one therapeutic sessions rather than group sessions (see, for example, our individualized MCT program (MCT+) at www.uke.de/mct_plus; Moritz et al., 2014). Metacognitive training materials can be adapted for this purpose. There is meta-analytical evidence for the effectiveness of individualized versions of the MCT such as MCT+ (Liu et al., 2018). The interactive and entertaining character of the training is designed to capture participants' attention and exert a sustained impact. To meet this goal, we have also refrained from incorporating "drill and practice" tasks. Basic cognitive dysfunctions (e.g., attentional problems) are not specifically targeted because these deficits are common across different psychiatric populations and it remains unclear whether they represent specific vulnerability factors for psychosis.

Since most aspects of the program are self-explanatory, this manual is fairly short. However, reading the following sections is not a substitute for in-depth study of the underlying theoretical concepts. We highly recommend that inexperienced colleagues complete our certified online training, available at www.uke.de/e-mct.

The present program is available in many languages and can be downloaded via the following link: http://www.uke.de/mct.

The metacognitive training program consists of the following materials:

- 20 (i.e., 2 x 10) PowerPoint presentations in PDF format (two parallel cycles, each consisting of eight modules plus two additional modules)
- This manual
- Homework handouts (Modules 2 and 7 and Modules 4 and 6 have only one handout)
- One yellow and one red card for each participant
- A poster with group rules
- An app as a treatment aid (see www.uke.de/mct_app)

Before introducing the modules, some basic procedures that apply to all modules are addressed below.

Number of modules and frequency of sessions

The program consists of two parallel cycles that each contain ten modules (eight core modules plus two additional modules). We recommend leading two sessions (one module each) per week. Thus, most inpatients can complete a full cycle during a one-month hospital stay. Outpatients and patients in ambulatory intensive treatment programs should complete both cycles in order to deepen and sustain their training success. The two versions are identical in terms of their rationale. However, the introduction and exercises differ so that participants attending the two cycles in sequence are not presented the same material twice.

Group size

The group size should range from 3 to 10 participants.

Duration of sessions

Each session should last between 45 and 60 minutes.

Opening of session

Although not mandatory, it is a good idea to start each session with a brief discussion of the previous module. In addition, there should be a short introduction round for new participants, as well as a brief introduction to the program (for details, see section *Introducing the program to participants*).

End of each session

If the group has not completed all the exercises by the end of the session (which is likely to be the case), the facilitator should skip forward to the final slides, which describe the relevance of the tasks to daily life and psychosis and summarize the learning objectives. Lastly, the facilitator hands out the homework assignments and reminds the group about the COGITO app.
The facilitator gives each participant a yellow card and a red card at the end of his or her first session (see website), along with instructions on how to use them. The yellow card raises three fundamental questions that the participants should consult when necessary, for example, when feeling offended or insulted:

1. What is the evidence?
2. Are there alternative views?
3. Even if it's like that . . . am I overreacting?

These questions should prompt participants to reconsider the available evidence before drawing hasty, false, and perhaps consequential decisions. The red card, on the other hand, is an emergency card. Encourage patients to write on it the telephone numbers of people and institutions they trust who can be contacted when they need help.

Room for group sessions

The room should be quiet and have sufficient chairs and a white wall on which slides can be projected.

Necessary technical equipment

A video projector and a computer/laptop equipped with Adobe Acrobat Reader® (free download) are required. The slides should be displayed in the full screen mode of Adobe Acrobat. Please also note that the original PowerPoint slides can be adapted to a particular group's needs at no cost (https://clinical-neuropsychology.de/mct-os/).
If no projector is available, set up multiple computer monitors in the room.

Professional background of trainer

Psychologists or psychiatrists who have long-term experience with schizophrenia spectrum disorder patients are ideal facilitators of the group sessions. Psychiatric nurses and occupational therapists specialized in psychiatric disorders may also administer the program well. Trainers should have experience facilitating group sessions. In addition to reading the manual, we recommend that all trainers participate in our e-learning (www.uke.de/e-mct).

Dealing with psychotic symptoms during sessions

If a group member displays severe psychotic symptoms during sessions, their ideas should neither be supported nor challenged in front of others. Individual delusional ideas should be addressed in face-to-face sessions with the patient's therapist. However, patients who are distanced from their delusions may talk about similar experiences during exercises addressing common delusional themes (e.g., Module 1, scenario "A friend is talking behind your back"; Module 5, false memories; Module 6, scenario in which two men appear to be angry about a third man). Additionally, the slides entitled "Why are we doing this?" (at the beginning of each module) and "What does this have to do with psychosis" (at the end of each module) may provide opportunities for further individual reflection.

Rules for group members

On the MCT website, you can download a slide that lists important group rules (e.g., respect the opinions of other members). It is a good idea to print this out and mount it on a wall where all group members can read it. Refer to the rules from time to time, for example, when conflicts arise or when several new members have joined the group.

Advice for trainers when presenting video clips

The link http://www.uke.de/mct_videos offers video clips related to the topics of each of the different modules. Some clips are only available in German, English, and French. Others are language-free and can therefore be used in any group. Some movie clips contain language that may not be appropriate for all audiences and across all cultures. Please carefully screen any videos that you consider using before showing them in a group session. After the video presentation, discuss with patients how the video is relevant to the specific topic of the module. Alternatively, you may do a role-play or discuss individual experiences of patients. Or, you may also choose not to show a video and simply move on to the next exercise.

Introducing the program to participants

Metacognitive Training is an open program. Patients can enter at any point during the cycle. New participants should be briefly introduced to the program—preferably by experienced participants with the help of the trainer. First, introduce the term metacognition: meta is Greek for about, and cognition refers to higher mental processes such as attention, memory, and problem-solving and can be roughly translated as thinking. Thus, metacognition means thinking about the way we think, or thinking about our own thinking (for a review, see Moritz et al., 2019). The aim of the program is to learn more about human cognition and how we can shape it to optimize problem-solving. At the heart of the program are thinking styles that may contribute to the development of delusions; however, remember that not all patients will display all of these thinking biases concurrently.
Regularly point out the relationship between the learning objectives and the participants' daily life and illness. For this purpose, each module includes several slides emphasizing the practical relevance of the module (e.g., slides entitled "Why are we doing this?"; "How jumping to conclusions [or another bias] promotes misinterpretations during psychosis—examples"; "What does this have to do with psychosis?"). Transferring the learning objectives to daily life is the foremost goal of the training.

Inclusion and exclusion criteria

1. Patients with schizophrenia and schizophrenia spectrum disorders are the primary target group. The program is also suitable for patients with other diagnoses who have recently or in the past displayed psychotic symptoms (particularly delusions, ideas of reference, and hallucinations).

2. Patients should be able to attend to the content for the duration of a session. For highly distractible patients, the training sessions may be too stressful. Nevertheless, participation should be attempted.

3. Present delusions and hallucinations do not constitute exclusion criteria unless strong self-referential delusional misinterpretations occur. Manic patients showing inappropriate behavior (antisocial, sexual, hostile) may not be able to participate unless symptom remission occurs because of the potential disruption to group dynamics.

4. If a patient misses a session, repeating the session is not necessary as the program does not require participation in a particular order.

COGITO App

COGITO is a free self-help app. Users can select different program packages. Two scientific studies have confirmed the effectiveness of the app on depressive symptoms and self-esteem (for more information, see www.uke.de/cogito_app). The self-help exercises are based on cognitive behavior therapy (CBT) as well as Metacognitive Training (MCT) and are designed to reduce emotional problems such as sadness and loneliness and also to improve delusional ideation. The exercises take just a few minutes and can easily be integrated into everyday life. Up to two push messages per day remind the user to do the exercises regularly (optional feature). Users can also create their own exercises or modify existing exercises. Depending on the number of exercises they complete, users can collect virtual medals (bronze, silver, and gold).

Atmosphere

1. The group sessions should not be rushed. Completing all slides within one session is not required and is in fact almost impossible. Although the training is highly structured and has a clear focus on the exercises, lively discussion should be encouraged and participants should have enough time to exchange their views. Social interactions and exchanges are core factors for gaining self-awareness and changing behavior in everyday life.

2. Some patients feel uncomfortable speaking in front of others. These participants may be involved by asking them simple yes/no questions or by asking them to participate with hand signals (e.g., "Who else shares this opinion?"; "Is there anybody who has already made a decision . . . ?"). Hand signals can be used to indicate the certainty of judgments (hand raised high = highly confident, hand raised halfway = some doubt). However, participants should not be forced to engage, and the trainer should be nonpatronizing and supportive.

3. From time to time, the trainer should highlight the basic rules of interpersonal engagement (e.g., listen to other people, show respect for different opinions), particularly when problematic communication patterns are observed. Each participant should have the chance to actively take part, and the discussion should not be dominated by one person. A pattern of taking turns can be established so that each member has the opportunity to contribute, or the trainer may assign a particular participant to respond.

4. Create a friendly and even appropriately humorous atmosphere. The exercises should be entertaining, interactive, and playful. Critical comments from patients toward other group members should be discouraged.

In the following sections, we outline the target domains, basic tasks, and theoretical rationale for each module. These sections also contain the objective of each module as well as general and specific recommendations for leading the modules.

MODULE 1: ATTRIBUTION - BLAMING AND TAKING CREDIT

Target domain

Attribution bias (especially external-personal attribution for failure); monocausal inferences

Basic task

In the first part of the module, participants are familiarized with extreme attributional styles and their possible social consequences (e.g., blaming others for failure may trigger interpersonal tensions). Participants are encouraged to come up with more objective and balanced explanations for each scenario (e.g., sharing success with others instead of only praising oneself). In the second part, participants should generate possible explanations for specific situations, such as why a friend has not called (negative) or why someone invited them for dinner (positive). Situational and personal factors should be taken into account. Please note that there are no clear-cut solutions for these exercises. Instead, a number of different possible explanations should be considered, even if only one explanation seems valid at first (e.g., “A friend is talking behind your back”; possible explanation: “The person is not a true friend”; alternative interpretations: “That person asked other people whether I was ill. He did not want to ask me directly since I could be upset or worried”; “This is normal; we all gossip from time to time. This does not mean we are bad people”). The second task set incorporates a section on voice-hearing. The participants are confronted with several arguments as to why internal voices (voice-hearing) are in fact self-generated and not inserted from the outside.

