Is There a Relationship Between Memory for Past Events and Motivation for Future Activities?

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Study Synopsis

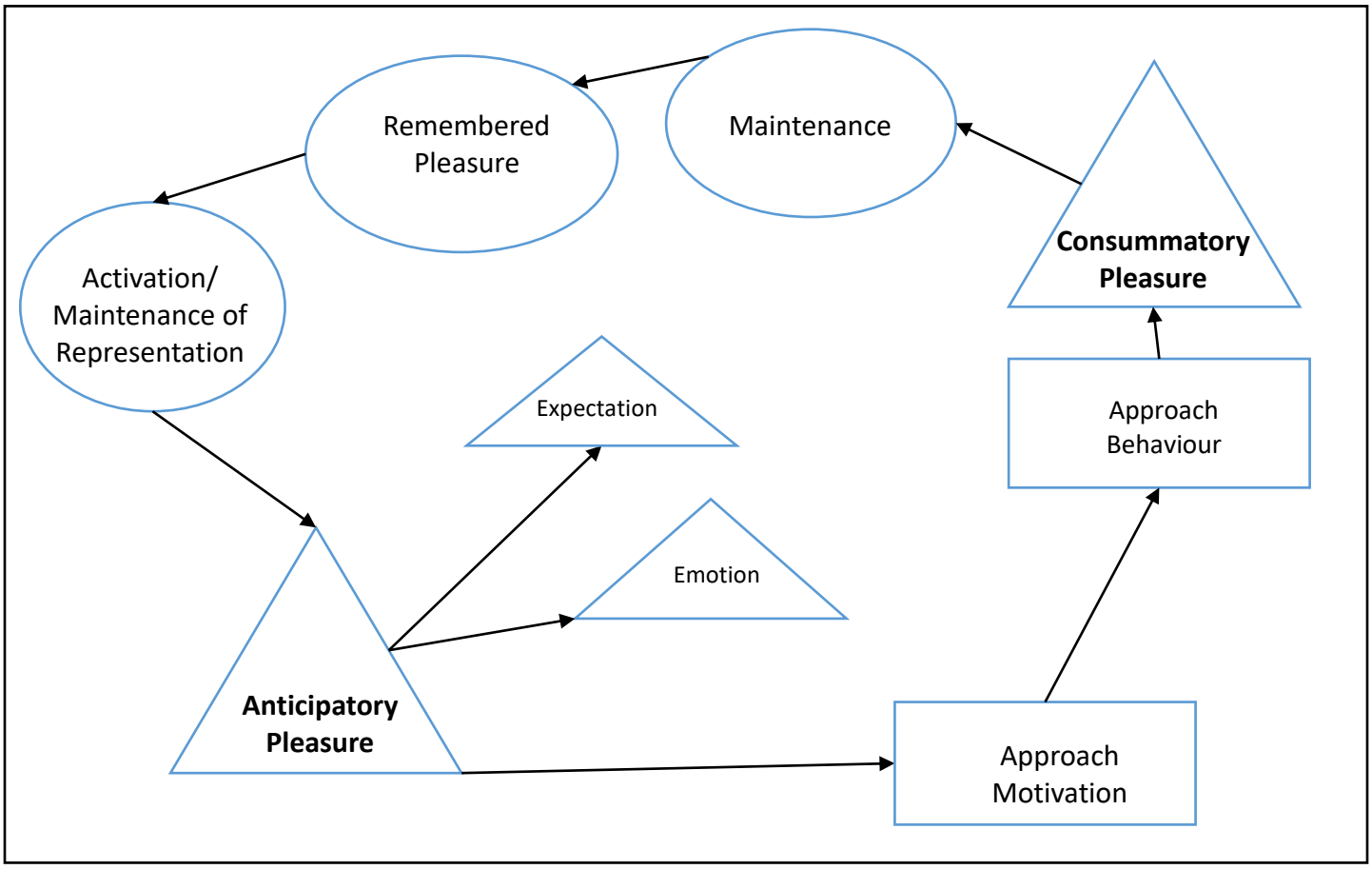
Full Title	Is there a Relationship between Memory for Past Events and Motivation for Future Activities?
Short Title/Acronym	The Relationship between Autobiographical Memory and Motivation
Protocol Version number and Date	V4 14/11/16
Study Duration	27 months
Study Design	A cross-sectional, experimental study with a pilot intervention study component.
Sponsor/Co-sponsors	South London and Maudsley NHS Trust
Chief Investigator	Dr. Clementine Edwards
REC number	
Primary objective	Cross sectional associations between autobiographical episodic memory, motivation, experience of pleasure and depression will be examined.
Secondary objective (s)	An intervention study will be conducted to further explore the potential causal role of autobiographical episodic memory in experiential negative symptoms. This will use a brief intervention targeting memory flexibility which is hypothesised to improve pleasure and motivation outcomes.
Number of Subjects	35-40
Main Inclusion Criteria	A diagnosis of non-affective psychosis (as determined by medical records). Aged 18-65yrs. A score of at least 18 on the Clinical Assessment Interview for Negative Symptoms. A good command of the English language.
Statistical Methodology and Analysis	Correlational analyses will be conducted to examine the relationships hypothesised in Part 1 of the study. The ratings provided before and after the study will be analysed in a between-groups ANOVA to assess the effect of the brief intervention on mood, motivation, anticipatory pleasure and self-efficacy beliefs.

1. Introduction

Schizophrenia-spectrum diagnoses have been shown to be among the top ten causes of disability worldwide (The Schizophrenia Commission 2012). Psychosis can be conceptualised as reflecting two main symptom clusters; positive symptoms which include delusions and hallucinations and negative symptoms which have been defined by the National Institute of Mental Health (NIMH) Consensus according to the dimensions of anhedonia and apathy, avolition and asociality, poverty of speech and blunted affect (Kirkpatrick, Fenton et al. 2006). Negative symptoms appear to play a significant role in outcomes for people with psychosis, as they are associated with poorer social functioning, work/school functioning and activities of daily living (Robertson, Prestia et al. 2014, Marchesi, Affaticati et al. 2015, Menendez-Miranda, Garcia-Portilla et al. 2015). Service users have also identified apathy and low motivation as a priority for recovery (Sterk, Winter van Rossum et al. 2013). Despite this wealth of evidence highlighting the importance of intervening to alleviate negative symptoms the only recommended treatment in the NICE (2014) guidelines is art therapy, although the evidence for its effectiveness is limited. A recent meta-analysis confirmed that available treatments show modest effectiveness at best with many having no effect at all (Fusar-Poli et al, 2014).

Many factor analyses conducted show that negative symptoms are best characterized in two broad categories; *experiential* negative symptoms such as apathy, anhedonia and asociality and *expressive* negative symptoms including poverty of speech and blunted affect (Messinger, Tremeau et al. 2011). Experiential negative symptoms, in particular, low motivation and pleasure, have been strongly linked to worse functioning and outcomes in people with schizophrenia (Fervaha, Foussias et al. 2013). One model that has been proposed for experiential negative symptoms is the Temporal Experience of Pleasure Model (Kring and Caponigro 2010, Kring and Barch 2014) (see Figure 1).

