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METACOGNITION, MENTAL DISORDERS AND AGGRESSIVE BEHAVIOUR: A LONGITUDINAL STUDY.

Coordinatore: Ch.mo Prof. Giovanni Galfano

Supervisore: Ch.ma Prof. ssa Marta Ghisi

Co-Supervisore: Ch.mo Prof. Giovanni de Girolamo

Dottoranda: Valentina Candini

ABSTRACT

Metacognitive functions play a key role in understanding which elements might lead a person with severe mental disorder to commit violent acts against others. Indeed, understanding internal states such as thoughts, emotions, desires, fears and goals, both their own and those of others and differentiating between them, is needed in order to guide behaviour towards the resolution of interpersonal conflict. This is a fundamental aspect of affronting the risk of committing aggressive acts.

The aims of the study were the following: (a) to investigate the differences between patients with a poor metacognitive functioning and patients with a good metacognitive functioning in relation to history of violence; (b) to explore the differences between patients with a poor metacognitive functioning and patients with a good metacognitive functioning in relation to other important aspects potentially involved in aggressive behaviour such as personality traits, anger, impulsiveness, hostility and emotion recognition; (c) to investigate the differences between patients with a poor metacognitive functioning and patients with a good metacognitive functioning in relation to aggressive behaviour displayed by patients during the one year follow-up; (d) to analyse the predictors of aggressive behaviour and evaluate if the metacognitive functions associated with other investigated aspects are related to aggressive behaviour during the one-year follow-up.

The sample included 180 patients: 56% outpatients and 44% inpatients, the majority were male (75%) with a mean age of 44 ($\pm$9,8) years and half of them had a history of violence. The sample was split into two groups: Poor Metacognition (PM) group and Good Metacognition (GM) group, according to MAI evaluation

scores.

The PM patients reported a history of violence more frequently than GM patients (considering MAI total score), and in particular patients with poor monitoring, differentiating and decentering. Furthermore, PM patients showed less ability in emotion recognition and more frequently paranoid and narcissistic personality traits compared to GM patients. Concerning hostility, impulsivity and anger, no significant differences were found, except for 'Negativism' (i.e., BDHI subscale) that was higher in PM patients. During the 1-year follow-up, no differences between the PM group and the GM group in aggressive behaviours (verbal, against objects, self-aggression, against people) were found. The strongest predictors of aggressive behavoiur were: Borderline and Passive-Aggressive personality traits, history of violence, anger and hostility. The metacognitive functions alone did not predict aggressive behaviour, but metacognitive functions interacted with hostility manifested through direct and indirect aggression (two BDHI subscales) and with angry reaction through aggressive behaviour (one STAXI-2 subscale) in predicting aggressive behaviour. Indeed, these aspects predicted aggressive behaviour only in PM patients and not in GM patients.

This study leads to important conclusions: (a) certain aspects closely related with violence (e.g., hostility, anger) are predictive of aggressive behaviour only in patients with poor metacognition, thus good metacognition is a protective factors; (b) poor metacognition is associated with history of violence, which in turn increases the risk of committing aggressive behaviour. For this reason and considering that research in this field is still very limited, further studies are needed to deepen the role of metacognitive functions in relation to aggressive behaviour and to investigate whether psychotherapy focused on metacognitive functions is effective to prevent and/or reduce interpersonal violence.

RIASSUNTO

Le funzioni metacognitive svolgono un ruolo chiave nella comprensione di quali elementi potrebbero indurre una persona con gravi disturbi mentali a commettere atti violenti contro altre persone. Risulta, infatti, essenziale comprendere gli stati interni quali pensieri, emozioni, desideri, paure e obiettivi, sia propri che altrui, ed essere capaci di differenziarli tra loro, per poter guidare il proprio comportamento verso la risoluzione dei conflitti interpersonali. Per tale ragione, questo aspetto diviene fondamentale nell'affrontare il tema del rischio di violenza, cercando di comprendere ciò che discrimina persone con disturbi mentali che commettono agiti aggressivi e pazienti con gli stessi disturbi che non commettono tali atti.