Sources of materials

The design of the second task set is inspired by the Internal, Personal, Situational Attribution Questionnaire (IPSAQ; Kinderman & Bentall, 1997). The contributions of photographers and/or artists are acknowledged at the end of the presentation.

Theoretical background

Bentall, Kinderman, and coworkers (Bentall et al., 1991, 1994, 2001; Kinderman et al., 1992; Kinderman & Bentall, 1996, 1997) have repeatedly found that paranoid patients have a bias toward blaming others for their failures (see also Janssen et al., 2006; for reviews, see Murphy et al., 2018 or Trotta et al., 2020). Conversely, patients attribute success primarily to themselves as opposed to others, although this style is less well confirmed in the literature (Martin & Penn, 2002; for a review, see Garety & Freeman, 2013). A self-serving bias (externalization of blame, internalization of success) is often exaggerated in patients with schizophrenia (Müller et al., 2021). To some degree, this bias also exists in healthy individuals (as folk wisdom reminds us, “The bad workman blames his tools”). However, external attribution of failure seems to be pathologically pronounced in paranoid patients and is shifted toward the personalization of blame. In our own studies, we have observed a variant of this pattern in which acutely deluded patients attribute the source of both positive and negative events less frequently to themselves in comparison to controls. This suggests that patients may suffer from a perceived loss of control (Moritz et al., 2007). There is also mounting evidence that individuals with schizophrenia have a higher tendency to make monocausal inferences (Moritz et al., 2018; Nowak et al., 2018; Randjbar et al., 2011).

Objective of the module

Participants are encouraged to generate explanations for different situations by considering three possible sources (alone or in combination): oneself, others, and situational factors. The objective is not to lead participants to a definitive answer. Rather, different possibilities should be contemplated, which helps to change dysfunctional attributional patterns (e.g., “It’s always my fault” vs. “It’s always the other person’s fault”). Advantages and disadvantages of both a depressive attributional style (attributing failure to oneself and success to luck or coincidence decreases self-esteem) and a self-serving bias (attributing failure to others and success to oneself may lead to social conflict as others may get upset if they are blamed without good reason) should be underlined.

The primary focus of this module is to point out that multiple factors can lead to the same incident/scenario. As noted, this holds true even for situations where at first only one explanation seems possible.

General advice

On slide 5 of the presentation, collect different explanations for an event. Subsequently, group the answers according to three possible origins: oneself, others, or the situation. This classification should also be applied to the scenario in slide 9. On slide 12, put forward more balanced responses, ideally incorporating aspects of the aforementioned three possible causal sources. The responses serve as examples, not as definite solutions. The opinions of group members may well deviate from these. On slides 14-23, ask participants to come up with potential consequences of the different attribution styles.

For the second part of the module, create examples or ask participants to share personal experiences of misinterpretations. However, the discussions should not become too person-specific. There are many exercises, so long reflections on a single slide should be avoided. Once several alternatives have been put forward, ask the group to select the most plausible cause. Occasionally, vary the response mode by asking, for example, how a person who is currently suffering from depression or who may feel persecuted would attribute the event. For the section on voice-hearing, adopt an open attitude. Encourage participants to consider alternative attributions for voice-hearing, but do not force them to agree with a more rational explanation. Insight into the irrationality of voice-hearing is a gradual process that cannot be achieved in a single session. This section aims to plant the seed of doubt regarding the authenticity of the voices and to raise metacognitive awareness rather than to immediately convince participants of counterarguments.

Specific advice (examples)

Note that some of the attributions below represent more than one possible source. Following the brainstorming phase, discuss the plausibility of each explanation.

Scenario	Attribution		
Cycle Ⓐ	Myself	Others	Coincidence / Circumstances
1. Complaint	My arguments were convincing.	The salesman is very fair.	• This is a common procedure in this shop. • I bought the item yesterday. I am just exercising my rights as a customer.
2. Silence	I am not dressed properly (unlikely but possible).	• They have nothing to talk about. • They are nosy and want to know who entered the room.	• There was a short break between two presentations. • The door creaked; people were irritated and paused.
3. Looking rough	• I feel bad. • I am ill.	• This person says that to many people; it's just a phrase. • This person wants to insult me. • This person wants to express concern.	Everybody at my workplace was on holiday except for me. Maybe I do not look as well rested as they do.
4. Failing an exam	• I did not study properly. • The exam did not test my strengths.	• I was distracted by some noisy students in the hallway (possible but an unlikely single cause). • The test grader/teacher was extremely strict.	Everyone failed the exam; it was very difficult.
5. Dinner	I did him a favor (e.g., I helped him with his work).	• He is very generous. • He wants to apologize for something.	• He has won the lottery (unlikely). • It's my birthday.
6. Freeway	I drove too fast.	The police officer is in a bad mood; he is just trying to bully me (possible but unlikely).	This is standard procedure.
7. Winning a game	• I am an excellent player. • I cheated.	• The other players did not know the game very well. • They let me win.	It was luck; I just had good cards.

Scenario	Attribution		
Cycle Ⓐ	Myself	Others	Coincidence / Circumstances
8. Scratch on a car's finish	I tried to unlock the door and the keys slipped.	• The children from the neighborhood played a prank. • My neighbor does not like me.	This can easily happen without any bad intentions since cars have to park close to each other in this parking lot.
9. High blood pressure	I did not follow the doctor's recommendations and did not take my medication as prescribed.	The doctor is a novice and took the incorrect blood pressure reading (unlikely).	• High blood pressure runs in my family. • The device is broken (unlikely). • Due to anxiety, my blood pressure was high at the time (e.g., so-called white coat hypertension).
10. Refusing to help	I did not help her either when she asked me.	• She generally does not help with these kinds of tasks. • She believes that I can manage on my own.	She is very busy at the moment.
11. Receiving a present	I helped her out.	She is a generous person.	• It's my birthday. • I passed an exam.
12. Being regarded as stupid	I made a big mistake.	He wants to hurt me because he is angry with me.	• There's a misunderstanding between us. • This was not meant literally.
13. Crying baby	I am unfamiliar with handling babies and held it wrong.	The baby was not fed on time.	• Babies just cry from time to time for no reason. • The baby was stung by a bee when I was holding it (possible but unlikely).
14. No respect	I lied to him or cheated him.	He has very high moral standards that, from his perspective, I do not meet.	This is a misunderstanding; he heard a false rumor about me.

Scenario	Attribution		
Cycle Ⓑ	Myself	Others	Coincidence / Circumstances
1. Talking behind your back	I did something he/she despised.	• He/she often talks about other people behind their backs. • It is only human to gossip a bit about other people; this is not necessarily a hostile act.	My birthday is coming up, and they are planning a surprise party.
2. Being invited to a job interview	• I submitted a very good application. • I am very qualified.	A colleague from the company recommended me.	Every applicant has been invited.
3. A friend is unpleasantly surprised by unexpected visit	I have recently overstrained her hospitality.	She does not like unannounced visits.	• She had a party at her flat yesterday and the place looks messy. • She already has visitors.
4. Others laughing while you are talking	• I made an embarrassing slip of the tongue. • I made a good joke.	• Someone told a good joke at the same time, which I did not hear. • The others are always very silly and laugh about nothing. • They drank too much alcohol.	It is New Year's Eve - everybody is in a party mood.
5. Being given a ride home	I have given him a lift many times before.	• He cares about others. • He likes me.	We live very close to each other; it was just on his way.
6. Being stood up	I told him the wrong time (possible but unlikely).	• He is forgetful. • He does not think I am important enough (unlikely).	He was held up; for example, his car broke down or he missed the bus.
7. Not receiving a postcard	I never sent him a postcard either.	• He generally does not send any postcards. • He took on too much, so he did not have time to send one.	• His vacation was just too short. • The postcard got lost in the mail (unlikely).

Scenario	Attribution		
Cycle Ⓑ	Myself	Others	Coincidence / Circumstances
8. A car is driving behind you	I am driving irregularly and a police car is about to stop me (possible but unlikely).	The person thinks I am interesting and wants to know where I live (unlikely).	• This is pure coincidence; the other driver is going to the same place. • There is only one street in this area (e.g., a free-way).
9. Bus driving off	I did not run fast enough to catch it.	The bus driver is having a bad day.	The bus driver did not see me.
10. Invitation for a drink	I helped him move into his flat.	• He wants to get to know me better. • He loves wine and wants to show me his collection (possible but unlikely).	• He only just moved in. • It is a house-warming party.
11. Man reading a paper	I placed an ad in the paper to sell my apart-ment. The man is just killing time until the official viewing starts.	• He lives across the road and lost his key. He is waiting for the locksmith. • His girlfriend is visiting me; he is jealous and is spying on her (unlikely).	Next to my house is a corner store.
12. Being told you were unfair	• I cheated in the game. • I said bad things about him.	He is very sensitive and is easily insulted.	This is a misunderstanding.
13. Being told you are smart	• I am smart. • I said something smart.	• He always asks simple questions. • He likes me and wants to boost my self-esteem.	I saw the answer to his difficult question in a quiz show the night before.

MODULE 2: JUMPING TO CONCLUSIONS I

Target domains

Jumping to conclusions bias; bias against disconfirmatory evidence

Basic task

Possible consequences of jumping to conclusions are illustrated using several examples at the start of the module. In the section “jumping to conclusions ‘in action’—urban legends” the group discusses urban legends/modern false beliefs (e.g., “Paul McCartney is dead” legend in cycle A). Arguments for and against this belief should be collected, exchanged, and evaluated for their plausibility. It should be made clear that legends of this kind arise due to jumping to conclusions and are founded on dubious evidence. Thus, they are a good model for delusional ideas.

