Cooperation within the therapeutic relationship improves metacognitive functioning: preliminary findings

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ABSTRACT

Both clinical observations and empirical data suggest that metacognitive functioning is a factor strongly associated with a good psychotherapeutic outcome. It has been suggested that some interpersonal social motivations (*i.e.,* attachment and cooperation) may be associated with different levels of metacognitive functioning also within the therapeutic relationship. The aim of this study was to explore the relationship between cooperation and metacognitive monitoring within 58 psychotherapy sessions from seven different patients. All patients were initially assessed through a detailed psychiatric interview. Patients' adult attachment styles were evaluated using the *Attachment Style Questionnaire.* The association between the activation of patients' interpersonal social motivations (*e.g.*, cooperation and attachment) and the modifications of metacognitive abilities during sessions was investigated using the *Assessing Interpersonal Motivations in Transcripts* method and the *Metacognition Assessment Scale* have been used. Our results showed that the activation of the patient's cooperative system is positively associated with an increase in metacognitive functioning, while the activation of attachment is not. The results of the present study have important implications for clinicians: they give empirical support for the role of cooperation in fostering metacognition within the therapeutic relationship.

Key words: cooperation; metacognition; interpersonal motivational systems; evolutionary psychotherapy.

Introduction

Metacognition is defined as the set of mental abilities that allow individuals to understand the mental states of themselves and others, working them out to tackle tasks and master mental states that are a source of subjective sufferance (Semerari *et al*., 2003). It has also been defined as *mindreading* or *mentalization* (Colle *et al*., 2020). Although each formulation introduces a slightly different perspective, each one retains the same core concept: mentalistic reasoning is crucial for social cognition and coordination (Bateman & Fonagy, 2004; Colle *et al*., 2020; Tomasello, 2020).

Both clinical observations and empirical data suggest that metacognitive functioning is a factor strongly associated with a good psychotherapeutic outcome (Dimaggio *et al*., 2009; Liotti,

2011). Improving metacognitive functioning is integral to the tasks of many therapeutic approaches and vital for psychological health (Fonagy *et al*., 2021; Talia *et al*., 2019).

Consistently with evolutionary research according to which metacognition developed to coordinate and communicate with others during activities that require the use of the skills and motivations characteristics of shared intentionality (Frith, 2012; Luyten *et al.*, 2020; Tomasello, 2020), some authors suggested that interpersonal social motivations (ISMs) such as attachment, ranking system or cooperation may be associated with different levels of metacognitive functioning also within the therapeutic relationship (Allen, Fonagy, & Bateman, 2008; Colle, *et al*., 2020; Fonagy, *et al*., 2021; Lee, Ahn, Kwon, & Kim, 2018). Indeed, relations between human beings, like other mammals, are governed by different inborn motivations that have evolved for achieving specific social goals and forming particular types of relationship, including care seeking-care giving (*i.e.*, attachment), competition for resources and forming social ranks (*i.e.*, dominance–submission) and alliance building and cooperation (Gilbert, 1989; Lichtenberg, 1989; Liotti, 2017; Liotti & Gilbert, 2011). According to most evolutionary theories (Fox, Muthukrishna, & Shultz, 2017; Tomasello, 2020), the human mind and its more sophisticated functions including language, joint attention, shared goals, teaching, consensus decision-making and empathy evolved to promote and stabilize cooperative social interactions. It has been also hypothesized that the optimal exercise of peer cooperation requires the activation of one's own and others' mind comprehension skills to achieve better coordination between them (Liotti & Gilbert, 2011). The cooperative system assumes a distinctive role in the field of psychotherapy, as the cooperative configuration within the therapeutic relationship is identified as one of the foremost predictors of psychotherapy's efficacy (Laska, Gurman, & Wampold, 2014) and is involved in the construction of the therapeutic alliance (Cortina & Liotti, 2014). Indeed, it has been proposed that when patient and therapist are attuned on a cooperative stance patient's metacognitive ability may improve, thus fostering the therapeutic alliance (Colle, *et al*., 2020; Liotti & Gilbert, 2011) and promoting a good psychotherapy outcome (Luyten, Campbell, Allison, *et al*., 2020; Wiltshire, Philipsen, Trasmundi, Jensen, & Steffensen, 2020).