Gli obiettivi dello studio erano i seguenti: (a) indagare le differenze tra pazienti con uno scarso funzionamento metacognitivo e pazienti con un buon funzionamento metacognitivo in relazione alla storia di violenza; (b) esplorare le differenze tra pazienti con uno scarso funzionamento metacognitivo e pazienti con un buon funzionamento metacognitivo in relazione ad altri importanti aspetti potenzialmente coinvolti in comportamenti aggressivi come i tratti della personalità, la rabbia, l'impulsività, l'ostilità e il riconoscimento delle emozioni; (c) investigare le differenze tra pazienti con uno scarso funzionamento metacognitivo e pazienti con un buon funzionamento metacognitivo in relazione al comportamento aggressivo manifestato durante l'anno di follow-up; (d) analizzare i fattori predittivi del comportamento aggressivo e valutare se le funzioni metacognitive associate ad altri aspetti indagati sono correlate al comportamento aggressivo agito durante il follow-up.

Il campione è costituito da 180 pazienti: 56% ambulatoriali e 44% residenziali, la maggior parte erano maschi (75%) con un'età media di 44 anni (+9,8) e metà di essi aveva una storia di violenza. Il campione è stato diviso in due gruppi: il gruppo Scarsa Metacognizione (PM) e il gruppo Buona Metacognizione (GM), in base ai punteggi ottenuti nella valutazione dell'intervista metacognitiva (MAI).

I pazienti con scarsa metacognizione hanno riportato più frequentemente una storia di violenza rispetto ai pazienti con buona metacognizione (considerando il punteggio totale MAI), e in particolare i pazienti con scarsa metacognizione nelle specifiche funzioni di monitoraggio, differenziazione e decentramento. Inoltre, i pazienti con scarsa metacognizione presentavano meno abilità nel riconoscimento delle emozioni e più frequentemente tratti di personalità paranoidi e narcisistici rispetto ai pazienti con buona metacognizione. Per quanto concerne l'ostilità, l'impulsività e la rabbia, non sono state riscontrate differenze significative tra i due gruppi, ad eccezione del "Negativismo" (sottoscala del BDHI), che era più alto nei pazienti con scarsa metacognizione. Anche nel caso dei comportamenti aggressivi (verbali, contro oggetti, auto-aggressivi, contro le persone) manifestati durante l'anno di follow-up, non sono emerse differenze significative tra i due gruppi. I dati rivelano che i predittori del comportamento aggressivo sono i seguenti: tratti di personalità borderline e passivo-aggressivi, storia di violenza, rabbia e ostilità. Le funzioni metacognitive da sole non predivano il comportamento aggressivo, ma esse interagivano con le seguenti dimensioni in tale predizione: l'ostilità manifestata attraverso aggressioni dirette e indirette (due sottoscale del BDHI) e le reazioni rabbiose agite tramite il comportamento aggressivo (una sottoscala della STAXI-2). Infatti, questi aspetti emergevano come predittori dei comportamenti aggressivi solo nei pazienti con

scarsa metacognizione e al contrario, non risultavano più predittori nei pazienti con buona metacognizione.

Questo studio porta a importanti riflessioni: (a) alcuni aspetti strettamente correlati alla violenza (ad esempio, ostilità, rabbia) sono predittivi di comportamenti aggressivi solo in pazienti con scarsa metacognizione, facendo risutare la buona metacognizione come fattore protettivo; (b) la scarsa metacognizione è associata alla storia di violenza, la quale a sua volta aumenta il rischio di commettere comportamenti aggressivi. Per tale ragione e considerando che la ricerca in questo campo è ancora molto limitata, sono necessari ulteriori studi al fine di approfondire il ruolo delle funzioni metacognitive in relazione al comportamento aggressivo, e per indagare se la psicoterapia orientata al miglioramento delle funzioni metacognitive può rivelarsi efficace nel prevenire e/o ridurre la violenza interpersonale .

Contents

INTRODUCTION

In order to investigate and understand which elements might lead a person to commit violent acts against others, the ability of each individual to recognize and verbalize thoughts, feelings and behaviours and link them to each other, plays a key role. These skills include those belonging to their own state and those of other individuals, and finally the ability of distinguishing them as different mental states. These dimensions are well explained by several theoretical approaches: the theory of mind (Baron-Cohen, Leslie & Frith, 1985), mentalization (Bateman & Fonagy, 2004), metacognition (Semerari et al., 2003; Wells, 2000), and so on.

The current study focuses on people with severe mental disorder. Indeed, the literature indicates that these people are more likely to act violently compared to the general population. Nevertheless, not all people with severe mental illnesses commit violent acts (Torrey, 200). Consequently, the core aim is to investigate whether poor metacognitive functions as a potential risk factor in people with severe mental disorders who have committed aggressive behaviour compared to people with the same disorders but who did not commit such acts.