Exercises in the first set of tasks show drawings of common objects (e.g., a frog), which are displayed with increasing detail. New features are added in eight successive stages until the entire object is eventually displayed. In alternating order, ask participants to rate the plausibility of either self-generated or pre-specified interpretations. Participants should withhold their decision until sufficient evidence has been presented. For example, the first stage of the “frog” exercise strongly resembles a lemon as only the outline of the frog is displayed. A hasty decision consequently would result in an error.

In the second task set, picture puzzles are shown that, depending on the observer’s perspective, contain at least two different objects or scenes (e.g., the first picture in cycle B concurrently shows the profile of an old man and a street scene by night). Participants are asked to give their first impression of the picture and then to change their perspective in order to see the alternative figure or scene.

Sources of materials

Objects in the first task set are simple black-and-white drawings from a picture book. The contributions of other photographers and/or artists are acknowledged at the end of the presentation.

Theoretical background

We previously used some of the stimuli from the first task set in a study on schizophrenia (Moritz & Woodward, 2006b). In line with prior investigations (Woodward et al., 2006), schizophrenia patients exhibited a decreased ability to revise their ratings of incorrect interpretations. This response pattern has been termed “bias against disconfirmatory evidence” (Woodward et al., 2006) and has been confirmed independently (Balzan, 2016; Eisenacher & Zink, 2017; McLean et al., 2017). Even when presented with emerging “counter-evidence” against interpretations that initially appeared plausible, patients cling to their original choice more than both healthy and psychiatric controls. Finally, numerous findings suggest a jumping to conclusions data-gathering bias in patients with schizophrenia (for reviews, see Balzan, 2016; Dudley et al., 2016; Garety & Freeman, 2013; McLean et al., 2017; So et al., 2016; Ward & Garety, 2019), indicating that such patients make hasty decisions. Thus, judgments are made on the basis of incomplete evidence. A variant of this account is the “liberal acceptance” theory (see Moritz, Pfuhl, et al., 2017).

Objective of the module

Participants are trained to avoid succumbing to first impressions, which may eventually prove to be wrong (first task set) or only reveal half-truths (second task set). Things and situations can change over time, and increasing evidence often casts a different light on things. Therefore, alternative views and attitudes should not be dismissed prematurely. In our study, the pictures for the first task set did not elicit a jumping to conclusions pattern in schizophrenia patients (Moritz & Woodward, 2006b), but the exercises are well suited to demonstrating the disadvantages of such a response style.

General advice

Point out the pros and cons of a hasty vs. a hesitant response style at the start of the session. If the stakes are high and there is sufficient time, all available evidence should be considered before making a final decision. The consequences of a jumping to conclusions bias can be momentous, which is illustrated by several examples (e.g., medicine: false diagnoses). Give participants the chance to relate their own experiences (e.g., during psychosis). Ask patients to indicate their response confidence, for example, by raising their hands halfway to express doubt or fully to express high confidence (offering the choice of certain vs. uncertain is better for illustrating overconfidence than using percentages). Patients should learn to be less confident if the evidence is incomplete.

In half of the exercises in the first task set, participants have to come up with their own interpretations/ideas. For a better overview, ask participants to write these down on a flipchart or whiteboard (optional). Re-evaluate the validity of each interpretation after each new piece of the image is revealed. Participants may raise their hands to indicate whether they have a new idea or have already made a decision. Discuss with participants which particular features of a picture speak for or against a particular interpretation.

In the picture puzzles of the second task set, the trainer has to ensure that all participants can discover the two different objects. If a patient cannot see both solutions, another participant may help by pointing to specific clues (e.g., in the first picture of the second task set in cycle B, the dog on the street can also be seen as the old man's hand).

Specific advice

Example (Cycle B, second example, frog):

When performing this task, many participants prematurely decide for the response option "lemon." In this case, the trainer may emphasize that seven more fragments of the image are still to come. A lemon could probably be completed immediately after the first drawing and therefore represents a rather unlikely alternative.

You may alternate between the first and second task sets. The tasks can be done in any order.

MODULE 3: CHANGING BELIEFS

Target domains

Bias against disconfirmatory evidence; jumping to conclusions bias

Basic task

Following a brief introduction, the confirmation bias is demonstrated through a short task. Three objects are presented (Cycle A: three flowers; cycle B: three kinds of fruits). Participants are asked to think of a superordinate category that subsumes the presented objects by suggesting new objects for the category (the superordinate categories for these two tasks are living beings and food).

Asking for yes/no answers, the trainer provides feedback as to whether or not the new objects being presented fit into the superordinate category. The objects presented mislead many to believe that the superordinate categories are flowers and fruits. Therefore, most people come up with objects that fit into these categories instead of trying out alternative hypotheses or critically testing their assumptions with other items. The confirmation bias is a powerful response bias that occurs when people ignore sources of information (e.g., certain newspapers or TV news programs) that do not match their pre-existing opinions and attitudes. Even if some group members are already familiar with the exercise and provide the correct solution, do not confirm the correct solution right away but invite suggestions from other members.

The main exercises consist of a series of three pictures shown in reverse order. The series of pictures gradually reveal an initially ambiguous plot (example from cycle B: man is leaning over a fence and watching a barking dog; in the following two pictures, it becomes clear that the man has just escaped the dog by climbing over the fence). For each picture, ask participants to rate the plausibility of four different interpretations. The correct interpretation is highlighted at the end of each set of pictures. One of the four interpretations appears improbable on presentation of the first picture but in most cases eventually proves true (in the example above: "The man has just escaped from the barking dog"). Two of the other interpretations appear plausible on presentation of the first picture but are eventually proven wrong (e.g., "The man is playing with his neighbor's barking dog"; "The man has just built a fence for his dog"). All exercises include at least one interpretation that is always unlikely no matter how many pictures have been presented. The examples are comprised of three different conditions that are presented in random order:

- *revealed-on-first* (the most plausible interpretation upon presentation of the first picture is valid)
- *revealed-on-second* (the story plot is revealed on presentation of the second picture), and
- *revealed-on-third* (the story plot is revealed on presentation of the final picture)

Sources of materials

Most of the picture sequences were inspired by the Picture Arrangement subtest of the Wechsler Intelligence Scale.

Theoretical background

Using these picture sequences, we have repeatedly found that patients with schizophrenia exhibited a bias against disconfirmatory evidence (Sanford et al., 2014; Veckenstedt et al., 2011; Woodward et al., 2006; for reviews, see Balzan, 2016; Eisenacher & Zink, 2017; McLean et al., 2017).

Patients with schizophrenia were less able to revise their former preferences for incorrect interpretations in the revealed-on-second and revealed-on-third conditions. This pattern of results was particularly pronounced in patients with current paranoia symptoms in the revealed-on-third condition (Woodward et al., 2006; for a meta-analysis, see McLean et al., 2017). Another study suggests that a bias against disconfirmatory evidence may also occur in nondelusional schizophrenia patients (Moritz & Woodward, 2006b).

Objective of the module

As in Module 2 (Jumping to Conclusions I), explain to the group that it is often important to resist the normal tendency to stick to first impressions as this response bias fosters faulty decisions. It is therefore desirable to maintain an open mind.

Specific advice

Beginning with slide 3, several questions are raised that should be answered by different group members. For the picture sequences, ask participants to (1) indicate their preferred interpretation after each picture is revealed (e.g., in descending order) and (2) indicate whether they have already ruled out certain interpretations. After several opinions have been put forward, ask other participants to indicate if they agree with each option by a show of hands (raising the hand halfway indicates doubt).

For each new picture, novel clues have to be detected, followed by a re-evaluation of the interpretations. Bring to the attention of those participants who have prematurely decided on an incorrect interpretation that although their interpretations might have been plausible at the beginning, the evidence has changed in the meantime. Emphasize the potential negative consequences of hasty decision-making in interpersonal contexts and delusion formation since hasty decisions may result in misunderstandings and social conflict.

Clues for detecting the correct interpretation

Cycle A	When the solution is clear	Clues for determining the correct solution (examples)
1. (fire)	second or third picture	• The boy is being praised by the adults. • If you look closely, you can see in the first picture that there is a hole in the roof of the neighboring house. However, this is a clue rather than proof.
2. (parking space)	third picture	It is not clear until the third picture that the man was unable to park properly because the adjacent cars had not used the appropriate parking spaces. However, it can also be argued that other people's poor parking does not entitle the man to ignore the parking lines as well.
3. (pizza)	first picture	• The man is holding the telephone receiver. • The dough is falling on his head. It does not seem like he is wearing the dough on purpose (which makes alternative 3 unlikely). • Tomatoes and salt in the foreground speak against alternative 4 (cake).
4. (speech)	third picture	Alternative 4 activates common prejudices against politicians that easily mislead participants to hasty and false decisions.
5. (escape)	third picture	• Because of the man's dress and his suspicious behavior, it is extremely unlikely that he is the woman's bodyguard (makes alternative 3 unlikely). • There are no particular clues that the man's clothes are wet (which makes alternative 4 unlikely).
6. (fishing)	second or third picture	It is not entirely clear until the third picture that the boy should be gardening. However, the second picture makes this interpretation very likely.
7. (pull / push)	third picture	To arrive at a definite solution, all three pictures have to be seen. The man on the left is surprised to see that the other man has entered the room as he has tried to open the door himself in vain. Apparently, the man on the left confused *push* with *pull*.

Clues for detecting the correct interpretation

Cycle Ⓐ	When the solution is clear	Clues for determining the correct solution (examples)
8. (cowboy)	first picture	• The man in the foreground has been restrained and is struggling to free himself. • The other alternatives are absurd.
9. (boat)	first or second picture	• The cat is floating away on the boat. • It does not look like the dogs caught a suspected thief. They are following the boat rather than the person.
10. (crash)	third picture	In the first picture, you can see a table in the background, but a definite decision for interpretation 3 is not yet possible. In the second picture, it could still be due to chance that the man came along with a table when the other man was already lying (perhaps drunk) on the ground.
11. (mannequin)	third picture	No particular clues.