Figure 1: The Temporal Experience of Pleasure model. Triangles represent pleasure-related processes, ovals represent autobiographical episodic memory and working memory components and rectangles represent motivation and activity



The Temporal Experience of Pleasure model proposes an important role for memory in the generation of anticipatory pleasure and subsequent motivation and engagement in activity, in particular, episodic memory, which is defined as the memory for autobiographical events that can be explicitly stated. These memories for past personal experiences allow the person to figuratively travel back in time to the event that took place at that particular time and place (Tulving 1972). Autobiographical memory is a related memory system that combines episodes from a person's life with semantic knowledge about the world and the self (Conway and Pleydell-Pearce 2000). The TEP model proposes that during an activity the pleasure being experienced is maintained and then encoded into episodic memory. When the opportunity to repeat this, or a similar activity, is presented the individual retrieves relevant episodic memories and holds these representations online in the working memory (Kring and Caponigro 2010). If there is a failure to either encode the pleasure and activity into memory or retrieve it then this may lead to failure to anticipate pleasure from and then repeat that activity. This model therefore suggests that episodic memory may be an important therapeutic target in the context of the negative symptoms of schizophrenia, however the existing literature is unclear. Several studies report impairments in episodic memory in people with schizophrenia (Berna, Potheegadoo et al. 2016). However, there are mixed findings regarding whether there is a link between these impairments and experiential negative symptoms with some studies reporting an association and others not (Harrison and Fowler 2004, Ricarte, Hernandez et al. 2014, Berna, Potheegadoo et al. 2016). The methodology used across studies to assess memory is relatively consistent, with the autobiographical memory test

(Williams and Broadbent 1986) utilized in the majority of studies. This task may have some limitations due to its reliance on event cue words e.g. "birthday" rather than specific prompting of episodic memories of a particular valence, reducing its ecological validity. It may be more valid to prompt the recall of *autobiographical* episodic memories from an individual's life history. A further limitation of this evidence base is the negative symptom measures used such as the Positive and Negative Syndrome Scale (Kay, Fiszbein et al. 1987) and the Scale for the Assessment of Negative Symptoms (Andreasen 1984). These have been criticized for not accurately discriminating between current and anticipated pleasure and motivation (Messinger, Tremeau et al. 2011, Edwards, Cella et al. 2015). There is also a very mixed evidence base as to whether these older measures overlap significantly with the measurement of depressive symptoms in people with schizophrenia (Blanchard, Horan et al. 2001, Kollias, Kontaxakis et al. 2008). Indeed, over-general memory has a well-established role in the symptoms of depression and subsequent reduced functioning (Williams, Barnhofer et al. 2007) and it is not clear from the existing evidence whether memory impairments may be linked to depressive symptoms in psychosis. Recent studies in depression have also considered the importance of memory *flexibility,* specifically that it may be adaptive to generalise autobiographical positive memories and keep negative memories specific and clearly bounded (Hitchcock, Mueller et al. 2016). This emphasises the importance of considering the valence of the memory being retrieved which may therefore have a different relationship to negative or depressive symptoms.

To improve the effectiveness of cognitive-behavioural therapies for psychosis, an interventionist-causal method is recommended (Freeman 2011). The premise of this approach is to focus on one causal mechanism, demonstrate whether it can be altered and then examine the effect on the target symptoms. For example, the causal role of worry and reasoning biases in paranoia has been demonstrated, and interventions targeting these processes show promise (Freeman, Dunn et al. 2015, Garety, Waller et al. 2015). This study will therefore employ a causal interventionist approach to investigating the potential causal role of autobiographical episodic memory in negative symptoms. The current evidence base includes two intervention studies. The first targeted the specificity of episodic memory in people with psychosis and was conducted in a group format; participants (n = 24) were encouraged to keep diaries with specific daily memories and their associated emotions, this was then extended to more historical memories from childhood, adolescence and adulthood. The intervention improved memory specificity but there was no subsequent improvement in symptoms, although they were assessed using older measures and the group was not selected for negative symptoms (Ricarte, Hernández-Viadel et al. 2012). Another study targeted the potential causal link between over-general memory and negative emotions about future events in 32 participants with schizophrenia-spectrum diagnoses. The results showed that recalling a memory in response to event-related cues such as "birthday" or "argument" before completing a prospective task enhances positive mood when anticipating the future activity (Painter and Kring 2016).

The evidence reviewed so far suggests that impairments in episodic memory may contribute to negative symptoms and/or depression in people with schizophrenia. However, findings are somewhat equivocal which may be attributable to the limitations of negative symptoms and episodic memory measures, and small sample sizes. Robust investigation of the potential causal mechanism of episodic memory impairments in negative symptoms is important because they are a potential treatment target in an area with very few evidence-based interventions and a large unmet need. The outcomes to be investigated in this intervention study will be positive affect, negative affect, motivation and anticipatory pleasure as these have been identified as important components of negative symptoms and used in similar previous studies (Sanchez, Lavaysse et al. 2014, Edwards, Cella et al. 2015, Painter and Kring 2016). A measure of self-efficacy will be added as a novel outcome measure as this has recently been highlighted as a potential causal mechanism in negative symptoms and poor functioning (Campellone, Sanchez et al. 2016).

2 Study Objectives and Design

2.1. Study Objectives

The overall aim of this study is to investigate the role of autobiographical episodic memory impairments in experiential negative symptoms and depression in people with schizophrenia.
First, cross sectional associations between these constructs will be examined using the currently available most valid measures of these constructs and including the measurement of possible confounders including cognition and self-efficacy.
Second, an intervention study will be conducted to further explore the potential causal mechanism of autobiographical episodic memory in negative symptoms. This will use a brief intervention targeting memory flexibility hypothesised to improve pleasure and motivation outcomes.

2.2 Study Design

A single sample of participants will be recruited for the two parts of the study. Part 1 will have a cross-sectional design with the aim of examining hypothesised relationships between autobiographical memory and experiential negative symptoms. Part 2 will have an experimental design and the participants will be randomized to either the intervention or control condition with a randomization ratio of 2:1.

3. Sample Size, Statistics, Selection and Withdrawal of Subjects

People with a diagnosis of non-affective psychosis aged 18 - 65yrs will be recruited from local community mental health teams and inpatient wards within South London and Maudsley NHS Trust. Further eligibility criteria for the study are a score of at least 18 on the experiential subscale of the Clinical Assessment Interview for Negative Symptoms to ensure at least a moderate level of current negative symptomatology.
A power analysis conducted in GPower Software (version 3.2) with power at 0.8 and $\alpha = 0.05$ found a sample size of 32 would be sufficient to replicate a correlation with a medium effect size of 0.43 between memory specificity and negative symptoms reported by Harrison and Fowler (2004). To account for drop-outs a sample size of 35-40 will be recruited, if there are few drop-outs this will also increase the power of the study. This sample size with a randomisation ratio of 2:1 is sufficient to detect an F statistic of 0.43 with power at 0.8 and 0.53 with power at 0.9.