Wiltshire and colleagues (2020), in their systematic review regarding the interpersonal coordination dynamics in psychotherapy, have highlighted the lack of studies investigating language-related phenomena and of multi-session studies, both of which are instead vital to improve our understanding of how different attitudes and interactional exchanges are related to psychotherapy effectiveness. Indeed, to the best of our knowledge, empirical studies demonstrating the relationship between cooperation and metacognition within psychotherapy sessions are scarce (Monticelli, Imperatori, Carcione, Pedone, & Farina, 2018). In light of what stated above, the aim of this study was to explore the relationship between cooperation and metacognitive monitoring within 58 psychotherapy sessions from seven different patients, using language-based validated analysis of session transcripts.

Methods

Participants

The enrollment lasted from January 2017 to July 2017. Study participants were recruited within a medical center in Rome (Italy) for the treatment of mental disorders. Inclusion criteria were both gender, age ≥18 years and Italian speaking. Exclusion criteria were a history of neurologic diseases and refusal to provide the informed consent for their participation in this study. During the enrollment stage, seven patients (five women and two men; mean age = 29.71±12.30 years; age range = 18-54 years) were recruited and a total of 58 individual psychotherapy sessions were considered.

The demographic and clinical data of the patients enrolled in the study are listed in Table 1.

All patients gave informed consent for their participation in this study. All data and transcripts were anonymized. No compensation was provided for completing the assessments. All procedures performed in this study were in accordance with the Helsinki declaration standards and its later amendments. The study was approved by the ethics review board of the European University (Prot. N.005/16).

Procedure

All patients received a complete psychiatric interview performed by a trained professional and were diagnosed according to the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013).

In order to explore the association between patient's ISMs and the modifications of their metacognitive abilities during the psychotherapeutic session, the *Assessing Interpersonal Motivations in Transcripts* (AIMIT) method (Liotti & Monticelli, 2008) and the *Metacognition Assessment Scale* (MAS) (Semerari, Carcione, Dimaggio, Falcone, Nicolò, *et al*., 2003) have been applied on the transcripts of all 58 psychotherapy sessions. To assess patients' attachment styles – a variable that could affect both their interpersonal styles and metacognition levels – we used the Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, 1994; Fossati *et al*., 2003).

The therapists (four women; mean age = 34.25±1.89 years; age range = 33-37 years) were a cognitive-behavioural oriented therapists with at least more than three years of professional ex-

Table 1. Demographic, clinical data of patients and descriptive statistics of the Assessing Interpersonal Motivations in Transcripts method, the Metacognition Assessment Scale and Attachment Style Questionnaire.

	Patient #1	Patient #2	Patient #3	Patient #4	Patient #5	Patient #6	Patient #7
Sex	F	M	F	M	F	F	F
Age	18	20	36	54	30	24	26
DSM-5 diagnosis	BPD	APD	BPD, DD-NOS	BD type I	MDD	BPD, MDD	BPD, APD
Number of sessions analysed	7	10	10	9	3	9	10

BPD, Borderline Personality Disorder; APD, Avoidant Personality Disorder; DD-NOS, Dissociative Disorder Not Otherwise Specified; BD, Bipolar Disorder; MDD, Major Depressive Disorder.

perience. Psychotherapy was performed with weekly sessions of about 50 minutes each. Only individual psychotherapy sessions were considered.

The Assessing Interpersonal Motivations in Transcripts method

The AIMIT (Liotti & Monticelli, 2008) method was developed to evaluate the activation of ISMs both in transcripts of psychotherapy sessions and in any kind of verbal interaction. According to the evolutionary theory of motivation, ISMs refer to basic motivational systems that regulate human social interactions: the attachment, caregiving, ranking-submission, ranking-dominance, sexual, and cooperative system (Liotti, 2011). The AIMIT is a validated method to investigate the interpersonal styles of both patient and therapist, as well as their interactions during sessions (Fassone *et al*., 2016; Fassone *et al*., 2012). It is useful for exploring the psychotherapeutic context, especially during moments of rupture/impasse, where ISMs are often disharmonious and chaotic. The transcript is divided into coding units, each represented by the speaker's locution and the interlocutor's reply. One or more ISMs may be detected within the same coding unit based on specific linguistic markers (Fassone, *et al*., 2016; Fassone, *et al*., 2012). In the present study, only the coding units related to the patient's ISMs were assessed. The selected transcripts were then analysed according to rules defined by Fassone *et al*. (2012). The AIMIT ratings were assigned through a double-blind procedure by different and trained independent coders.