Clues for detecting the correct interpretation

Cycle Ⓑ	When the solution is clear	Clues for determining the correct solution (examples)
1. (shark)	second picture	In the second picture, you see people running away. Footsteps in the sand are already visible in the first picture.
2. (choir)	third picture; may be guessed after the second picture	• In the second picture, you can see that the man in the front row has red cheeks (which may indicate shame or embarrassment). However, a confident decision may not be justified at this stage. • In the first picture, the conductor is listening to the choir. It could already be speculated that he is checking whether the choir is singing in tune.
3. (dog)	second picture	The dog is in front of the fence, not surrounded by it (which makes alternative 1 unlikely).
4. (washing)	first picture	• The sign suggests a laundromat. • The woman is carrying a basket.
5. (gun)	first picture	• The gun is pointed at the man on the right. • The man has his hands raised. • The men are too old to be playing “cops and robbers” (which makes alternative 4 unlikely). • If the man on the left was giving back his gun or if it was made of chocolate, the other man would not offer him money and would not look so startled (which makes alternatives 2 and 3 unlikely).
6. (umbrella)	second picture	• The girl seems to be soaked by water, not sweat (makes alternative 3 unlikely). • The father seems amused rather than threatening. • Alternative 2 remains a possibility until the end.
7. (king)	third picture	To make a definite decision, all three pictures need to be seen.

Clues for detecting the correct interpretation

Cycle Ⓑ	When the solution is clear	Clues for determining the correct solution (examples)
8. (quarrl)	second picture	• In the second picture, the boy on the right is pointing to a toy car. • The same boy looks very angry.
9. (serenade)	first or second picture	• The boy looks very angry. • It is late at night (note the moon) and probably too late to go to a band rehearsal (which makes alternative 2 unlikely). • A classical guitar is more commonly used for a serenade than for playing in a band.
10. (house)	first (if you look very closely) or second picture	• The man has a bucket in his hand. • He does not seem to be watching anything (which makes alternative 1 unlikely). • The house does not look dirty. It is also very unusual to clean the exterior of one's house (which makes alternative 3 unlikely).

MODUL 4: TO EMPATHIZE I

Target domains
Theory of mind; emotion perception

Basic task
At the beginning, participants are asked to identify basic human emotions and afterwards match them to facial expressions. Next, in order to reinforce that faces offer relevant clues to a person's internal motives but do not provide definite proof, the faces of an athlete, a psychologist, an actor, and a serial killer are shown. Participants are asked to guess which face belongs to which person. In this exercise, most people make incorrect guesses on the basis of facial expressions. Subsequently, examples are provided demonstrating that expressions and gestures may be interpreted differently depending on cultural background and age ("When in Rome, do as the Romans do" section). In the following exercise, images are presented displaying different facial expressions. Participants are asked to judge how the person in the picture might feel and to discuss the plausibility of the alternative interpretations. Afterwards, the correct answer is highlighted (often accompanied by the presentation of the complete picture).

The third task set is similar to that presented in Module 3. Note that this and the fourth task set are no longer recommended for all groups as they are too easy for many patients and should only be considered in patients with severe neurocognitive deficits. Three pictures are shown successively and in reverse order. After each picture is displayed, participants should discuss which of the three options listed at the bottom of the slide provides the most logical continuation for the sequence. For example, in one of the exercises in cycle B, a woman is shown taking a coin from her handbag. At this point, two of the three options are plausible—paying a parking meter and tipping a musician—although the smiling face of the woman provides a clue that the latter option is more plausible. The following slide disambiguates the scene further: the woman had listened to a musician. The point at which the correct storyline can be deciphered varies across exercises. For example, some exercises allow for a definite decision only after the third picture is displayed. In the last task group, four pictures are successively shown, with each picture further disambiguating the scenario. Participants are encouraged to make a judgment about the intentions of one or a number of people using the three alternatives provided.

Sources of materials
Stimuli for the third task set are used with the permission of Sarfati and colleagues (1997). The stimuli at the end have been generously provided by Martin Brüne of Bochum, Germany (Brüne, 2003). The contributions of other photographers and/or artists are acknowledged at the end of the presentation.

Theoretical background
Theory of mind deficits are well documented in schizophrenia patients (for meta-analyses, see Bonfils et al., 2017; Bora et al., 2009; Bora & Pantelis, 2013; Sprong et al., 2007). Specifically, they have difficulty predicting the actions of others, which may contribute to delusional ideation (Mehl et al., 2010; Versmissen et al., 2008). Problems with interpreting facial expressions are also well documented in schizophrenia (Phillips & David, 1995; for reviews, see Barkl et al., 2014 and Healey et al., 2016). For example, Sarfati et al. (1997) found that patients with schizophrenia, particularly those with formal thought disorder, have problems with tasks requiring situational understanding (for a meta-analysis, see de Sousa et al., 2019), presumably due to their being distracted by context-irrelevant features.

Objective of the module

The first part of this module demonstrates that although facial expressions are very important for understanding the mental state and inner feelings of a person, they can also be misinterpreted quite easily. For instance, you cannot determine whether a person is an actor or a serial killer solely by examining their face. In order to adequately interpret a facial expression, it is important to consider other sources of information (e.g., context, personal background). Participants learn to consider a variety of contextual information rather than rely on single details.

General advice

Patients should take context into account when deducing the most plausible interpretation. Stress the fallibility of first impressions and emphasize the need to remain open-minded. Patients should learn to reduce their confidence level if evidence is insufficient (doubt can be expressed by raising the hand halfway; see Modules 2 and 3). Use examples to underline the relevance of the module for daily life.

Specific advice

The tasks described in this manual can be presented in any order. The trainer may wish to switch task sets depending on the participants' performance level.

Clues for detecting the correct interpretation

There are no particular clues in task sets 1 and 2. The core learning objective is that facial expressions can be misleading and further information should be gathered before arriving at a strong conclusion. On the slide "Basic Emotions" in the first part of the module, the solutions can be deduced from the context rather than the expressions/gestures (e.g., happiness = woman's bridal veil/wedding; anger = man clenching his fist). As mentioned above, task sets 3 and 4 are considered too easy by many participants and are therefore no longer recommended.

Clues for detecting the correct interpretation

Cycle A Task Set 3	Stage at which the solution is obvious	Clues for detecting the correct solution (examples)
1. (man hanging painting)	second picture; may be guessed after the first picture	• In the first picture, the man might want to finish his drawing on the easel, but the drawing appears to be finished already (this makes alternative A unlikely). • Alternative B is absurd right from the start. • In the second picture, the man is about to put a nail in the wall, indicating that he intends to hang something up.
2. (woman with baby)	second picture	• In the first picture, the woman is walking toward her baby's crib. At this stage, her intention is unclear. All three alternatives are possible at this point. • However, she looks concerned, so alternative B is unlikely at this point. • In the second picture, you can see that the woman is trying to put out a fire, making alternatives B and C unlikely.
3. (man with garbage can)	second or third picture	• Alternative A is unlikely from the beginning. • After the second picture it appears that the man is trying to get the watch, making alternatives A and B unlikely. However, alternative B cannot be entirely discarded at this point.
4. (woman with match)	second picture	• At first, all three options are plausible. • After the second picture, it becomes clear that the woman is cooking, making alternatives B and C unlikely.
5. (woman and clock)	second picture	• Alternative A is absurd from the beginning since a clock cannot turn into a thermometer. • Alternative B could be guessed after the first picture if you look closely and notice the concerned facial expression. • The second picture indicates that the woman is cooking, making alternatives A and C unlikely.
6. (woman wearing necklace)	first (if you look closely) or second picture	• The price tag in the first picture indicates that the woman is shopping for a necklace. • The second picture shows the woman interacting with the saleswoman displayed in alternative B, making alternatives A and C less likely. • Although C cannot be entirely dismissed until the last picture, but B is most likely.

Cycle Ⓐ Task Set 3	Stage at which the solution is obvious	Clues for detecting the correct solution (examples)
7. (boy with umbrella)	second or third picture	• All three pictures need to be displayed before a definite decision can be made. • Alternative C is unlikely from the start. • In the first picture, it is unclear what the boy intends to do with the umbrella. • The second picture shows that the boy is too short to open the door unassisted. • Alternative B might be plausible after alternative A is completed.
8. (man with wet boots)	first picture	• Alternative A is ruled out immediately because it is unlikely that a man would microwave his wet shoes. • Alternative C is also unlikely as the boots are suddenly dry and in the bedroom.
9. (woman with basket)	second picture	• At first, all three options are somewhat probable, but alternative A seems most likely. • In the second picture, the woman is standing next to the fireplace and has realized that she is out of firewood (which makes alternatives B and C unlikely).
10. (man and tree)	second picture	• At first, all three alternatives are somewhat plausible. • The second picture indicates that the man is planting a tree, which makes alternative B the best option.

Cycle Ⓑ Task Set 3	Stage at which the solution is obvious	Clues for detecting the correct solution (examples)
1. (man with fishing line)	second picture; may be guessed after the first picture	• In the first picture, the man could be picking flowers, but it looks like he is digging in the ground (which makes alternative C less likely). • Alternative A seems absurd right from the start. • In the second picture, it is clear that the man is about to go fishing, which rules out alternatives A and C.
2. (woman with coin)	second picture; may be guessed after the first picture	• In the first picture, alternatives A and C are both plausible. Alternative B appears to be absurd. • Alternative A could be guessed after the first picture if you look closely and notice the woman's happy face. • In the second picture, you can see that the woman is enjoying the music, indicating that she will give the violinist some money.
3. (man with rope)	second picture	After the second picture, it appears that the man is trying to get across the canyon, making alternative B unlikely and C absurd.
4. (man with wallet)	second picture	• After the first picture, all three options are plausible. • After the second picture, it becomes clear that the man is hungry, making alternative A improbable. On close observation, it becomes clear that the man is looking at only one cake (which makes alternative B most likely). • Alternative C cannot be entirely discarded, but it seems less likely since a baguette is not displayed in the shop window.
5. (man with bottle)	first picture	• Alternative A is likely from the beginning. • Alternative B is absurd right from the start. • Alternative C could imply that the man went crazy on the island, but this is unlikely. • The first picture indicates that the man is placing a note in a bottle. The man appears to be stranded (one clue is his ripped clothes), making alternatives B and C unlikely.
6. (man with ladder)	third picture	• Alternative B is unlikely right from the start. • All three pictures are required to arrive at the correct conclusion as little information is conveyed in the first two pictures.