It is clear that the ability to understand internal states such as thoughts, emotions, desires, fears and goals, both their own and others and to differentiate them, is needed in order to guide behaviour towards resolution of interpersonal conflicts. Indeed, this is a fundamental aspect, concerning the risk of committing aggressive acts.

In the first chapter the concept of metacognition is described, first through the presentation of the different approaches that dealt with this construct, then through the deepening of the theoretical approach of metacognition used in the present research.

The second chapter describes through the literature, the topic of metacognition in patients with mental disorders and specifically metacognition in patients who conducted violent behaviour. The last chapter presents the research on metacognitive functions in patients with severe mental disorders and history of violence (half of the sample), while comparing a group of patients with poor metacognition to a group of patients with good metacognition, and then monitoring aggressive behaviour of all the patients during 1-year follow-up. Finally, discussion of the data, research limitations and clinical implication are argued.

CHAPTER 1

THE METACOGNITION

1.1 Metacognition: a multidimensional construct for various theoretical approaches

The concept of metacognition refers to an individual's ability to recognize internal states and consequently, to build a complete and complex representations of themselves and others, including all elements of human experience, thoughts, emotions and behaviour. Furthermore, the same concept is used to describe how such representations guide the action of individuals, especially in difficult situations.

These skills, depending on the context in which they are studied, are described by various theoretical constructs that focus on one or more aspects of these complex and crosswise skills that are present in each individual's daily experience. In order to have a more comprehensive picture of this construct and to avoid lexical and conceptual confusion, the main approaches concerning the study of these skills have been described in detail.

The **Theory of Mind** (ToM; Baron-Cohen et al., 1985; Premack & Woodruff, 1978) was developed in relation to developmental disorders in pathologies such as Autism, Asperger's syndrome, etc.. In this case, the ToM focuses on recognizing the mental states of others, in particular referred to cognitive attributes.

According to Baron-Cohen, the main characteristic of Autism would be a sort of blindness to mental content. A person with Autism has deficits in perceiving the existence of mental states in other people, and therefore this person appears incapable of giving a mentalistic explanation of social interactions. ToM's abilities consist of the functioning of an innate component of the cognitive system that corresponds to the neurobiological maturation of a specific brain area, aimed

at understanding mental states (Baron-Cohen et al, 1985; Leslie, 1987). In Autism, this maturation could already be compromised during the early stages of life, or in more advanced periods. This condition would explain the symptomatic heterogeneity of the autistic syndrome, which includes both children totally isolated from the world, and individuals with good intellectual abilities, such as those affected by Asperger's syndrome (Leslie, 1987).

A similar explanation has been proposed for schizophrenia disorders. According to Frith (1992), patients with schizophrenia have similar problems to those of autistic patients, due to ToM malfunction. Frith (1992) noted however, that the development of people with schizophrenia appears completely normal until the first psychotic episode. At the moment of onset, there is degeneration of neuronal populations in the orbit-frontal cortex (Frith et al, 1992). Frith suggests that delirium and hallucinations are effects of trying to give meaning to one's own and others' events and thoughts, after having lost the ability to represent and link them.

In explanation of these deficits, ToM is considered an "all-or-nothing" phenomenon: if present, it allows normal functioning of the skills related to the attribution of mental states. Whereas when absent, it causes difficulties in social interaction.

Mentalization (Bateman & Fonagy, 2004) implies the attribution of meaning to one's own and others' actions, based on intentional mental states such as desires, feelings and beliefs. Giving sense to what is in the mind allows one to understand his/her and others' mental states, a fundamental ability that converges in the development of self-representation. This theory refers both to conscious and unconscious or pre-conscious processes. It is also strictly bound to the attachment theory (Bowlby, 1988), since this construct places the development of these skills in the primary relationships and in the early stages of life.

Good child development would be based on the caregiver's mirroring abilities of the child's mental states, in an "emphasized" and contingent manner, i.e., centered on the mental states experienced by the child during a specific moment (Bowlby, 1988). This feedback allows the child to perceive him/herself as a thinking entity/body with his/her own mental states, modulating his/her positive and negative emotions. The deviations from this evolutionary pathway could lead the individual to develop itineraries towards the psychopathology of mental disorders (Bowlby, 1988). In this direction, metallization involves a careful analysis of the circumstances in which action takes place, of previous behaviour patterns and of experiences to which the individual has been exposed.