There will be three recruitment routes in the study;

1. If recruited through a clinical team then the participant will first be approached by a member of their care team to introduce the study. If they indicate that they are happy to consider the project and give verbal consent for the researcher to contact them then they will be provided with the information sheet. The researcher will then contact them again after at least 24 hours to discuss their potential participation.
2. If recruited through CRIS then potential participants will first be approached by the researcher. This will be done by phone or letter, depending on the preference indicated by the potential participant.
3. If recruited through a recruitment poster then the participant will contact the researcher using the details provided on the poster.

4. Study procedures

Burden
The burden placed on participants has been minimised as much as possible by carefully considering the inclusion of each measure in the cross-sectional study and reducing the number of memories recalled in the cross-sectional and intervention parts of the study. Furthermore, the sessions can be split into several shorter sessions should this ease the burden on the participant. Breaks will be offered at regular intervals in each testing session and the researcher will monitor the participant carefully to ensure they are not experiencing a large burden during the study.

Risk of Distress
Both Part 1 and Part 2 of the study have been designed to minimise the chance of the participant experiencing distress during the study. Recalling memories can be distressing and thus the focus of this study, in line with the literature, is on positive memories with the participant only asked to recall one negative memory and three positive memories over the course of the study.
Should the participant become distressed at any point then the study will be terminated and the researcher will discuss this with them. The supervisors of this project have extensive clinical experience in this group and will be available for consultation should this situation arise. In addition, the researcher has experience working with this group of people and will manage the situation should it arise with the support of the supervisors. Any clinically relevant events will be discussed with the individuals' care team with the participant's permission to enable them to follow up on this at a later date.

Recruitment
People with a diagnosis of non-affective psychosis aged 18 - 65yrs will be recruited from local community mental health teams and inpatient wards within South London and Maudsley NHS Trust. Further eligibility criteria for the study are a score of at least 18 on the experiential subscale of the Clinical Assessment Interview for Negative Symptoms to ensure at least a moderate level of current negative symptomatology. These individuals will be identified by clinicians in their care team who will introduce the study to them and ask if they are happy for the researcher to contact them. They will be provided with the written information sheets and the opportunity to discuss with others and consider the information for at least 24 hours. The researcher will then get in touch to discuss they would like to take part. Informed consent will then be obtained from all the participants.

Measures
Part 1 Cross-sectional Study

Autobiographical Memory Specificity Task (Painter & Kring, 2016)

This task will be used in the cross-sectional study (part 1) and then adapted for use in the intervention study (part 2).

Participants will be asked to generate a narrative for an event that occurred in the past at a specific time and place and did not last longer than one day. They will be asked to do this for 2 separate events, one positive and one negative. The participants will complete one practice trial where they will be asked to generate a narrative for a time when “they listened to music or the radio”. The participant will be given feedback on this practice trial (e.g. “Exactly, now do the same for the rest of the narratives”, or “Good, but for the rest of the task please tell me about an event that occurred at a specific time or place”) and

then begin the memory task. For each cue the participant will be prompted as follows: “Picture a specific time in the past when a [positive or negative] event occurred. Tell me about it in as much detail as possible, as if you were telling a story.”

The participants will then complete a questionnaire relating to the memory to assess how detailed they found the experience and how positive/negative they found the memory to be.

Two independent coders will rate the emotional valence, temporal referencing (references to the past/future) and flexibility (specificity and generalisability) of the narratives produced.

Verbal Fluency Test (Lezak 2012)
This will be used as a brief assessment of verbal fluency which may be a potential confounder for memory recall.

Letter-Number Sequencing (Wechsler, 2011)
This will be used as a brief assessment of working memory which again may be a potential confounder for memory recall.

Clinical Assessment Interview for Negative Symptoms (CAINS) (Horan, Kring et al. 2011)
This is an interviewer-administered assessment for negative symptoms in schizophrenia. Each item is scored from 0 (no impairment) – 4 (severe deficit). There are nine items in the experiential subscale including motivation, recent consummatory pleasure (last week) and anticipatory pleasure (next week) reported by the individual for social, recreational, work/school activities and relationships with family and friends. The expressive subscale includes four items assessing facial expressions, gestures, quantity and quality of speech.

Scale for the Assessment of Positive Symptoms (Andreasen 1984)
This 34-item scale will be used as a measure of the levels of positive symptomatology currently being experienced by the individual, each item is rated from 0 (absent) to 5 (severe). The items are grouped into four subscales assessing delusional beliefs, hallucinations, bizarre behaviour and thought disorder.

Time use Survey (Fowler, Hodgekins et al. 2009)
This is a measure of functioning which assesses how much time an individual spends in different activities including household chores, paid work, voluntary work, leisure activities, childcare, sport and hobbies. The number of hours spent in each of these domains is summarized as Constructive Economic Activity (CEA) and Structured Activity (SA).

Beck Depression Inventory (BDI-II) (Beck, Steer et al. 1996)
This 21-item self-report scale, rated on a 4-point scale from 0 – 3 (total score ranges from 0 to 63, >13 indicates a clinically-relevant level of depression) will be used to assess the levels of depressive symptoms currently experienced by the individual.

Dysfunctional Attitudes Scale (Weissman and Beck 1978)
This 40-item scale will be included as an assessment of self-defeatist beliefs. Each item consists of a statement and a 7-point Likert scale (1 = fully disagree, 7 = fully agree). The total score ranges from 40-280 and the higher the score the more dysfunctional attitudes that person has endorsed.

Part 2 Experimental Study

Outcomes
The participants will be asked to rate the following items before and after their participation in either the intervention or control condition. These are rated on 100-point visual analogue scales from 1 “Not at All” to 10 “Very Much So”. These are similar to those used in experience sampling studies where these repeated measures have been shown to be reliable and valid (Gard, Kring et al. 2007, Oorschot, Lataster et al. 2011, Gard, Sanchez et al. 2014).

1) Right now I feel [enthusiastic, satisfied, relaxed, cheerful]

2) Right now I feel [down, guilty, anxious, annoyed]

3) How likely the event is to happen again.

4) How able they would feel to engage in the future event.

5) How enjoyable the future event would be.

Intervention
This is based on the memory task described previously, which will enable the specificity, affect and temporal references in the narratives generated during the intervention to be compared to those generated in the baseline task.

Intervention Condition
In contrast to the baseline task participants will be asked to generate narratives for positive events they think may happen again in the future.
The autobiographical memory task described previously will also be adapted to include the following intervention components:

1) An animated video with people explaining how they find memory helpful in deciding what they do and don’t want to do in the future, and how this is motivating.

2) Cues provided during the generation of the narrative as follows:

    a. Why did you choose this activity? Did this activity give you a sense of achievement? How enjoyable was it?

    b. Where is it/ When is it/Who is there?

    c. Sight/Hear/Smell/Sound/Taste.