Clues for detecting the correct interpretation

Cycle Ⓑ Task Set 3	Stage at which the solution is obvious	Clues for detecting the correct solution (examples)
7. (man with broken glass)	third picture; may be guessed after the second picture	• To make a definite decision, you have to see all three pictures, but alternative B is most likely from the start. • In the first picture, it is unclear what the man is thinking. • If you look closely at the second picture, you may realize that the man is thirsty.
8. (man with fridge)	second picture; may be guessed after the first picture if you look closely	• Alternative C is absurd from the beginning. • Alternative A and B seem equally plausible after the first picture. • After the second picture, it is clear that the man is annoyed because of the loud music from his neighbor's house. Thus, alternative A is most plausible.
9. (man with dirty hands)	first picture	From the onset, it is clear that the man wants to wash his hands, ruling out alternatives A and C.
10. (man and sticks)	second picture; may be guessed after the first picture	• The second picture indicates that the man is camping, making alternative C the best option. • Alternative A is unlikely from the start.

Clues for detecting the correct interpretation

Cycle Ⓐ Task Set 4	Stage at which the solution is obvious	Clues for detecting the correct solution (examples)
1. (three boys)	fourth picture; may be guessed after the second picture	• In the first picture, all three options are possible. • The second picture makes alternative C unlikely. • The third picture with the two boys calling over to the third boy makes alternative A possible, but the presence of the hole in the ground makes alternative B the better option.
2. (two prisoners)	second picture, may be guessed after the first picture	• In the first picture, it is already likely that one of the men is trying to climb over the wall. • The second picture shows both men trying to climb the wall, making alternatives A and C unlikely.
3. (boy with box)	second picture	In the second picture, it becomes clear that the boy is not wrapping a present or enjoying his birthday present, making alternatives A and B unlikely.

Cycle Ⓑ Task Set 4	Stage at which the solution is obvious	Clues for detecting the correct solution (examples)
1. (two boys with tree)	third picture; may be guessed after the second picture	• In the first picture, all three alternatives are possible. • The second picture makes alternative A improbable. • The third picture makes it clear that the boy will help his friend, making alternative B the best option.
2. (boy with bag)	second picture, can be guessed after the first picture	After the second picture, it is possible to infer that the boy is playing a trick on his girlfriend (alternative C).
3. (two boys and candy store)	third picture, may be gues-sed after the second picture	After the second picture, it is plausible that the boys are up to something, but it does not become clear that they want to rob the store until the third picture, which makes alternatives A and B unlikely.

MODULE 5: MEMORY

Target domain
Overconfidence in errors

Basic task
Visual stimuli from the Deese-Roediger-McDermott, or false memory, paradigm are presented (Miller & Gazzaniga, 1998; Roediger et al., 2001; Roediger & McDermott, 1995). This paradigm is known to induce false memories in 50–80% of healthy subjects. In cycle A, a typical beach scene is initially shown (e.g., children playing, people sunbathing, water), but objects that one would naturally expect on a beach (i.e., a ball, towels) are left out. Participants usually later recall having seen these plausible, yet missing, objects.
By means of the first two false memory pictures, as well as a brief description, participants are familiarized with the false memory effect. After that, participants are instructed to look at the following pictures carefully and to recall each item as vividly as possible in order to avoid the false memory effect. Each picture (display time 15 to 30 seconds, depending on the performance level of the group) is followed by a recognition task in which participants have to decide whether an item had been displayed or not. Several tasks encourage brainstorming about typical scenes (see General advice), which typically raises the probability of false memories.

Sources of materials
Some of the pictures were drawn by Norman Rockwell (edited by Miller & Gazzaniga, 1998). Pictures marked with © are used with the kind permission of Geobra Brandstätter GmbH & Co. KG, Germany. Several pictures have been generously provided by Stefan Merz and Frank Burmeister. The contributions of other photographers and/or artists are acknowledged at the end of the presentation.

Theoretical background
Participants with psychotic symptoms produce a large proportion of high-confident memory errors (Bhatt et al., 2010; Evans et al., 2019; Li et al., 2018; Moritz et al., 2015; Peters et al., 2013; for reviews, see Balzan, 2016; Grimes & Zakzanis, 2018; Shakeel & Docherty, 2015). Although they are fairly well convinced of the authenticity of their false recollections (for a meta-analysis on lack of corrigibility, see McLean et al., 2017), patients are typically less confident in their correct responses relative to healthy controls (Eifler et al., 2015; for a review, see Hoven et al., 2019). These distortions in memory recall (confidence gap), along with a high number of memory errors, lead to a state called knowledge corruption. A large portion of what a subject believes to be factual (subjective knowledge) is corrupt or contaminated (Moritz et al., 2008).

There is evidence that vivid recall represents a good heuristic for differentiating correct from incorrect memories. In contrast, mere familiarity or weak and vague recollections are poor proof of authenticity (Reisberg, 2001). Importantly, patients with schizophrenia appear to have less vivid recall relative to healthy participants (Cuervo-Lombard et al., 2007; Danion et al., 2005; for a review, see Danion et al., 2007). Memory judgments in patients are mostly based on familiarity and intuition (Abhishek et al., 2020; Weiss et al., 2002), making them susceptible to errors.
The false memory effect (Roediger et al., 2001; Roediger & McDermott, 1995) is an impressive demonstration of how our memory can be tricked by priming effects, logical inference (e.g., it is reasonable to assume that people who sunbathe usually lie on towels), and confusion between memories of past and current events.

Objective of the module
Although in most investigations patients with schizophrenia did not differ from controls on accuracy in the Deese-Roediger McDermott paradigm (Huron & Danion, 2002; for reviews, see Grimes & Zakzanis, 2018 or Moritz & Woodward, 2006a), their conviction regarding the accuracy of their memory errors was disproportionately high (Moritz, Woodward, et al., 2006). The present material elicits false memories in most people (i.e., irrespective of psychopathological status) and is instructive because it shows that even memories believed to be hard facts can be pseudo-memories. Participants should understand the fallibility of human memory. Our memory is constructive; it does not work like a video recorder. One of the objectives of this module is to teach participants to doubt their memory when they do not have a vivid recollection. In such cases, further proof is necessary, particularly for significant interpersonal situations (e.g., conflict).

General advice
Administer the introductory slides in a very interactive fashion (for example, ask participants about personal mnemonic aids when viewing the slide titled “How can I improve my memory?” in cycle A). In the course of the exercises on the false memory effect, teach participants that the occurrence of false memories is enhanced in situations with strong (prototypal) themes or in exceptionally stressful situations. For example, we may recall snippets from a recent argument that were not actually said but were in some way implied (subjective deduction) or were actually said in prior conflict situations. In these circumstances, it is crucial to verify our first impressions. In addition, teach participants how to differentiate true from false memories (higher degree of vividness, remembering details).
There are plenty of tasks. Do not spend too much time on a single exercise as participants may lose interest. After each picture, discuss which items were presented. Ask participants to rate their confidence level (e.g., by raising hands: a fully raised hand indicates confidence; a hand is raised halfway indicates some doubt) and ask whether they can recall specific details (e.g., color, location of object). After collecting and discussing the participants’ responses, the picture is shown again for comparison to participants’ memories. In the brainstorming tasks, after the presentation of the corresponding picture but prior to showing the picture a second time, participants are asked which objects—irrespective of the picture just presented—they would typically expect in a similar scene (e.g., classroom, pool). This enhances the false memory effect as expecting objects typically seen in these contexts often “edits” the accurate mental image.

Specific advice
none

MODULE 6: TO EMPATHIZE II

Target domain
Complex theory of mind/social cognition; need for closure

Basic task
At the beginning, participants talk about clues that help them make judgments about a person (e.g., language, gestures). Weaknesses and strengths of each criterion should be thoroughly discussed. Then, comic sequences are presented and participants are asked to take the perspective of one of the protagonists and to deduce what that character may think about another person or event.
There are two versions available for most of the tasks: a standard administration procedure and a BADE-ized administration (for more information on the BADE, refer to Module 3). The standard version presents the comic sequences all at once. It is recommended that this version be used only if time is limited. For both versions, participants take the perspective of the characters displayed.
The BADE-ized version is recommended. Here, most slides are presented in reverse sequential order, with the final picture in the sequence being displayed first. The chronologically last picture (or pictures) is (are) presented first, while the first picture(s) of the comic sequence remain(s) hidden. With each new picture, more context is provided about the story. After presenting the first picture(s) (that is, the last picture(s) chronologically), ask the participants whether the presentation of more pictures in the sequence is still necessary or if the solution is already obvious. In fact, the true chain of events is often put in a completely different light by the subsequent pictures. Clues for detecting the correct interpretation during the discussion of the standardized or BADE-ized slides can be found in the table below.
For the majority of the items in the standard as well as in the BADE-ized administration procedure, several interpretations remain possible until the end. In these cases, participants should identify what additional information is needed to make a reliable judgment. Even if a sequence remains ambiguous, discuss which interpretation is best supported by the available evidence.

Sources of materials
Picture sequences were drawn by Britta Block, Mariana Ruiz-Villarreal, and Christin Hoche. The contributions of other photographers and/or artists are acknowledged at the end of the presentation.

Theoretical background
Patients with schizophrenia have difficulty with situations that require perspective-taking and empathizing with others (for meta-analyses, see Bonfils et al., 2017; Bora et al., 2009; Bora & Pantelis, 2013; Sprong et al., 2007). A distorted perception of the motives and actions of others may easily promote interpersonal problems. Theory of mind deficits are observed in other psychiatric populations as well (Holla et al., 2020), and their pathogenetic role in delusion formation is subject to ongoing debate (Garety & Freeman, 1999). In addition, in some studies patients with schizophrenia showed an increased need for closure and certainty (Colbert & Peters, 2002; for a review, see Ramos & Torres, 2016); they had trouble tolerating open-ended episodes and ambiguity. In some cases, however, patients experience ambiguous situations as unambiguous because they do not recognize alternative explanations.