Alexithymia (Helmes, McNeill, Holden & Jackson, 2008; Taylor Bagby & Parker, 1991; Vanheule, 2008) indicates the difficulty to experience, recognize and describe emotions through words (above all ones own). Therefore, this inability leads people to physically express their emotions (through physical pain or self-aggression or aggressive behaviour), and also to create confusion between bodily sensations and emotional states. Emotions are manifested across physiological, motor-behavioural and cognitive-experiential dimensions and are expressed through a very complex form of interpersonal communication.

People with alexithymia especially lack cognitive-experiential components and interpersonal communication of emotions. The physiological and motor-behavioural levels remain without a conscious, cognitive and verbal elaboration. Furthermore, individuals with this deficit fail to use interpersonal relationships in emotional regulation, and the privation of social sharing prevents identifying emotions. Indeed, alexithymia is considered a disorder of affective regulation (Taylor et al., 1991).

Most psychoanalytic theories place the origin and structure of these skills in the first years of a child's life, based on their relationship with a caregiver (Bion, 1962; Grotstein, 1986; Kohut, 1971; Main, Kaplan & Cassidy 1985; Winnicott; 1965).

Social Cognition studies (Bruner et al., 2007; Couture, Penn & Roberts, 2006) deal with processes through which people acquire information from the environment, interpret, store and recover them from memory. These processes aim to understand their social world and to organize behaviour in order to regulate social interactions.

Social cognition is an interpersonal and reflective approach (Higgins & Bargh, 1987) that emphasizes cognitive processes in the social psychology field. People are characterized by the need of "knowing" reality, in large part made up of other people, in order to orientate their behaviour in an adaptive way to their environment. Social cognition investigates the way in which social information is organized in memory, considering many daily stimuli and limited resources of individuals. For this reason, the cognitive system would be controlled by a principle/rule "to obtain the maximum result with the minimum effort". According to this concept, knowledge is based on the need to select information, through targeted classification processes. Therefore, individuals use "heuristics", or shortcuts of judgment, which allow them to decide even in the absence of sufficient data. Attributions of causality, social categorizations, heuristics of thought are the main themes of interest of social cognition.

Finally, the **Metacognition** theory, developed by Wells (2000; 2009), describes this skill as the aspect of mental functioning that controls attentive and thought processes, i.e., a set of factors that rules the evaluation and control/check of knowledge processes. These factors can be divided into beliefs, experiences and strategies. According to Wells' theory, metacognitive beliefs perform a useful function only if are utilized sparingly, otherwise, instead of regulating thoughts

and emotions, they deregulate them because they lead to the harmful prominence of conscious activity.

The Wells' model indicates three levels of mental functioning. (a) First level: rapid and automatic cognitive processes that are chaotically developed all together (organized in parallel), which produce general negative or positive emotional evaluation (or at a level more slightly sophisticated fear, anger, joy). (b) Second level: conscious processing of thoughts (sequentially organized) based on a certain logical order, i.e., transparent and detailed elaborations (the person knows why he/she thinks of something). (c) Third level: knowledge stored in long-term memory in a metacognitive form.

In the present research, the explanatory model of metacognition used is that developed by the Third Center of Cognitive Psychotherapy (Carcione et al., 2008; Semerari, Carcione, Dimaggio, Nicolò & Procacci 2007; Semerari et al., 2012; 2014), as it is the best choice for the aims of the study. This approach defines metacognition as a complex system, composed of several functions in interaction between themselves, but also partially independent. This model differs from previous ones, which consider metacognition as a unique function, present or absent, or a function with several (hierarchic) levels but closely interconnected and non-independent. Moreover, this approach includes several dimensions considered by other theories only in a fragmented and partial way, such as ToM, alexithymia, social cognition. Furthermore, neuroscience studies show data that favors multifunction conception, highlighting specific aspects of metacognition (self-awareness and understanding of others' mental states), relatively independent from each other but interconnected through functional networks (Mitchell, 2006; Saxe, Carey & Kanwisher, 2004).

In addition, the metacognitive construct developed by Third Center of Cognitive Psychotherapy explains metacognitive functions by dividing abilities

that represent their own internal states (cognitive, emotional and motivational) and those regarding the understanding of others' internal states. Finally they consider how such representations guide behaviour in solving interpersonal problems.