3) A reminder of the link between memory and anticipation

    a. Would you do this activity again? Why/why not?

4) A reminder of the links between this memory/event and others.

    a. Can you link this to other events?

    b. What does this memory tell us about you as a person?

Control Condition
Participants will complete the same task as above but without any of the intervention prompts. They will also be asked to generate a narrative for two positive events that they think may happen again in the future.

Feedback Questionnaire
Participants will be asked to complete a brief feedback questionnaire regarding their experience of the intervention and what elements of it were helpful. The questionnaire will include a free text box for participants to provide general feedback on their experience.

Procedure
Part 1: Participants will complete the baseline autobiographical memory task which involves recalling 1 positive and 1 negative event which will be audio-recorded and coded by two independent raters. Then participants will complete the two subtests of the Wecshler Abbreviated Intelligence Scale - verbal fluency and letter-number sequencing which assess working memory. Two questionnaires that assess depression symptoms and negative thinking (Beck Depression Inventory and Dysfunctional Attitudes Scale) will then be completed by the participant. Finally, three interviews assessing symptoms and functioning will be conducted by the researcher (CAINS, Time Use Survey and Scale for the Assessment of Positive Symptoms (SAPS). This session should last approximately 1.5-2hrs.

Part 2: After Part 1 the participants will be randomized to the intervention or control group using a 2:1 ratio and the "sealed envelope" online software. This will be done by the Chief Investigator who will record the randomisation process and outcome. At the start of the Part 2 session the participants will be asked to select a positive event to describe. They will then complete the visual analogue scales assessing positive and negative feelings, motivation, anticipatory pleasure and self-efficacy. The participants will then complete either the intervention or control task before repeating the visual analogue scales again. The intervention and control task both involve describing this positive event; the control task with no prompts and the intervention task with prompts and videos encouraging them to include more detail in their recall and to link it to past and future events as well. Participants will do this process for two positive events and this session should last approximately 1 hr. Participants will be asked to complete a brief feedback questionnaire at the end of their participation in the study.

This concludes the participant's involvement in the research.

End of Study Definition
The study is completed once all the data has been analysed and submitted for publication.

5. Ethics & Regulatory Approvals

REC Name and Address:

This study also requires approval from the Psychosis Clinical Academic Group (CAG) within Kings Health Partners and this has been granted (Ref: PSYR&D16/22).

6. Data Handling

Access to Medical Records

In order to confirm the diagnosis given to the participants and to record their participation in the study for their care team the researcher will need to access the patient's electronic medical records through the electronic Patient Journey System within SLaM.

Personal Data
Information such as names, addresses and telephone numbers will be needed to contact participants both to arrange appointments and to contact them in the future should any relevant information arise. It will be stored separately from the anonymised data and it will not be possible to link this data to that which is collected during the study.

Audio/Visual Recording
Participants will be audio-recorded during their memory recall, they will be asked to sign a separate consent form for this recording. The recording will be done on a dictaphone and the researcher will ensure no identifiable information beyond the memories themselves is recorded. This dictaphone will be stored in a locked filing cabinet at Kings College London.

Manual Files
All data will be collected using paper questionnaires and interviews - these will be identified using participant codes only and will not contain any identifiable information.

University Computers
All data will be entered onto Kings College London computers and password-protected.

Data Storage
All data will be stored for five years after the completion of the study in locked offices at Kings College London which are also protected by 24hr security.

Compliance
The CI will ensure that the trial is conducted in compliance with the principles of the Declaration of Helsinki (1996), and in accordance with all applicable regulatory requirements including but not limited to the Research Governance Framework, Trust and Research Office policies and procedures and any subsequent amendments.

7. Finance and Publication Policy

This study is conducted for part-fulfilment of the Doctorate in Clinical Psychology thesis – it will receive £1000 funding from the course for this purpose.

The data from this study will be published in the thesis and will also be written up for publication in peer-reviewed journals.

References

Andreasen (1984). "Scale for the assessment of negative symptoms." Iowa City: University of Iowa.

Andreasen (1984). "The Scale for the Assessment of Positive Symptoms (SAPS)." University of Iowa, Iowa, IA.

Beck, et al. (1996). "Manual for the Beck Depression Inventory-II." Psychological Corporation.

Berna, F., et al. (2016). "A Meta-Analysis of Autobiographical Memory Studies in Schizophrenia Spectrum Disorder." Schizophr Bull **42**(1): 56-66.

Meta-analyses and reviews on cognitive disorders in schizophrenia have shown that the most robust and common cognitive deficits are found in episodic memory and executive functions. More complex memory domains, such as autobiographical memory (AM), are also impaired in schizophrenia, but such impairments are reported less often despite their negative impact on patients' outcome. In contrast to episodic memory, assessed in laboratory tasks, memories of past personal events are much more complex and directly relate to the self. The meta-analysis included 20 studies, 571 patients with schizophrenia spectrum disorder, and 503 comparison subjects. It found moderate-to-large effect sizes with regard to the 3 parameters commonly used to assess AM: memory specificity (g = -0.97), richness of detail (g = -1.40), and conscious recollection (g = -0.62). These effect sizes were in the same range as those found in other memory domains in schizophrenia; for this reason, we propose that defective memories of personal past events should be regarded as a major cognitive impairment in this illness.

Blanchard, J. J., et al. (2001). "Diagnostic differences in social anhedonia: a longitudinal study of schizophrenia and major depressive disorder." J Abnorm Psychol. **110**(3): 363-371.

This study examined the hypothesis that, in schizophrenia, elevated trait social anhedonia (SA) is a stable individual difference, whereas in depression, increased SA is a reflection of a current clinical state that will diminish with recovery. Differences in trait Negative Affect (NA) and Positive Affect (PA) were also examined. Individuals with schizophrenia (n = 55) and depression (n = 34) were evaluated at baseline during hospitalization and compared with nonpsychiatric control participants (n = 41). Participants were assessed again at a 1-year follow-up. At baseline, compared with control participants, individuals with schizophrenia and depression were both characterized by elevated SA, greater NA, and lower PA. In schizophrenic individuals, elevated SA remained stable over the follow-up. However, in recovered depressed patients, SA declined over the follow-up period. Group differences remained in NA and PA over the 1-year follow-up. These results support the view that elevated SA is enduring in schizophrenia but that elevated SA is transiently related to clinical status in depression.

Campellone, T. R., et al. (2016). "Defeatist Performance Beliefs, Negative Symptoms, and Functional Outcome in Schizophrenia: A Meta-analytic Review." Schizophrenia Bulletin.