Objective of the module
The exercises demonstrate the difference between the patient's level of information as an "omniscient viewer" and the facts available to the protagonists. For example, in one exercise in cycle A, a woman is given bad news by her doctor. When she arrives late for work, her boss scolds her. From the final picture, we cannot really tell whether her boss is cold-hearted or simply unaware of the doctor's visit; it could be argued, however, that the boss should have acted more considerately since his employee likely appears devastated.

Some of the comic scenes are unsatisfactory for persons with an increased need for closure. In many scenes - as in real life - definite explanations cannot be provided. Therefore, participants should propose what additional information is needed to ultimately verify one of the hypotheses.

General advice
Let the participants take turns describing or interpreting each picture in a sequence. Intervene if descriptions go beyond what is displayed in the picture. For the core tasks, participants should imagine themselves in the position of the presented characters. One of the overarching aims of MCT is to sow doubt regarding hasty interpretations and to persuade patients to attenuate their level of confidence and abstain from hasty decision-making when the evidence is incomplete. Therefore, ask participants from time to time to rate their confidence (e.g., by raising hands: a fully raised hand indicates a high degree of confidence; a halfway raised hand indicates some doubt).

Cycle A	Standard Administration	BADE-ized Version (recommended)
1. (birthday)	Since the grandma did not openly express her disgust for toffees, the little girl may well buy grandma toffees again for her next birthday. However, it is unlikely that the grandma will be delighted about the toffees.	From the first pictures presented, it is difficult to decide what the girl would give her grandma for her next birthday. After uncovering the remaining picture of the sequence in which the grandma seems to be delighted to get toffees, it seems likely that the girl will give her toffees again. The grandma doesn't like toffees, but does not reveal this to the girl. At this point, it should be obvious that the participants possess more knowledge than the girl.
2. (bad news)	It is hard to decide if the boss is cold-hearted or not. Given the circumstances, one may be easily led to believe that the boss is overreacting. However, it is important to point out that the boss, unlike the participants, does not appear to know why the woman was late for work. The participants do not know if she is periodically late for work, making the boss's frustration understandable, or if this is an isolated incident, indicating that the boss is perhaps overreacting.	From the first picture presented (last chronological picture), it is difficult to decide whether the boss is cold-hearted or not. The second picture presented shows the woman crying, indicating that she may have a legitimate reason for being late. The final pictures revealed indicate that the woman is having health problems. It is not clear whether her boss knew she had a doctor's appointment before work or had health problems, so one cannot be certain if he is cold-hearted. Conversely, if the woman is periodically late for work, the boss's frustration would be understandable. However, in the last chronological picture, the boss may notice that the woman has been crying and, in this case, his reaction could be considered a bit too harsh.
3. (accident)	The man presumably smells of alcohol. The police officer will most likely believe that the accident has happened because the man was drunk. This is not necessarily wrong, but the participants do not know for sure whether a sober person could have prevented the accident. As the road is fairly straight, this may be an indication that the man carries the main responsibility because he might have had enough time to stop the car.	Given the information from the first presented pictures (last chronological pictures), it is difficult to deduce what the police officer is thinking. We can infer that the driver is disoriented, but we don't know whether this is only due to the car accident. As more pictures are presented, the participant becomes aware that deer were crossing the road prior to the accident. Given the information in the first chronological picture, it is clear that the man had been drinking alcohol. It is important to remember that the group has more information than the police officer. However, it is possible that the police officer smells the alcohol, leading him to think that the man's intoxication caused the accident, but the actual situation is more complex.

Cycle A	Standard Administration	BADE-ized Version (recommended)
4. (bank)	The bank clerk does not know that the boy has just bought a toy pistol. Whether the employee will be fearful depends on a number of factors (e.g., does the boy look unpredictable, does the toy gun look real, is the bank employee a fearful person?).	Based on the information in the first presented picture (last chronological picture), the participants may conclude that the bank employee could be frightened by the gun. The boy may also appear to be a small man. On the remaining pictures, the participants are informed that the gun is a toy, but the bank clerk may not perceive this. Whether the employee will be fearful depends on a number of other factors that we cannot ultimately evaluate (e.g., does the boy look unpredictable, does the toy gun look real, is the bank employee a fearful person?).
5. (boating)	Although the father and son have not heard the warning message, they have probably noticed the change in the weather (gathering clouds) and may for this reason have decided against the trip. However, if that were true, they might have cancelled the trip much earlier.	In the first picture presented (the last chronological picture), the father and son look as if they are ready to go boating. However, on a closer look participants may notice that the weather conditions may not be optimal (gathering clouds). The third chronological picture may assist the participants in concluding that the father and son should not go boating, but it is important to remember that they did not hear the warning message. With the additional information of the first two chronological pictures, we know that the weather conditions have worsened. It is likely that the father and son have also noticed that the weather has changed for the worse and decided against going boating. However, in this case, they might have cancelled the trip much earlier. They might also have noticed that the beach seems quite deserted, and this may also persuade them not to go boating.
6. (ice cream van)	The boy does not know that the girl has seen the ice cream truck at the church and may therefore think that she last saw it at the park (when he last saw her).	No BADE-ized administration available.
7. (sausage)	As the boy is apparently very hungry, the mother may falsely accuse him of having eaten all of the sausages by himself.	No BADE-ized administration available.

Cycle Ⓐ	Standard Administration	BADE-ized Version (recommended)
8. (neighbor)	A man is repeatedly unable to start his car because the car battery is dead. In view of the quarrel with his neighbor from downstairs, who has complained about his loud music (pictures 1–2), he may think that his neighbor has broken into his car and turned the lights on in order to drain the battery. However, as his battery ran out again in picture 4 at a different location, it might occur to him that he himself left the lights on because of negligence (perhaps he was somewhat absent-minded because of the argument with his neighbor).	No BADE-ized administration available.

Cycle Ⓑ	Standard Administration	BADE-ized Version (recommended)
1. (big man)	It is important to understand that the people in the café did not see the boy with the saw. Therefore, they will most likely assume that the chair cracked because of the man's weight. However, the boy had sawed a chair leg, and the chair probably would have collapsed even if a lighter person had sat on it.	No BADE-ized administration available.
2. (car)	One cannot really tell whether the woman will take the man's words as mere information, advice, or a patronizing comment.	No BADE-ized administration available.

Cycle Ⓑ	Standard Administration	BADE-ized Version (recommended)
3. (library)	Several interpretations are possible. Perhaps the man does not notice that the woman is on the phone and may therefore assume her comments are directed at him. This is supported by the fact that he poses his question without trying to catch her attention first. In this case, he might be upset. Alternatively, he may think that the woman should attend to her duties instead of making personal calls.	Based on the second picture in the sequence, participants could infer that the man does not realize that the woman is on the phone as he has just asked her a direct question. It is possible that the man thinks the woman is replying to him. On the other hand, he might think that she should be working instead of chatting on the phone. When the remaining picture is revealed, it seems probable that the woman was in the middle of a phone conversation and was not responding to the man's question. This comic sequence allows for different interpretations. It is important to emphasize that the participants have more information than the man.
4. (soccer)	In picture 1, foreigners are apparently learning the language of their host country. The content of the curriculum seems very easy (see the lesson on the blackboard), so it is reasonable to assume that their vocabulary is still poor. Therefore, they might not be able to figure out what the sign in the park means. The park ranger in turn might think that the boys are disobeying the rules on purpose. Prejudice against foreigners may also play a role. It should also be discussed whether the presence of a sign on the lawn is sufficient warning not to play soccer.	In the first picture presented (the last picture chronologically), the park ranger is likely thinking that the soccer players are blatantly disregarding the park rules by playing on the grass. By revealing the rest of the pictures, it becomes apparent to the participants that the soccer players are foreigners with a poor vocabulary. The participants can see that the content of the players' curriculum is very easy (see the lesson on the blackboard). Nevertheless, this information is not available to the park ranger, so his opinion of the situation does not change.
5. (gallery)	A man enters an art gallery. He may mistakenly think that the other two people are talking about him. Alternatively, the two visitors may complain that the man is obstructing their sight.	Based on the information given in the first picture presented (the last picture chronologically), it seems plausible that the two people in the gallery are talking about the man in front of the painting of a cat. When the remaining pictures are presented, it becomes clear to the participants that the men were previously discussing the painting, but the man may think that they are talking about him because he entered the room later.

Clues for detecting the correct interpretation

Cycle Ⓑ	Standard Administration	BADE-ized Version (recommended)
6. (sick)	The mother will only believe the boy is ill if the boy has put the thermometer in a cup of hot liquid and then shook the thermometer down to a plausible fever temperature (but this is not displayed). Otherwise, the thermometer will read too high and the mother will figure out that the boy is just pretending to be ill.	In the first picture presented (the last picture chronologically), it looks like the mother is confused by her son's condition and perhaps concerned. The third chronological picture shows the boy sticking the thermometer into a cup of hot liquid, trying to make it seem like he has a fever. This information puts the story in a different light. If the temperature is extremely high, it is possibly obvious to the mother that her son is pretending to be ill. In this case, the mother would probably be angry. The first two pictures of the sequence show the preceding course of events but do not give additional information.
7. (house)	A man has obviously forgotten the key to his house and is now climbing through his own window. The passerby may mistake him for a burglar. Alternatively, he may know the man (perhaps as a neighbor), or the owner of the house could have explained the situation to him (e.g., the owner's gesture in the second picture might be interpreted in this way)	In the first picture shown (the last picture chronologically), it looks like the man is breaking into the house. It is not until the second chronological picture that it becomes clear to the participants that the man has forgotten his house key and is not a burglar. At this point, it is important to remind the participants that the man with the dog does not have the same knowledge as the participants and therefore may believe the other man is breaking into the house. This is only true if the man with the dog does not know the man climbing through the window.
8. (twins)	The man probably thinks that Lisa (the woman he called on the phone) is sitting in the café, although she told him that she had something else to do. As he does not address by her first name, it might be assumed that he does not know her well and therefore might not even know she has a twin sister.	The man probably thinks that he is meeting Lisa (the woman on the phone) in the café. It is not until the last picture is shown (the first picture chronologically) that it becomes clear that the woman sitting in the café is Lisa's twin sister, who is named Karin. As he does not address her by her first name, it might be assumed that he does not know Lisa well and therefore might not even know she has a twin sister.