The Metacognition Assessment Scale

The MAS is a 29-item tool used to evaluate the metacognitive abilities detected in an individual's verbalizations (Semerari, Carcione, Dimaggio, Falcone, Nicolò, *et al*., 2003). This instrument conceptualizes metacognitive functions as a set of relatively independent abilities (*i.e.*, monitoring, differentiation, integration, decentration) that allow us to understand mental phenomena to tackle tasks and master distress (Dimaggio, *et al*., 2009; Semerari *et al*., 2005; Semerari, Carcione, Dimaggio, Nicolò, & Procacci, 2007). For each ability, the interviewer assigns a score on a 5-point Likert scale (from 1= *very poor functioning* to 5= *very well-functioning*) to describe how well the individual employed that aspect of metacognitive functioning with respect to the assessed unit. Higher scores reflect higher metacognitive functions. As for the AIMIT ratings, the MAS scores were assigned through a double-blind procedure by different and trained independent coders.

The Attachment Style Questionnaire

The ASQ is a 40-item self-report questionnaire to evaluate adult attachment. Participants give answers on different items pertaining to secure and insecure attachment using a 6-point Likert scale (from 1 = *Strongly Disagree* to 6 = *Strongly Agree*). It consists of five scales: confidence, discomfort with closeness, relationships as secondary, need for approval, and preoccupation with relationships. The ASQ has adequate test-retest reliability, good internal consistency (α= 76–.86), and construct validity (Feeney, *et al*., 1994; Fossati, *et al*., 2003). In the current study, the Italian validated version of the ASQ was used (Fossati, *et al*., 2003).

Statistical analysis

The relationship between metacognitive functioning and the activation of patients' IMSs in the 58 psychotherapy sessions taken into consideration was analyzed through Spearman's *rho* correlation coefficients. Spearman's correlation coefficients between MAS scores and the number of activations of patients' IMSs were also performed, controlling for gender and number of sessions (*i.e.*, standardized residual). All analyses were performed with the Statistical Package for the Social Sciences (SPSS) version 18.0 (IBM, Armonk, NY, USA). All tests were two-tailed with an α=0.05.

Results

Table 2 illustrates the descriptive statistics of the AIMIT method, the MAS, and the ASQ.

Only four interpersonal motivational systems that could be detected through the AIMIT method emerged in the transcripts analysed in this study. More specifically, patients activated the at-

Table 2. Descriptive statistics of the Assessing Interpersonal Motivations in Transcripts method, the Metacognition Assessment Scale and the Attachment Style Questionnaire.

	Patient #1	Patient #2	Patient #3	Patient #4	Patient #5	Patient #6	Patient #7
Attachment M±SD	2.57±1.90	0.80±1.75	2.10±4.61	6.22±8.15	2.67±2.08	2.22±3.07	5.50±.63
Ranking Dominance M±SD	0.14±0.38	3.30±3.06	0.70±1.06	2.89±3.30	0.33±0.58	1.33±2.18	3.10±3.41
Ranking Submission M±SD	4.43±4.39	12.30±6.90	2.40±3.27	1.78±2.28	1.00±1.00	6.11±4.51	8.60±8.55
Cooperation M±SD	51.86±25.46	90.30±28.36	53.30±18.59	58.22±25.64	45.33±29.77	36.00±23.03	47.60±21.19
Self-monitoring M±SD	108.43±61.68	118.10±38.55	68.40±23.23	62.11±24.97	51.00±23.64	39.22±16.52	52.80±21.42
Differentiation M±SD	63.86±35.48	120.80±32.12	70.90±28.75	77.44±28.44	60.67±42.85	39.56±17.48	58.90±17.55
Integration M±SD	84.43±40.87	134.70±37.92	95.90±35.23	109.11±27.83	74.33±51.55	46.22±19.34	72.20±25.05
Decentralization M±SD	36.43±23.53	54.70±21.07	25.00±15.62	17.67±7.75	38.67±30.27	8.56±9.00	14.00±10.50
ASQ-C total score	29	27	25	33	30	25	23
ASQ-DC total score	32	42	35	47	44	34	39
ASQ-RS total score	11	19	15	25	18	13	17
ASQ-NA total score	28	21	21	19	20	32	31
ASQ-PR total score	33	30	35	26	29	32	37