Negative symptoms are a strong predictor of poor functional outcome in people with schizophrenia. Unfortunately there are few effective interventions for either negative symptoms or functional outcome, despite the identification of potential mechanisms. Recent research, however, has elucidated a new potential mechanism for negative symptoms and poor functional outcome: defeatist performance beliefs (DPB), or negative thoughts about one's ability to successfully perform goal-directed behavior that can prevent behavior initiation and engagement. We conducted 2 meta-analyses examining the relationship between DPB and both negative symptoms (n = 10 studies) and functional outcome (n = 8 studies) in people with schizophrenia. We found a small effect size for the relationship between DPB and negative symptoms, regardless of how negative symptoms were measured. We also found a small effect size for the relationship between DPB and functional outcome, which was significantly moderated by the method of assessing DPB and moderated by the sex composition of the study at a trend level. These findings highlight the potential of targeting DPB in psychosocial interventions for both negative symptoms and functional outcome.

Conway, M. A. and C. W. Pleydell-Pearce (2000). "The construction of autobiographical memories in the self-memory system." Psychological Review **107**(2): 261-288.

The authors describe a model of autobiographical memory in which memories are transitory mental constructions within a self-memory system (SMS). The SMS contains an autobiographical knowledge base and current goals of the working self. Within the SMS, control processes modulate access to the knowledge base by successively shaping cues used to activate autobiographical memory knowledge structures and, in this way, form specific memories. The relation of the knowledge base to active goals is reciprocal, and the knowledge base "grounds" the goals of the working self. It is shown how this model can be used to draw together a wide range of diverse data from cognitive, social, developmental, personality, clinical, and neuropsychological autobiographical memory research. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Edwards, C. J., et al. (2015). "Investigating the empirical support for therapeutic targets proposed by the temporal experience of pleasure model in schizophrenia: A systematic review." Schizophrenia Research **168**(1): 120-144.

Fervaha, G., et al. (2013). "Amotivation and functional outcomes in early schizophrenia." Psychiatry Res **210**(2): 665-668.

Negative symptoms, particularly amotivation/apathy, are intimately tied to functional outcomes. In the present study, apathy strongly predicted psychosocial functioning in a sample of early course schizophrenia patients. This relationship remained robust even after controlling for other clinical variables. These data suggest amotivation is core to functioning across the disease course.

Fowler, D., et al. (2009). "Cognitive behaviour therapy for improving social recovery in psychosis: a report from the ISREP MRC Trial Platform study (Improving Social Recovery in Early Psychosis)." Psychological Medicine **39**(10): 1627-1636.

Freeman, D. (2011). "Improving cognitive treatments for delusions." Schizophr Res **132**(2-3): 135-139.

A clear challenge for schizophrenia research is to improve markedly the efficacy of psychological treatments for delusional beliefs. Effect sizes for the first generation of cognitive approaches are weak to moderate. These therapies now lag behind the transformation over the past ten years in understanding the causes of delusions. This paper advocates an interventionist-causal model approach: to focus on one putative causal factor at a time, show that an intervention can change it, and examine the subsequent effects on the delusional beliefs. A number of new studies that illustrate this approach with patients with schizophrenia spectrum disorders who have not responded to previous treatment are reviewed. These early stage studies show great promise in terms of efficacy, although remain to be subjected to methodologically rigorous evaluation. The advantages and difficulties of the interventionist approach applied to psychosis are considered, and future studies are highlighted. The importance for clinical services of cognitive approaches to psychosis will increase further if the theoretical advances can be translated into treatment.

Freeman, D., et al. (2015). "Effects of cognitive behaviour therapy for worry on persecutory delusions in patients with psychosis (WIT): a parallel, single-blind, randomised controlled trial with a mediation analysis." The Lancet Psychiatry **2**(4): 305-313.

Gard, D. E., et al. (2007). "Anhedonia in schizophrenia: distinctions between anticipatory and consummatory pleasure." Schizophrenia Research **93**(1-3): 253-260. Epub 2007 May 2009.

Research on anhedonia in schizophrenia has revealed mixed results, with patients reporting greater anhedonia than healthy controls on self-report measures and semi-structured interviews, but also reporting comparable experiences of positive emotions in response to pleasurable stimuli. Basic science points to the importance of distinguishing between anticipatory and consummatory (or in-the-moment) pleasure experiences, and this distinction may help to reconcile the mixed findings on anhedonia in schizophrenia. In two studies, we tested the hypothesis that anhedonia in schizophrenia reflects a deficit in anticipatory pleasure but not consummatory pleasure. In Study 1, we used experience sampling methodology to assess reported experiences of consummatory and anticipated pleasure among schizophrenia patients and controls. In Study 2, schizophrenia patients and controls completed a self-report trait measure of anticipatory and consummatory pleasure and interviews that assessed negative symptoms, including anhedonia, and community functioning. In both studies, we found evidence for an anticipatory but not a consummatory pleasure deficit in schizophrenia. In addition, anticipatory pleasure was related to clinical ratings of anhedonia and functional outcome. Clinical and research implications of these findings are discussed.

Gard, D. E., et al. (2014). "Do people with schizophrenia have difficulty anticipating pleasure, engaging in effortful behavior, or both?" Journal of Abnormal Psychology **123**(4): 771-782.

Motivation deficits are common in schizophrenia, but little is known about underlying mechanisms, or the specific goals that people with schizophrenia set in daily life. Using neurobiological heuristics of pleasure anticipation and effort assessment, we examined the quality of activities and goals of 47 people with and 41 people without schizophrenia, utilizing ecological momentary assessment. Participants were provided cell phones and called 4 times a day for 7 days, and were asked about their current activities and anticipation of upcoming goals. Activities and goals were later coded by independent raters on pleasure and effort. In line with recent laboratory findings on effort computation deficits in schizophrenia, relative to healthy participants, people with schizophrenia reported engaging in less effortful activities and setting less effortful goals, which were related to patient functioning. In addition, patients showed some inaccuracy in estimating how difficult an effortful goal would be, which in turn was associated with lower neurocognition. In contrast to previous research, people with schizophrenia engaged in activities and set goals that were more pleasure-based, and anticipated goals as being more pleasurable than controls. Thus, this study provided evidence for difficulty with effortful behavior and not anticipation of pleasure. These findings may have psychosocial treatment implications, focusing on effort assessment or effort expenditure. For example, to help people with schizophrenia engage in more meaningful goal pursuits, treatment providers may leverage low-effort pleasurable goals by helping patients to break down larger, more complex goals into smaller, lower-effort steps that are associated with specific pleasurable rewards. (PsycINFO Database Record (c) 2014 APA, all rights reserved).

Garety, P., et al. (2015). "Cognitive mechanisms of change in delusions: an experimental investigation targeting reasoning to effect change in paranoia." Schizophr Bull **41**(2): 400-410.