MODULE 7: JUMPING TO CONCLUSIONS II

Target domains
Jumping to conclusions bias; liberal acceptance

Basic task
Participants are shown a number of paintings. Their task is to deduce the correct title of each picture from four options. For some paintings the solution is rather obvious, but for others it only becomes clear after thorough contemplation. For some paintings, it can even be questioned whether the correct title fits the image.
In analogy to Module 2, the introduction deals with jumping to conclusions and presents a popular urban legend or conspiracy theory (example from cycle A: "Is Marlboro owned by the Ku Klux Klan?"). Arguments for and against this belief should again be collected, exchanged, and evaluated for their plausibility. It should be made clear that legends of this kind have arisen due to jumping to conclusions and are based on dubious evidence. Thus, they serve as a good model for delusional ideas.

Sources of materials
Classical and modern paintings; two pictures are taken from the Thematic Apperception Test (TAT).

Theoretical background
In prior studies, patients with paranoid schizophrenia have displayed a liberal acceptance bias for hypotheses and jumping to conclusions (Moritz, Göritz, et al., 2017; Moritz, Pfuhl, et al., 2017; for a review, see Ward & Garety, 2019; for meta-analyses, see Livet et al., 2020 or McLean et al., 2017). Relative to controls, patients gave higher plausibility ratings for absurd or improbable alternatives, indicating that patients adopt less stringent criteria for decision-making (this account is a variant of the jumping to conclusions approach by Garety et al., 1991). Further, patients do not consider all available evidence (see also Module 2; Garety & Freeman, 2013; for a review, see Eisenacher & Zink, 2017) and do not weigh information adequately (Glöckner & Moritz, 2009).

Objective of the module
Participants should learn that it is critical to invest sufficient time in finding the solution to complex problems. Sometimes, only additional information justifies clear-cut decisions, information that with only a superficial exploration would go unnoticed.

General advice
Discuss in the group the details that speak for or against a certain title. Direct participants' attention toward information they have not yet recognized (see further details below). After having discussed all details, the participants should evaluate the options for the title again.
The disadvantages of hasty decision-making can be best demonstrated by asking participants to make an assessment right after the initial presentation of the picture and then again after discussing its details. As in previous modules, ask participants to rate their level of confidence (e.g., by a show of hands: a fully raised hand indicates confidence and a hand raised halfway indicates some doubt). Do not ask for percentages because the decision certain versus uncertain may better illustrate overconfidence. If participants favor different titles, the trainer may encourage and moderate an open discussion.

Specific advice:

Picture #	Cycle A	Correct title	Clues to the correct interpretation
picture 1		“Courtship”	The following clues speak for option B: The woman’s facial expression is rather coquettish and sensual; the man has brought her a gift (a flower); the man has a devotional posture. A florist would also be expected to have a larger selection of flowers.
picture 2		“The reading chemist”	The mortar and pestle indicate a chemist, who might be studying a new formula (which speaks for option C). The fact that he is absorbed in reading, that the bottle is closed, and that no glass is on the table argue against option B. The style of his dress does not indicate a monk (which speaks against option A).
picture 3		“The poor poet”	The number of books shown in the picture indicates he is a poet (option C) rather than a servant (option A). The way he is holding his hand may indicate that he is in the act of writing poetry (option C). Even though he is living in apparent poverty, the various belongings (particularly the books) argue against the poorhouse interpretation.
picture 4		“The admonition”	The following clues speak for option D: The girl seems to feel guilty; the older woman is making a threatening gesture; the focus is on the girl (not on the boy). The boy does not have any shoes in his hands (which makes option C implausible).
picture 5		“The visit”	The man’s attention is visibly focused on the bird at the window, which requires him to lift his gaze (option A). Since the man is not looking at the book, option B is implausible.
picture 6		“Higher creatures demanded: paint upper right corner black”	If the correct title was “Depression,” the black color would probably take up a larger space (which speaks against option D). There are no further indications of National Socialism except for the black triangle, which--with a stretch of the imagination--could be misinterpreted as representing a Hitler-style haircut (which argues against option B). There is no evidence for option A. The German title of the picture (“Höhere Wesen befahlen: rechte obere Ecke schwarz malen”) is written as a sentence in the picture on a white background (option C).
picture 7		“Hunting accident”	The red nose of the man makes option B plausible. The scared face of the man also makes option A plausible; however, the clothing, the shotgun, and the tumbling man support option D.
picture 8		“The Cossack letter”	One of the men at the table is holding a pen in his hand (which speaks for option B). The men are not arm wrestling; the Cossacks seem to be in a cheerful mood and apparently are not preparing for battle (which makes option D implausible).

Specific advice:

Picture #	Cycle A	Correct title	Clues to the correct interpretation
picture 9		“The eyeglasses salesman”	Adults and children are trying on eyeglasses (tested by reading the newspaper); the bearded man is offering glasses out of his case to a woman (argues for option D). The children are not the focus of the picture, and the adults are in the majority (argues against option A). The man entering is only a background figure (option C is therefore not plausible). In order to illustrate a scholar, the artist might have depicted him at a writing table with books instead of putting him in such a social environment.
picture 10		“The water seller of Sevilla”	The man in front is wearing ragged clothes; the liquid in the glass is clear; even white wine would be more yellow; and the glass would have less wine in it if it was a wine tasting (which argues against option C).
picture 11		“The widower”	The man dressed in black is definitely looking at the women passing by. The man does not interact with the women (which makes option A implausible). The sitting man has a fairly central position in the painting (which makes option B implausible).
picture 12		“The pedicure”	The man is visibly attending to the feet and toenails of the woman. No doctor’s bag or instruments (e.g., scalpel) are visible (which makes options B and C implausible).
picture 13		“The fruit thieves”	The children or small/short men have apparently picked fruits from the tree, as there is some fruit at the bottom of the tree and one boy is still in the tree; the old man banishes them with a whip.
picture 14		“Evening prayer”	The hands of both persons are folded and their heads are bent. It is sunset. No gravestones or a priest are depicted (which makes option C implausible). The title “Hedger” (option D) does not fit with the peaceful atmosphere of the painting.
picture 15		“Awaiting the fishing boat”	The mother and one of her children are looking (wishfully?) at the ocean. The boats on the skyline and the meager clothing of the mother and children argue for a poor fisherman’s family (option B). There is no luggage for a journey and the child is barefoot (which argue against D). If the scene had described a promenade, the painter would have likely included more action in the scene (the people are standing still, which makes option A implausible). There is no specific hint of a grieving widow (but no conclusive proof against option C).
picture 16		“Boy with violin”	Most interpretations go far beyond what is visible. In fact, the boy is the famous violin player Yehudi Menuhin (as a child) before an upcoming concert. The picture comes from the TAT.
picture 17		“The love letter”	No one is moving furniture (which makes option C implausible); the picture’s atmosphere is sunny and peaceful; a topographer would likely have more professional tools (which makes option D implausible).

Specific advice:

Picture #	Cycle Ⓐ	Correct title	Clues to the correct interpretation
	picture 18	“Land tax”	The coin is an important element of the picture (which argues for option C). It is unlikely that a buccaneer would give money to a nobleman (which argues against option D). Options A and B are possible but less plausible than option C. Another argument against option A is that it is doubtful that corruption was openly depicted in medieval times.
	picture 19	“To ask for a dance”	There is a dancing couple pictured in the background of the painting. The man is bowing to a woman, which argues for option C. In addition, the group seems to appreciate his presence. The two women at the back of the table are not necessarily gossiping about him; the noise level in the room could be why they are so close. Everyone seems to be drinking alcohol, not only the man on the right (notice the beer mugs on the table; this speaks against option A).
	picture 20	“The drama”	There is a big crowd watching a scene happening on stage; there is no screen (which makes option C implausible). It is unlikely that so many people would witness a crime and not intervene (which makes option A implausible). The crowd is sitting in the dark but the scene is illuminated, just like in theaters.

Picture #	Cycle Ⓑ	Correct title	Clues to the correct interpreta
	picture 1	“Sad message”	The woman is crying; the soldier has brought her a hat and a coat (presumably belonging to her fallen husband); there is a letter on her lap (which speaks for option D). The baby does not look ill; the little boy is looking at the uniformed man and not the baby (which makes option B implausible)
	picture 2	“Soup in the monastery”	The following speak for option C: a boy with a soup bowl is leaving the monastery; there are people in the background who are presumably eating; the nun in the background has a soup kettle in front of her. The door is perhaps too unimpressive for a church (which speaks against option C).
	picture 3	“The war”	The sword, the torch, and the dead bodies on the ground hint at option A. There is no indication for the annunciation of the arrival of Jesus Christ (which makes option B implausible). Options C and D rely on peripheral details.
	picture 4	“Why did I marry him?”	he couple is apparently on a ship (porthole in the background), perhaps on their honeymoon (which speaks for option B). The man is lying on the bed with his clothes on, perhaps drunk. A bottle lies on the table next to him (which also argues for option B). The woman is too young to be the man’s mother (which argues against option D). There are no clues that this is a murder (e.g., a pistol) or a suicide (which speaks against options A and C). In the past, a red ribbon, as is worn by the woman, indicated that a woman had just been married (which also speaks for option B).