Thus, this approach is able to identify and distinguish skills that might be essential in the risk of committing violence, such as the difficulty to understand and express one's own emotions on the one hand, and to understand others' mental states and their intentions on the other. This could lead to maladaptive management of interpersonal relationships and the consequent risk of violence as a resolution of conflict.

1.2   Metacognition: definition according to the model of the Third Center of Cognitive Psychotherapy (Rome)

Metacognition, according to Third Center of Cognitive Psychotherapy (Carcione et al. 2008; Semerari et al. 2007; 2012; 2014), refers to a broad set of cognitive and affective skills, which allow people to identify mental states, to reason them and to ascribe them to themselves and others. These skills allow us to recognize why a person reacts psychologically based on regularities and personal constructs over their lifespan.

Two ideas guided this metacognition research programme (Carcione et al., 2008; Semerari et al., 2003). The first was that patients during psychotherapy sessions were unable to think in terms of mental states – i.e., metacognitive disorders – and this impacts treatment. Indeed, it was more difficult to plan treatment for people incapable of describing their own goals or emotions and with problems that make sense of therapists' words and intentions. Therefore, metacognition appears to be a variable necessary to undertake any type of psychotherapeutic treatment, but it is impaired in those patients who ought to

derive the greatest benefit. Thus, it is both a prerequisite for treatment and at the same time, a therapeutic goal.

The second idea was that the problem was not the same for all patients. Certain patients have serious difficulties translating their somatic states into affective language ("It's as if I had a continuous cramp in my stomach") and explaining the causes and motivations for their actions and states ("Today I've been in a bad mood; the moon must be against me"), while others have few problems in this area but were unable of distinguishing intrusive thoughts ("My colleagues are persecuting me", "I'm being forsaken by everybody") from the real state of things. Cognitive science provided the tools which support and prove that metacognition consists of specific facets that together constitute a system, which is in some ways composed of a set of modules, i.e., parts of the mind specialized in processing particular information. (Nichols & Stich, 2000)

The Third Center of Cognitive Psychotherapy operationalized the term metacognition as follows (Carcione et al., 2008; Semerari et al., 2007; 2012; 2014): Metacognition is a set of skills necessary for: a) identifying mental states and ascribing them to oneself and others on the basis of facial expressions, somatic states, behaviour and actions; b) reflecting on and reasoning about mental states; c) using information about mental states to decide, solve problems or psychological and interpersonal conflicts, and master subjective suffering.

Therefore, this definition includes:

a)   The awareness of being an individual distinct from others and experiencing self-generated thoughts and emotions, thus thinking of oneself as an intentional agent. The awareness that others can influence one's own thoughts and affect them through advice, dialogue or behaviour, but that others cannot dictate one's own ideas and affect or insert them in one's mind.

b)   Identifying mental states and cognitive and affective processes. For example, identifying one's own emotional state or perceiving that one's actions are driven by a need, desire or intention; evaluating correctly one's memory; deducing others' emotions or intentions from facial expressions or behaviour;

c)   Reflecting on, reasoning about mental states; grasping the links between mental events and behaviour, pinpointing similarities in one's reactions to events, distinguishing the subjectivity of one's own point of view from external reality, distinguishing between different categories of representation (perceptions, memories, dreams, fantasies, etc.) and handling them correctly; constructing coherent narratives to explain variations in mental states over time and making sense of potential contradictions;

d)   Using psychological knowledge purposefully and intentionally to adjust action and modify plans and strategies as necessary, when events and contexts evolve; managing psychological problems and resolving conflicts, using strategies consistent with one's goals and mastering subjective suffering.

What this definition immediately makes clear is that metacognition is a conscious reflective process, in which psychological information is used knowingly and intentionally. This definition excludes defensive automatisms. Individuals under stress may abuse alcohol, eat too much or resort to physical exercise in an automatic manner, without being aware that these strategies are aimed at reducing mental suffering. Similarly, automatic actions aimed at eluding a feared situation, such as avoiding taking a bus in the case of panic attacks, are not necessarily metacognitive actions, unless a person is aware of his/her strategy and explicitly says or thinks: "I get too tense when I take the bus and so I avoid it".