M, mean; SD, standard deviation; ASQ, Attachment Style Questionnaire; ASQ-C, Confidence; ASQ-DC, Discomfort with Closeness; ASQ-RS, Relationship as Secondary; ASQ-NA, Need for Approval; ASQ-PR, Preoccupation with Relationships.

tachment, ranking-dominance, ranking-submission, and cooperative system. Moreover, as shown in Table 2, most of the patients presented low scores on the Confidence (ASQ-C) scale and high scores on scales that reflect an anxious and/or an avoidant attachment strategy. Our sample seems therefore characterized by insecure attachment patterns, sometimes implying both anxiety over abandonment and avoidance of intimacy, which could be suggestive of disorganized attachment patterns (for a detailed discussion of the ASQ scales and to obtain the normative data for the Italian population, see Feeney, *et al*., 1994; Fossati, *et al*., 2003).

Detailed correlations between metacognition values (measured through the MAS) and patients' activation of different ISMs during all 58 psychotherapy sessions are reported in Table 3.

The number of activations of the cooperative system was positively associated with all MAS sub-scales ($rho \geq 0.53$; $p<0.001$). The attachment system was also found to be negatively correlated with differentiation ($rho=-0.38$; $p=0.005$), integration ($rho=-0.35$; $p=0.007$), decentralization ($rho=-0.33$; $p=0.011$) sub-scales, and with the MAS total score ($rho=-0.38$; $p=0.004$). The association between the activation of the patient's cooperative system and all MAS sub-scales remained significant ($rho \geq 0.45$; $p<0.001$) even when controlling for gender and for the number of sessions taken into consideration for each patient. The attachment system remained negatively associated with both differentiation ($rho=-0.28$; $p=0.035$) and decentralization ($rho=-0.28$; $p=0.033$) sub-scales, and with the MAS total score ($rho=-0.26$; $p=0.046$).

Discussion

The results of this study show that the repeated activation of patients' cooperative system within the psychotherapeutic sessions is positively associated with higher metacognitive functioning. This gives empirical support to the supposed role of cooperation in fostering metacognitive functions within the therapeutic relationship (Allen, *et al*., 2008; Colle, *et al*., 2020; Liotti & Gilbert, 2011). The selective pressures for greater human cooperation led to the evolution of special cognitive skills for social coordination (Tomasello, 2018). Indeed, there is evidence that a cooperative attitude within the therapeutic relationship promotes a broad set of social cognition skills (such as joint attention, shared intentionality, and epistemic trust) that foster metacognitive abilities and, in turn, improve the effectiveness of psychotherapy (Fonagy, *et al*., 2021; Luyten, Campbell, Allison, *et al*., 2020). Scholars also postulated that cooperation improves a person's potential for mentalizing by increasing the individual's awareness of the options available for action (Fonagy *et al*., 2021). This, in turn, fosters the ability to explore and understand the processes that maintain maladaptive interpersonal schemas, generating new shared solutions for changing those schemas – a central psychotherapeutic aim in many different approaches (Colle, *et al*., 2020; Fonagy, *et al*., 2021; Safran & Muran, 1996). Additionally, the exercise of metacognition within a cooperative relationship promotes the therapeutic alliance on tasks and goals (Bordin, 1979), a factor that constitutes a key outcome predictor of effective treatment (Dimaggio, *et al*., 2009; Safran & Muran, 1996).