Specific advice:

Picture #	Cycle Ⓑ	Correct title	Clues to the correct interpretation
	picture 5	“Children’s games”	There are no sales booths or food visible (which makes options B and C implausible). The games (exercise, dancing, etc.) support option D. In favor of option A is the initially apparent chaos, but this is contradicted by the people playing games.
	picture 6	“Cheater with the ace of diamonds”	The red drink lends some plausibility to option C but leaves too many questions open. Option D seems plausible because of the woman’s glance; however, the card behind the man’s back (the ace of diamonds) speaks for option B.
	picture 7	“Two men contemplating the moon”	The moon is an essential element of the picture (which speaks for option B). There are no tombstones or vampires (which speaks against options A and C). Moreover, the scene appears to be peaceful. The atmosphere suggests it is taking place at night (which speaks against option D).
	picture 8	“Rest at the edge of the woods”	The women brought a big basket along; people do not seem to be agitated; no specific indications of an injury (which speaks against option D).
	picture 9	“Feeding rabbits”	The children are feeding the rabbits; there are no specific clues that it is Easter (option D). Last meal (option A) would be a macabre title and does not capture the rather peaceful mood of the picture.
	picture 10	“Mother at the cradle”	The infant is sleeping peacefully and doesn’t appear to be seriously ill or dying because of its healthy coloring (which speaks against options A and B). The mother is just sitting at the cradle, her chin is resting on her hand, and her lips seem closed, which makes singing unlikely (which speaks for option D but against option C).
	picture 11	“Dressing”	There are clothes lying on a chair in the background; the standing woman is fixing the young man’s collar, who is kneeling in front of her wearing underclothes in the fashion of that time (which speaks for option C and against option A). The atmosphere is rather friendly; the two women look neither angry nor accusatory but seem cheerful (which argues against option D). The position of the people is uncommon for a massage (which makes option B implausible).
	picture 12	“Ironing women”	There is no body to be reanimated (which makes option B implausible); the woman on the right side is ironing a dress; the other woman seems to be tired from work—she is yawning. One woman is also holding a bottle that could contain alcohol (which somewhat supports option A).
	picture 13	“Land of Cockaigne”	The flail in the picture might argue for option A. The food lying all around and the animals with cutlery stuck in their bodies argue for option B. The beheaded chicken is too small to justify the picture’s title. There are no special clues indicating food poisoning (option D).
	picture 14	“The juggler”	The man’s equipment (e.g., dog and hoop) indicates he is a juggler (option D) rather than a sorcerer (option A) or an itinerant preacher (option C). Option B might also be possible.

Specific advice:

Picture #		
Cycle Ⓑ	**Correct title**	**Clues to the correct interpretation**
picture 15	“Lunch”	The lowered heads make options A and B initially plausible, but nobody looks mournful (which makes option A implausible). One of the people is already eating (speaks against option B). Nobody seems to be speaking (which makes option D implausible). Since most of the people are eating, option C is the most plausible.
picture 16	“Girl drinking wine, with two suitors”	The woman holding a glass of wine seems to be flattered and slightly amused, and she is smiling; perhaps she has just received a compliment (which argues for option A). The presence of the second man and the fact that the woman is not looking at the man argues against option B. The woman has center stage in the picture, which further argues against option C. Furthermore, there are no lavish foods visible on the table, as one would expect if option D was correct.
picture 17	“Lady with opera glasses”	The woman holds an opera glass but no mask (which argues against option A). There are no specific clues supporting options C and D.

MODULE 8: MOOD

Target domains
Negative cognitive schemata

Basic task
First, group members are asked to list typical symptoms of depression. Following this, treatment options for individuals with depression and negative cognitive patterns are discussed. The subsequent exercises target depressive cognitive schemata. In cooperation with participants, the trainer explains how distorted cognitive schemata can be replaced with more realistic and helpful ones. The module also targets dysfunctional coping strategies often adopted by people with psychological problems. For example, people with schizophrenia have a tendency to view common intrusive thoughts or images as extremely negative and to react with a heightened level of fear (Morrison, 2001). These thoughts are subsequently strengthened by enhanced vigilance and attempts to suppress them. A feeling of alienation from one’s mental processes may take place, sometimes resulting in subjectively permeable ego boundaries (“made thoughts”) and hallucinations. Participants should learn that such thoughts may be bothersome but are commonplace. They should also learn that thought suppression counterintuitively enhances the presence and impact of negative thoughts. Instead, they are advised to observe their own thoughts from a detached perspective without interfering, like watching a storm outside or a tiger in a zoo. Finally, some techniques are provided that, when used regularly, help alter negative self-schemata and raise one’s mood.

Sources of materials
Some exercises were inspired by cognitive-behavioral textbooks (e.g., Beck, 1976) as well as from Wells’s *Metacognitive Therapy*. For a review on different metacognitive approaches, see Moritz & Lysaker (2018). The contributions of other photographers and/or artists are acknowledged at the end of the presentation.

Theoretical background
Many patients with schizophrenia complain about depressive thoughts and low self-esteem (Sundag et al., 2015; for meta-analyses, see Gerlinger et al., 2013; Tiernan et al., 2014). Rates of depression and suicide are very high in this population (for meta-analyses, see Buckley et al., 2009; Herniman et al., 2019; Hor & Taylor, 2010; W. Li et al., 2020). There is continued debate as to whether paranoid ideation is a dysfunctional coping strategy to raise self-esteem (Adler, 1929; Bentall et al., 2001; Kinderman & Bentall, 1996; for a meta-analysis, see Müller et al., 2021), such as by enhancing one’s subjective importance during persecutory delusions (e.g., a heroic fight against evil spirits: the more enemies, the more honor) or creating a new, fantastic purpose in life (Moritz, Werner, et al., 2006; for a review, see Lancellotta & Bortolotti, 2019).
It is not the intention of the MCT program to raise participants’ self-esteem to unrealistic heights. Therefore, we did not incorporate “positive thinking” phrases like “I am a special person,” which may well be reasonable for nonpsychotic patients. The goal instead is to foster a realistic sense of self among the participants.

Objective of the module
Participants are introduced to dysfunctional thinking styles, which may contribute to the formation and maintenance of depression and low self-esteem. It should be emphasized that with regular training these cognitive styles can be corrected.

General advice
This module differs from other MCT modules as no conventional tasks with correct versus incorrect response options are provided. It is crucial that the trainer is familiar with the cognitive-behavioral model of depression that underlies this module.

Special advice
In the tasks, allow the participants to independently find examples of more helpful, positive, and balanced evaluations before giving possible response options.

MODULE 9 (ADDITIONAL MODULE I): SELF-ESTEEM

Target domain
Increasing self-esteem

Task
This module conveys to group members that self-esteem is a subjective dimension. No one has more or less worth than others. The difference between low versus healthy self- esteem is introduced, as well as possible sources of self-esteem. As people with low self-esteem tend to focus on their weaknesses, participants are taught to refocus on their strengths. Participants also receive tips on how to increase their self-esteem.

Sources of materials
The examples were inspired by various psychotherapy manuals (e.g., Potreck-Rose & Jacob, 2015).

Theoretical background
Many people with (paranoid) schizophrenia suffer from low self- esteem (Ciufolini et al., 2015; Moritz, Veckenstedt, et al., 2010; Sundag et al., 2015; for a review, see Gerlinger et al., 2013), which according to some researchers is etiologically linked to paranoia and megalomania (for a meta-analysis, see Murphy et al., 2018). Moreover, the successful reduction of delusions as well as increased illness insight may deteriorate mood (for a review, see Lincoln et al., 2007; for a meta-analysis, see Murri et al., 2015) Because many participants view improvement in emotional well-being a high priority for treatment (Bridges et al., 2018; Moritz, Berna, et al., 2017), we consider this topic very important (this aspect is also dealt with in Module 8).

Objective of the module
Participants are made aware of how low self-esteem emerges. They learn not to focus on the negative aspects of their lives or their (supposed) personal flaws but to instead search for and appreciate the aspects of their life that are going well. Advice and suggestions for a daily routine are given, which may help strengthen participants' self-esteem.

General advice
The tasks in this module have no clear "right" or "wrong" answers. Give the participants sufficient time to think about and discuss functional strategies that may raise self-esteem. It is important that participants recognize and are able to name their own strengths. The module is particularly suited to complementing Module 8 (Mood).

MODULE 10 (ADDITIONAL MODULE II): DEALING WITH PREJUDICES (STIGMA)

Target domain
(Self-)stigma

Task
Images of famous people are shown to the participants, some of whom suffered from mental disorders. Afterwards, paintings created by mentally ill and nonclinical individuals are shown, illustrating that people with mental disorders are able to create important and valuable things. Then, participants learn that mental disorders and even (attenuated) psychotic symptoms frequently occur in the general population. In the end, the group should be able to deal critically with prejudices against psychosis and discuss how to tackle stigma. Recommendations of how to appropriately communicate one's illness are made.

Sources of materials
Classic and modern paintings; published statistics; examples created by our team.

Theoretical background
Many psychiatric disorders, including schizophrenia, are subject to prejudice and associated with (self-)stigma (for a review, see Alonso et al., 2019) – even among mental health professionals (see review in Valery & Prouteau, 2020). This often leads to further problems (e.g., insecurities, depression), which may foster additional symptoms such as mistrust and social withdrawal. Self-esteem is often reduced as a result (Świtaj et al., 2015).

Aim of the module
The module first discusses how common mental illnesses (such as psychosis) are in the general population. By giving examples of famous people, participants are shown that experiencing mental illness (such as psychosis) does not mean that one is unproductive or worthless. Participants are made aware of how stigmatization can influence their self-esteem. This module attempts to minimize participants' self-stigma by increasing their awareness of the prevalence of mental illness in the general population. It is emphasized that mental illness, including psychosis, does not determine one's worth, and participants are taught how to appropriately deal with their illness, such as by effectively communicating about their disorder to others.

General recommendations
The tasks in this module have no clear right or wrong answers. Give the participants sufficient time to think about and discuss strategies for managing experiences of stigma. Single exercises or chapters can be skipped (e.g., there is no need to read aloud every writer's biography).

Caution
When presenting the slides on common clichés and misconceptions about psychosis/schizophrenia (e.g., that people with psychosis are dangerous), be very gentle and cautious. Only show the examples to patients if you think they are aware of these clichés and misconceptions. Otherwise, exposure to new clichés may induce new worries, which should always be avoided. Before presenting the slides, ask the group if they have come across any clichés about psychosis. Afterwards, only repeat these stereotypes to refute them.

Special note
Participants should work out helpful tips for how to deal with their disorder by creating examples for themselves.

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