Another key aspect is the distinction between true metacognition and a sort of "pseudo-metacognition" (Carcione et al., 2008; Semerari et al., 2003). In their daily lives, individuals constantly perform pseudo-mentalistic acts. They might,

for example, speak about their angry partner, saying things such as "because he's a nervous type", thus using a generic personality trait as a motivation without explaining what "being a nervous person" means. Or they might use stereotypical descriptions of behaviour: for example, saying that an adolescent abuses alcohol "because adolescence is a turbulent period of life involving a lot of stupid behaviour".

Another pseudo-mentalistic act is the generic description of others, without detailed explanations of a specific person's way of functioning and reacting under specific environmental conditions. For example, people use pseudo-metacognition when they resort to general theories - such as "we live in a selfish society", "foreigners don't want to integrate in this country", "men don't want to get involved in looking after relatives" or "women change their mood without reason" to explain others' actions (Carcione et al., 2008; Semerari et al., 2003). The individuals activate metacognitive functions when they try to process information which is: a) specific, b) obtained in a particular moment, c) related to a precise intra-psychical or interpersonal context, and d) related to episodes occurred within defined space and time boundaries.

Metacognition differs from simple "insight", i.e., the awareness of one's emotions and thoughts and the ability to place them in personal history. Indeed, metacognition is a form of "applied insight" (Carcione et al., 2008; Semerari et al., 2003). Through metacognitive functions, people can use their psychological knowledge and reasoning about their own and others' mental states to; solve problems, master subjective suffering, settle conflicts with others, negotiate their desires and goals on the basis of an understanding of themselves and others, and apply this knowledge to appropriate strategies. Moreover, metacognition is an essential social life skill, which allows an ongoing regulation of relationships and

guides one's behaviour based on their own and others' mental states (Carcione et al., 2008; Semerari et al., 2003; 2007; 2012; 2014).

Therefore, it is clear that a good metacognitive functioning promotes an adaptive resolution of interpersonal problems in people, whereas poor metacognitive functioning brings bad management of conflict that could lead a person to perform different types of aggressive behaviour, such as a maladaptive strategy to face difficulties.

1.3   Metacognition in clinical practice

Dysfunctions in metacognition are associated with low social functioning, low quality of life, symptoms of several mental disorders and they seem to predict worse treatment responses (Carcione et al., 2011; Lysaker, Outcalt & Ringer 2010; Lysaker et al., 2011a; Ogrodniczuk, Piper & Joyce, 2011; Semerari et al., 2007).

Clinical observations have found that, even in less serious illnesses than autism and schizophrenia, impaired metacognitive functions can help explain the persistence of psychical suffering, existential difficulties and cases of failure to respond to treatment in other pathologies as well, such as Personality Disorders (PDs) (Dimaggio, Nicolo, Semerari & Carcione, 2013; Dimaggio & Stiles 2007; Fonagy, 1991), Mood Disorders (Allen, Bleiberg, Haslam-Hopwood, 2003; Inoue, Yamada & Kanba, 2006; Wolf, Brune & Assion, 2010), Eating Disorders (Olstad, Solem, Hjemdal & Hagen, 2015; Skarderud, 2007) and Post-Traumatic Stress Disorders (Fonagy, 2004; Liotti, 2006). A lack of contact with their mental states prevents people from being able to access information about thoughts and emotions that underlie behaviour. This makes it difficult for them to understand their own reactions and the factors driving their actions, and also causes the same difficulty for an interlocutor. These in turn result in problems in interaction, empathy and building shared plans.

In cognitive psychotherapy, patients are constantly encouraged by their therapists to reflect on their inner states, explore points of view different from their own interpretation schemas, and they are encouraged to experiment techniques for tackling and solving problematic states. Therefore, metacognitive skills are required and if lacking, they hamper the whole treatment process and cause intra-psychical and interpersonal problems.

At the same time, improvement of metacognitive abilities constitutes the main goal of psychotherapy, which in particular allows personal improvement. Poor metacognition, for example, makes it difficult to: (a) understand internal signals telling us that we are tired, tensed, energetic, etc.; (b) imagine the relational causes behind our emotions and behaviour; (c) deduce motivation driving others' actions and on the basis of this information, carry out action consistent with our own goals; (d) decode facial expressions; (e) distinguish between fantasy and reality; (f) utilise information we have on mental states to comprehend others.

Consequently, therapists could have difficulty in properly identifying emotions and thoughts, even when they ask specific and repeated questions. Such patients also have difficulty understanding their therapist's intentions and building a cooperative relationship based on a problem-solving attitude and on shared plans (Dimaggio & Stiles, 2007).