BACKGROUND: Given the evidence that reasoning biases contribute to delusional persistence and change, several research groups have made systematic efforts to modify them. The current experiment tested the hypothesis that targeting reasoning biases would result in change in delusions. METHODS: One hundred and one participants with current delusions and schizophrenia spectrum psychosis were randomly allocated to a brief computerized reasoning training intervention or to a control condition involving computer-based activities of similar duration. The primary hypotheses tested were that the reasoning training intervention, would improve (1) data gathering and belief flexibility and (2) delusional thinking, specifically paranoia. We then tested whether the changes in paranoia were mediated by changes in data gathering and flexibility, and whether working memory and negative symptoms moderated any intervention effects. RESULTS: On an intention-to-treat analysis, there were significant improvements in state paranoia and reasoning in the experimental compared with the control condition. There was evidence that changes in reasoning mediated changes in paranoia, although this effect fell just outside the conventional level of significance after adjustment for baseline confounders. Working memory and negative symptoms significantly moderated the effects of the intervention on reasoning. CONCLUSION: The study demonstrated the effectiveness of a brief reasoning intervention in improving both reasoning processes and paranoia. It thereby provides proof-of-concept evidence that reasoning is a promising intermediary target in interventions to ameliorate delusions, and thus supports the value of developing this approach as a longer therapeutic intervention.

Harrison, C. L. and D. Fowler (2004). "Negative symptoms, trauma, and autobiographical memory: an investigation of individuals recovering from psychosis." J Nerv Ment Dis **192**(11): 745-753.

Psychological research on negative symptoms in schizophrenia is scarce. The aim of this study was to explore the relationship between negative symptoms and trauma in individuals recovering from a psychotic illness. Specifically, the aim was to examine the association between negative symptoms and traumatic reactions to psychosis and to hospitalization. We were also interested in the association between traumatic reactions and autobiographical memory. The design was a cross-sectional investigation of 38 people recovering from functional psychotic illness. Hypotheses were examined using correlations between measures of negative symptoms, posttraumatic avoidance, and specificity of autobiographical retrieval. Negative symptoms were found to be significantly associated with avoidance of traumatic memories related to psychosis and hospitalization and with a lack of specificity in autobiographical recall. Further analysis showed that avoidance related to psychosis and low specificity in recall were significant predictors of negative symptoms. These data suggest that people who avoid traumatic memories of psychosis and hospitalization have more negative symptoms and retrieve fewer specific autobiographical memories. The possibility that negative symptoms may be reactive is explored, along with the implications for our theoretical and clinical understanding. The methodological limitations of the study and ideas for future research are discussed.

Hitchcock, C., et al. (2016). "The effects of autobiographical memory flexibility (MemFlex) training: An uncontrolled trial in individuals in remission from depression." J Behav Ther Exp Psychiatry **52**: 92-98.

BACKGROUND AND OBJECTIVES: Impaired cognitive processing is a key feature of depression. Biases in autobiographical memory retrieval (in favour of negative and over-general memories) directly impact depression symptoms, but also influence downstream cognitive factors implicated in the onset and maintenance of the disorder. We introduce a novel cognitive intervention, MemFlex, which aims to correct these biases in memory retrieval and thereby modify key downstream cognitive risk and maintenance factors: rumination, impaired problem solving, and cognitive avoidance. METHOD: Thirty eight adults with remitted Major Depressive Disorder completed MemFlex in an uncontrolled clinical trial. This involved an orientation session, followed by self-guided completion of six workbook-based sessions over one-month. Assessments of cognitive performance and depression symptoms were completed at pre- and post-intervention. RESULTS: Results demonstrated medium-sized effects of MemFlex in improving memory specificity and problem solving, and decreasing rumination, and a small effect in reducing cognitive avoidance. No significant change was observed in residual symptoms of depression. LIMITATIONS: This study was an uncontrolled trial, and has provided initial evidence to support a larger-scale, randomized controlled trial. CONCLUSIONS: These findings provide promising evidence for MemFlex as a cost-effective, low-intensity option for reducing cognitive risk associated with depression.

Horan, W. P., et al. (2011). "Development and psychometric validation of the Clinical Assessment Interview for Negative Symptoms (CAINS)." Schizophr Res. **132**(2-3): 140-145. doi: 110.1016/j.schres.2011.1006.1030. Epub 2011 Jul 1027.

Progress in the development of new pharmacological and psychosocial treatments for the negative symptoms of schizophrenia is impeded by limitations of available assessment instruments. The multi-site Collaboration to Advance Negative Symptom Assessment in Schizophrenia (CANSAS) was established to develop and validate a new clinical rating scale using

a transparent, iterative, and data-driven process. The Clinical Assessment Interview for Negative Symptoms (CAINS) was designed to address limitations of existing measures and assess consensus-based sub-domains, including asociality, avolition, anhedonia, affective blunting, and alogia. The structure and psychometric properties of the CAINS were evaluated in a sample of 281 schizophrenia and schizoaffective outpatients at four sites. Converging structural analyses indicated that the scale was comprised of two moderately correlated factors - one reflecting experiential impairments (diminished motivation and enjoyment of social, vocational, and recreational activities) and one reflecting expressive impairments (diminished non-verbal and verbal communication). Item-level analyses revealed generally good distributional properties, inter-rater agreement, discriminating anchor points, and preliminary convergent and discriminant validity. Results indicate that the CAINS is a promising new measure for quantifying negative symptoms in clinical neuroscience and treatment studies. Results guided item modification or deletion, and the reliability and validity of the revised, shorter version of the CAINS is in the final phase of development within the CANSAS project.

Kay, S. R., et al. (1987). "The positive and negative syndrome scale (PANSS) for schizophrenia." Schizophr Bull **13**(2): 261-276.

The variable results of positive-negative research with schizophrenics underscore the importance of well-characterized, standardized measurement techniques. We report on the development and initial standardization of the Positive and Negative Syndrome Scale (PANSS) for typological and dimensional assessment. Based on two established psychiatric rating systems, the 30-item PANSS was conceived as an operationalized, drug-sensitive instrument that provides balanced representation of positive and negative symptoms and gauges their relationship to one another and to global psychopathology. It thus constitutes four scales measuring positive and negative syndromes, their differential, and general severity of illness. Study of 101 schizophrenics found the four scales to be normally distributed and supported their reliability and stability. Positive and negative scores were inversely correlated once their common association with general psychopathology was extracted, suggesting that they represent mutually exclusive constructs. Review of five studies involving the PANSS provided evidence of its criterion-related validity with antecedent, genealogical, and concurrent measures, its predictive validity, its drug sensitivity, and its utility for both typological and dimensional assessment.

Kirkpatrick, B., et al. (2006). "The NIMH-MATRICS consensus statement on negative symptoms." Schizophrenia Bulletin **32**(2): 214-219. Epub 2006 Feb 2015.

Kollias, C. T., et al. (2008). "Association of physical and social anhedonia with depression in the acute phase of schizophrenia." Psychopathology **41**(6): 365-370. Epub 2008 Sep 2003.