There was another relevant finding in the present study. The activation of patients' attachment system towards the therapist was inversely correlated with MAS total scores and with Differentiation, Integration, and Decentralization MAS sub-scales. This result can be explained by the presence of a probable insecure or disorganized attachment in our patients. This is consistent with clinical observations and research data suggesting a significant inhibition of metacognitive monitoring under the activation of attachment in patients with borderline personality disorder or other psychiatric disturbances (Colle, *et al*., 2020; Farina, Liotti, & Imperatori, 2019; Liotti & Gilbert, 2011; Luyten, Campbell, & Fonagy, 2020). Indeed, it has been hypothesised and partially demonstrated that activation of the attachment system in patients with disorganised attachment histories causes a loss of higher integrative functions, which in turn impairs the exercise of metacognitive monitoring (Farina, *et al*., 2019; Farina & Meares, 2022; Liotti & Farina, 2016). Consistently, neurophysiological research has shown that the exercise of metacognition requires high levels of brain connectivity and that activation of the attachment system in these patients results in a loss of connectivity and an impairment of metacognition (Farina *et al*., 2018; Farina *et al*., 2014). The fact that in our sample, consisting of several patients with borderline personality disorder, attachment activation appears to inhibit metacognition obviously has important therapeutic implications because it provides empirical support for the indication to modulate or even avoid the activation of attachment system within the therapeutic relationship (Liotti, Cortina, & Farina, 2008). It would be interesting to further investigate the attachment-exploration balance in psychotherapy and to better understand how and if the activation of this motivational system inhibits mentalization in different patients and clinical populations, both regarding their diagnosis and other aspects of their mental functioning, such as their attachment patterns. Moreover, it would be particularly valuable to investigate what kind of therapist's intervention are more effective in restoring the patient's ability for mentalization (*i.e.*, exploration of mental states) when patients activate their attachment system (which is often inevitable in psychotherapy).

Interestingly, even though competition and social rank have been demonstrated to affect metacognition (Colle, *et al*., 2020), we did not find any significant correlation between rank activations, both dominant and submitted, and MAS scores. Possible explanations for this lack of correlation can be the limited number of rank activations in our sample and the particular type of competitive attitudes that can be assumed as characteristics of

Table 3. Values of Spearman's rho correlation coefficient between metacognition values and the activation of patient's interpersonal motivational systems in all 58 sessions

	Attachment	Ranking-D	Ranking-S	Cooperation
Self-monitoring	-0.22	0.12	0.18	0.72***
Differentiation	-0.38**	0.08	0.11	0.64***
Integration	-0.35**	0.07	0.04	0.68***
Decentralization	-0.33*	-0.09	0.09	0.53***
MAS total score	-0.38**	0.06	0.13	0.71***

Ranking-D, Ranking Dominance; Ranking-S, Ranking Submission; MAS, Metacognition Assessment Scale. *Significant correlations are indicated by stars. *$p<0.05$; **$p<0.01$; ***$p<0.001$.

psychotherapeutic exchanges (Colle, *et al*., 2020; Lee, *et al*., 2018). Nevertheless, the activation of the rank system within the therapeutic relationship is not uncommon in some patients with histories of childhood maltreatment and personality disorders and must be managed by the psychotherapist because it can compromise the therapeutic alliance and the outcome of therapy (Liotti, 2017).

This study is preliminary and has several limitations. The number of the included psychotherapies and sessions explored is limited, also due to the duration and the complexity of the AIMIT procedure. Patients' attachment adult styles have been assessed by a self-report questionnaire that could be less reliable than a semi-structured interview such as the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1984). Furthermore, we did not evaluate the outcome of the included psychotherapies nor the quality of the therapeutic alliance. Thus, further studies assessing the quality of the alliance, its possible change across time and its role in the association between cooperation and metacognitive abilities should be carried out. Lastly, it would be also interesting to investigate the role played by the therapists' attachment styles (Talia, Taubner, & Miller-Bottome, 2019).

Conclusions

Despite these limitations, in our opinion, the results of the present study have important implications: they constitute initial empirical support for the role of cooperation in fostering metacognition within the therapeutic relationship. If confirmed and correlated to the treatment outcome, these findings would represent an important reference for psychotherapists. They highlight the importance of engaging patients in a cooperative therapeutic relationship or restoring it in case of ruptures or impasses. Further studies are needed with a larger number of observations and with an accurate evaluation of the quality of the therapeutic alliance and treatment outcome to be put in relation to cooperation and metacognition.

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