A series of clinical observations describe metacognitive dysfunction in the Personality Disorders' (PDs) field; low general self-reflective skills and difficulties in integrating are features common to the various PDs (Bateman and Fonagy 2010; Bateman, O'Connell, Lorenzini, Gardner & Fonagy, 2016; Lysaker et al., 2017; Semerari et al., 2014; Westen & Shedler, 2000). Symptoms, social functioning, interpersonal problems and obstacles to treatment differ in line with the specific metacognitive dysfunction that causes different problems.

In general, patients with severe mental disorder could display difficulties in identifying the emotional and ideational components of their mental states, in relating ideas to emotions and in connecting ideas or emotions to environmental and interpersonal events (Bateman & Fonagy, 2010). Such narratives typically involve facts and action with only limited or vague reference to mental states or the processes underneath (Carcione et al., 2008; Semerari et al., 2003a). People suffering from these deficits could maintain the ability to deduce others' emotions and thoughts (not always), therefore they use expressive signals to understand whether the other is, for example, cheerful, sad or worried. It is when trying to find the motivation for these emotional states that their interpretations become rigid, stereotyped, often unrealistic and at times strongly egocentric.

Other possible problem is distinguishing between fantasy and reality. In these cases, the patients could have trouble to distinguish thoughts and dreams from external events.

The last problem emerging from clinical observations regards building integrated and coherent narratives about one's mental processes, or using such knowledge to purposefully regulate mental states. The use of knowledge of mental states to master suffering and solve interpersonal problems appears to be fundamental for psychological and social functioning. Individuals therefore need a wide range of mental problem-solving and coping strategies. The appropriateness of these strategies can be evaluated by considering the congruence ratio between means-goals and costs-benefits, i.e., the adaptive value of the strategy used (Carcione et al., 2008; Semerari et al. 2003a,b; 2007; 2012; 2014).

Thanks to evidence from neuroscience, the existence of specific aspects of metacognition, relatively independent from each other but nonetheless linked, has been demonstrated. It has emerged that humans have certain brain areas that are more specialized in thinking about one's own inner states as well as in decoding

the minds of others, which are activated selectively in order to help comprehend the minds of others considered different from their own (Mitchell, 2006). Thinking about personality traits involves different areas compared to thinking about affects (Heberlein & Saxe, 2005). Moreover, in selected populations such as schizophrenic patients, metacognitive problems are partially unconnected to impaired cognitive skills and have a greater impact on patients' social and professional roles, quality of life and symptoms compared to one's cognitive dysfunctions (Brune, Abdel-Hamid, Lehmkamper & Sonntag, 2007; Hasson-Ohayon et al, 2015; Lysaker et al., 2014a).

To summarize, there are networks of metacognitive functions, so consequently there is a need for an assessment tool that: 1) considers metacognition to be made up of distinct sub-functions; 2) evaluates each sub-function separately; 3) evaluates both the abilities possessed by a person in one moment of their life, and the evolution over time of these sub-functions.

1.4   Metacognition Assessment Interview (MAI): a deep description

The Third Centre has developed a scale to measure the various elements contributing to metacognitive skills which; a) manifest themselves in clinical practice; b) are significant in psychopathological terms; c) have an impact on treatment, and d) are distinct from each other. The idea is that metacognition is composed of a set of linked processes. All processes are connected to the ability to identify and ascribe meaning to mental states, at the same time they are semi-independent of each other, and consequently these processes could be functioning or impaired autonomously from each other.

Therefore, the Metacognition Assessment Scale (MAS; Semerari et al., 2003b) aimed to identify metacognitive dysfunctions in patients and to evaluate whether they differed from patient to patient and whether success or failure in treatment

was linked to these skills. The MAS is a rating scale assessing metacognition displayed by patients in their verbalization during psychotherapy, and is divided into three scales: understanding of one's own mind, understanding of others' mind and mastery. Each scale is further composed of different sub-functions. The MAS does not stimulate metacognitive functions through specific questions. Therefore, when the therapist does not directly investigate one specific sub-function, it is impossible to define whether the lack of this sub-function is due to impairment or simply to non-use of it in that specific circumstance.