BACKGROUND/AIMS: Researchers have shown interest in the association between anhedonia and depression in schizophrenia. The aim of the current study was to investigate the relationship between physical and social anhedonia with depression in a sample of inpatients with schizophrenia in the acute phase of their illness. METHODS: Sixty-two patients with acute schizophrenia consecutively admitted at the Eginition Hospital, Department of Psychiatry, University of Athens were assessed using the revised Physical Anhedonia Scale, the revised

Social Anhedonia Scale and the Calgary Depression Scale for Schizophrenia. RESULTS: The Calgary Depression Scale for Schizophrenia score correlated with both physical anhedonia and social anhedonia ratings. The revised Social Anhedonia Scale score significantly correlated to self-depreciation, guilty ideas of reference, pathological guilt, early wakening, suicidality and observed depression. The revised Physical Anhedonia Scale score significantly correlated with depressive mood, self-depreciation, pathological guilt and observed depression. Self-depreciation, pathological guilt and observed depression were correlated with both social and physical anhedonia. CONCLUSION: Depression in schizophrenia and anhedonia may overlap, and it could therefore be difficult to clinically differentiate them, especially in acute schizophrenia patients.

Kring and D. M. Barch (2014). "The motivation and pleasure dimension of negative symptoms: Neural substrates and behavioral outputs." European Neuropsychopharmacology **24**(5): 725-736.

Kring and Caponigro (2010). "Emotion in Schizophrenia Where Feeling Meets Thinking." Current Directions in Psychological Science **19**(4): 255-259.

Lezak, M. D., Howieson, D.B., Bigler, E.D., Tranel, D. (2012). Neuropsychological Assessment Oxford University Press.

Marchesi, C., et al. (2015). "Decrease of functioning in remitted and non-remitted patients 16 years after a first-episode schizophrenia." J Nerv Ment Dis **203**(6): 406-411.

In schizophrenia, a better level of functioning has been generally associated with symptomatic remission. However, this association has been supported by cross-sectional studies or by studies with a short follow-up period. Forty-eight patients with schizophrenia were evaluated by the Positive and Negative Symptoms Scale and the Social and Occupational Functioning Assessment Scale (SOFAS) at the first episode and after a mean period of 16 years. At follow-up, patients were defined as remitters (R) or non-remitters (NR) according to the Remission Schizophrenia Working Group criteria. R (n = 18; 37.5%) compared to NR showed at the first episode a lower illness severity and a better level of functioning. A functional decline was found in both groups at follow-up, even though NR showed a more than twofold reduction than R. Better SOFAS scores at follow-up were predicted by baseline SOFAS score and less severe negative symptoms at follow-up. Schizophrenia implies a functional decline over time, regardless of the symptomatic remission status with negative symptoms playing a major role.

Menendez-Miranda, I., et al. (2015). "Predictive factors of functional capacity and real-world functioning in patients with schizophrenia." Eur Psychiatry **30**(5): 622-627.

PURPOSE: This study was performed to identify the predictive factors of functional capacity assessed by the Spanish University of California Performance Skills Assessment (Sp-UPSA) and real-world functioning assessed by the Spanish Personal and Social Performance scale (PSP) in outpatients with schizophrenia. METHODS: Naturalistic, 6-month follow-up, multicentre, validation study. Here, we report data on 139 patients with schizophrenia at their baseline visit. ASSESSMENT: Positive and Negative Syndrome Scale (PANSS), Clinical Global Impression-

Severity (CGI-S), Sp-UPSA and PSP. STATISTICS: Pearson's correlation coefficient (r) was used to determine the relationships between variables, and multivariable stepwise linear regression analyses to identify predictive variables of Sp-UPSA and PSP total scores. RESULTS: Functional capacity: scores on the PSP and PANSS-GP entered first and second at P<0.0001 and accounted for 21% of variance (R(2)=0.208, model df=2, F=15.724, P<0.0001). Real-world functioning: scores on the CGI-S (B=-5.406), PANSS-N (B=-0.657) and Sp-UPSA (B=0.230) entered first, second and third, and accounted for 51% of variance (model df=3, F=37.741, P<0.0001). CONCLUSION: In patients with schizophrenia, functional capacity and real-world functioning are two related but different constructs. Each one predicts the other along with other factors; general psychopathology for functional capacity, and severity of the illness and negative symptoms for real-world functioning. These findings have important clinical implications: (1) both types of functioning should be assessed in patients with schizophrenia and (2) strategies for improving them should be different.

Messinger, J. W., et al. (2011). "Avolition and expressive deficits capture negative symptom phenomenology: implications for DSM-5 and schizophrenia research." Clin Psychol Rev **31**(1): 161-168.

The DSM-5 formulation presents an opportunity to refine the negative symptom assessments that are crucial for a schizophrenia diagnosis. This review traces the history of negative symptom constructs in neuropsychiatry from their earliest conceptualizations in the 19th century. It presents the relevant literature for distinguishing between different types of negative symptoms. Although a National Institute of Mental Health consensus initiative proposed that there are five separate negative symptom domains, our review of the individual items demonstrates no more than three negative symptom domains. Indeed, numerous factor analyses of separate negative symptom scales routinely identify only two domains: 1) expressive deficits, which include affective, linguistic and paralinguistic expressions, and 2) avolition for daily life and social activities. We propose that a focus on expressive deficits and avolition will be of optimum utility for diagnosis, treatment-considerations, and research purposes compared to other negative symptom constructs. We recommend that these two domains should be assessed as separate dimensions in the DSM-5 criteria.

Oorschot, M., et al. (2011). "Emotional Experience in Negative Symptoms of Schizophrenia--No Evidence for a Generalized Hedonic Deficit." Schizophrenia Bulletin **20**: 20.

Background: Deficits in emotion processing are thought to underlie the key negative symptoms flat affect and anhedonia observed in psychotic disorders. This study investigated emotional experience and social behavior in the realm of daily life in a sample of patients with schizophrenia and schizoaffective disorder, stratified by level of negative symptoms. Methods: Emotional experience and behavior of 149 patients with schizophrenia and schizoaffective disorder and 143 controls were explored using the Experience Sampling Method. Results: Patients reported lower levels of positive and higher levels of negative affect compared with controls. High negative symptom patients reported similar emotional stability and capacity to generate positive affect as controls, whereas low negative symptom patients reported increased instability. All participants displayed roughly comparable emotional responses to the company of other people. However, in comparison with controls, patients showed more social withdrawal and preference to be alone while in company, particularly the high negative symptom group. Conclusions: This study revealed no evidence for a generalized hedonic deficit in patients with

psychotic spectrum disorders. Lower rather than higher levels of negative symptoms were associated with a pattern of emotional processing which was different from healthy controls.

Painter, J. M. and A. M. Kring (2016). "Toward an understanding of anticipatory pleasure deficits in schizophrenia: Memory, prospection, and emotion experience." Journal of Abnormal Psychology **125**(3): 442-452.

Anticipatory pleasure deficits have been observed in people with schizophrenia. Less is known about the extent to which interrelated processes that comprise anticipatory pleasure, including memory, prospection, and emotion experience are disrupted. We asked people with (n = 32) and without (n = 29) schizophrenia or schizoaffective disorder to provide memory and prospection narratives in response to specific cues. Half of the prospections followed a memory task, and half followed a control task. People with schizophrenia generated memories similar in content and experience as controls even as they described them less clearly. However, people with schizophrenia were less likely to explicitly reference the past in their prospections, and their prospections were less detailed and richly experienced than controls, regardless of the task completed before prospection. People with schizophrenia reported similar levels of positive emotion (current and predicted) in positive prospections that followed the memory task, but less positive emotion than controls in positive prospections that followed the control task. Taken together, these results suggest that people with schizophrenia experience difficulties drawing from past experiences and generating detailed prospections. However, asking people with schizophrenia to recall and describe memories prior to prospection may increase the likelihood of drawing from the past in prospections, and may help boost current and predicted pleasure. (PsycINFO Database Record

Ricarte, J. J., et al. (2012). "Effects of event-specific memory training on autobiographical memory retrieval and depressive symptoms in schizophrenic patients." J Behav Ther Exp Psychiatry **43, Supplement 1**: S12-S20.

Ricarte, J. J., et al. (2014). "Rumination and autobiographical memory impairment in patients with schizophrenia." Schizophr Res **160**(1-3): 163-168.

Although patients with schizophrenia exhibit autobiographical memory impairment, which is considered to be a limiting factor in their daily life, the mechanisms underlying such impairment have been rarely studied. In the current study, we investigate whether rumination and, in particular, brooding, which is a form of maladaptive repetitive thinking, may be linked to the difficulty that patients with schizophrenia experience when attempting to access specific autobiographical memories. Our results indicate that patients reported less specific autobiographical memories compared to control participants. Patients also displayed a higher level of brooding and had more depressive symptoms. According to the CaR-FA-X model (Williams et al., 2007), depression and brooding were associated with memory specificity in control participants. In contrast, neither depression nor brooding was correlated with memory specificity in patients. These results suggest that depression and rumination may not be directly related to patients' difficulty to recall specific memories and that other factors, such as metacognitive deficits, must first be considered when seeking interventions aimed to improve autobiographical memory in patients with schizophrenia.

Robertson, B. R., et al. (2014). "Social competence versus negative symptoms as predictors of real world social functioning in schizophrenia." Schizophr Res **160**(1-3): 136-141.

Deficits in real world social functioning are common in people with schizophrenia and the treatment of social skills deficits has been a long-time treatment strategy. However, negative (i.e., deficit) symptoms also appear to contribute to real-world social dysfunction. In this study, we combined data from three separate studies of people with schizophrenia (total n=561) who were assessed with identical methods. We examined the prediction of real-world social functioning, rated by high contact clinicians, and compared the influence of negative symptoms and social skills measured with performance-based methods on these outcomes. Negative symptom severity accounted for 20% of the variance in real-world social functioning, with social skills adding an incremental 2%. This 2% variance contribution was the same when social skills were forced into a regression model prior to negative symptom severity. When we examined individual negative symptoms, prediction of real-world social functioning increased to 28%, with active and passive social avoidance entering the equation. Adding depression into the predictor model improved the prediction of real-world social functioning significantly, but minimally (4% variance). Social skills contribute to real-world social outcomes, but treating negative symptoms appears to be a possible path for improving real-world social functioning in this population.

Sanchez, A. H., et al. (2014). "Daily life evidence of environment-incongruent emotion in schizophrenia." Psychiatry Res **220**(1-2): 89-95.

Researchers have recently hypothesized that negative emotion in positive situations may be one mechanism for understanding emotion dysfunction in schizophrenia. Using ecological momentary assessment, we examined the relationship between emotion experience and environmental context in the daily lives of participants with and without schizophrenia. Participants with (n=47) and without schizophrenia (n=41) were provided a cellular telephone and called four times a day for one week. During each call participants rated their emotion experiences, described their current activities, and rated enjoyment from those activities. In line with previous research, participants with schizophrenia reported higher negative emotion overall relative to participants without schizophrenia, but equivalent levels of positive emotion and activity enjoyment. In line with the environment-incongruent negative emotion hypothesis, participants with schizophrenia evidenced a weaker relationship between reported enjoyment of current activities and current negative emotion compared to participants without schizophrenia. In addition, lower neurocognition predicted this weak relationship between negative emotion and context in the schizophrenia group. These findings provide ecologically valid support for environment-incongruent negative emotion in schizophrenia, and suggest that people with schizophrenia with more impaired neurocognition may have more difficulties regulating negative emotion.

Sterk, B., et al. (2013). "Priorities, satisfaction and treatment goals in psychosis patients: an online consumer's survey." Pharmacopsychiatry **46**(3): 88-93.

BACKGROUND: An insight into preferences, satisfaction and treatment goals of patients is important for reaching treatment alliance and may increase the success of initiated treatment. METHODS: Participants from the Netherlands,with at least one psychotic episode, were asked to

fill in an online questionnaire. Participants ranked their priorities in treatment content, stated whether they were satisfied on these items and ranked a list of treatment goals. RESULTS: 462 respondents ranked their treatment preferences regarding treatment content(mean age: 40.3 years; mean duration of illness: 13.5 years). Items ranked most important: "prompt assistance, preferably in own environment", "attention for medication", "appropriate attitude of the professional caregiver". More than 50 % rated "unsatisfied" or "very unsatisfied" for: "practical help in resocialization", "aid to acquire autonomy" and "help with physical health". 345 participants ranked treatment goals (mean age: 40.4 years; mean duration of illness: 13.7 years). Items ranked most important: "reducing apathy and lack of initiative", "reducing disturbing or unusual experiences", "reducing confusion and concentration problems". CONCLUSION: Psychiatric services should pay great attention to early outpatient intervention with supportive counseling and an appropriate attitude of the caregiver with attention for medication use. Improvement is warranted for practical assistance, help in regaining autonomy and help with physical health.

The Schizophrenia Commission (2012). Schizophrenia - The Abandoned Illness.

Tulving, E. (1972). "Episodic and semantic memory 1." Organization of Memory. London: Academic **381**(4).

Weissman, A. N. and A. T. Beck (1978). "Development and validation of the Dysfunctional Attitude Scale: A preliminary investigation."

Williams, J. M., et al. (2007). "Autobiographical Memory Specificity and Emotional Disorder." Psychol Bull **133**(1): 122-148.

The authors review research showing that when recalling autobiographical events, many emotionally disturbed patients summarize categories of events rather than retrieving a single episode. The mechanisms underlying such overgeneral memory are examined, with a focus on hierarchical search model of personal event retrieval. An elaboration of this model is proposed to account for overgeneral memory, focusing on how memory search can be affected by (a) capture and rumination processes, when mnemonic information used in retrieval activates ruminative thinking; (b) functional avoidance, when episodic material threatens to cause affective disturbance; and (c) impairment in executive capacity and control that limits an individual's ability to remain focused on retrieval in the face of distraction.

Williams, J. M. and K. Broadbent (1986). "Autobiographical memory in suicide attempters." Journal of Abnormal Psychology **95**(2): 144-149.