The Metacognition Assessment Interview (MAI; Semerari et al., 2012), an adaptation of the MAS, is a semi-structured interview that assesses metacognitive functions through a sequence of specific pre-established questions. Interviews, moreover, have advantages such as avoiding bias in self-ratings, especially as the patient is called upon to use skills such as self-reflection, which could be compromised. Through the MAI, the interviewer asks the patient to reason about mental states in the context of relevant and conflictual personal matters, i.e., when it is most important (but also difficult) to be able to fully and swiftly understand the mental states of oneself and others. The common theoretical framework of the MAS and the MAI is that metacognition is made up of specific and relatively independent sub-functions that are likely to be selectively impaired in clinical populations.

The hypotheses were that (a) metacognition could be elicited by such an interview and could be reliably scored; (b) metacognition has a two-factor structure, corresponding to separate domains, one for understanding mental states of one's self and one for understanding the mental states of others.

The MAI assesses the description of emotions and cognitions, and the ability to identify their own and others' recurrent patterns of thinking, feeling and dealing with social problems. The interview evaluates two main functional skill

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domains of metacognition, 'Self' and 'Other', each composed of two dimensions: monitoring and integrating for 'Self', differentiating and decentering for the 'Other'.

To identify the 16 basic facets of which the dimensions are composed (four facets for each dimension), the authors took the clinical literature that describes deficit in the ability to know and regulate mental states into account: mentalization and attachment theories (Allen, Porter, McFarland, McElhaney & Marsh, 2007; Fonagy, 1991; Fonagy and Target, 1997; 2006; Main et al, 1985), theory of mind (Baron-Cohen et al., 1985; Premack and Woodruff, 1978; Wellman & Woolley, 1990), metacognition (Wells, 2000) and more generally, meta- representation (Frith, 1992).

The 'Self' domain indicates the way in which a person has explicit access to his/her own mental state (cognitive and emotional) in relation to behaviour. It includes 'monitoring' and 'integrating' functions, as defined below (Semerari et al., 2012).

'Monitoring' (MON) refers to the ability of identifying and verbalizing one's own inner states (emotions and cognitions) and subsequent behaviour during a described real-life episode. MON consists of four facets: (a) recognizing one's own representations (thoughts and beliefs); (b) recognizing and verbalizing one's own emotions (and bodily sensations); (c) establishing relationships between these components of mental states, and (d) establishing relationships between components of mental states and behaviour. MON evaluates how a subject explains his/her own behaviour in terms of causes and/or motivations. When there is a monitoring deficit, the person is unable to identify and to discern the reasons for his/her behaviour, and he/she cannot recognize or verbalize emotions or other mental states.

'Integrating' (INT) is the second dimension of the 'Self' domain and it involves the ability to produce coherent descriptions of one's own mental processes. INT consists of the capacity to reflect on mental states and contents, to put them in a logical order and to rank them by relevance. By using INT abilities, the subject is able to understand the link between his/her own mental states and different behaviour in different situations, to decode his/her functional and dysfunctional habits and to create a consistent narrative of how his/her functioning patterns (cognitive, emotional and behavioural) has changed over his/her lifespan.

INT comprises four facets: (a) understanding and telling coherent links among thoughts, feelings, events and behaviour; (b) describing transitions among different mental states over the course of time and explaining the reasons why; (c) creating generalized representations of his/her mental functioning, taking into account continuity over time of their own patterns of thinking and feeling; and (d) describing one's own mental functioning to the interviewer, providing enough information, without giving irrelevant and out-of- focus details and giving a sense of order and coherence to the discourse.

The 'Other' domain refers to skills used to understand thoughts, emotions and behaviour of others and to differentiate them from their own. This domain comprises 'differentiating' and 'decentering' functions, as defined below (Semerari et al., 2012).

Differentiating (DIF) concerns the ability to recognize the representational nature of one' s own and other individuals' thoughts, and to differentiate between different types of representations, such as imagination, evaluation, expectation, dreams, etc.. This skill allows people to distinguish between representation and reality and to consider one's own point of view as subjective and different of other's points of view. Therefore, good DIF functioning makes people flexible in

formulating opinions and points of view and leads to changed mental states on the bases of communicative acts and the availability of salient information.

DIF includes four facets: (a) considering one's own representation of the world as subjective and questionable; (b) giving plausible interpretations of events; (c) reflecting on and evaluating events (as opposed to a tendency to act impulsively); and (d) distinguishing between different mind representations such as dreaming, fantasizing and imagining.

'Decentering' (DEC) indicates the capacity to infer others' mental states in a plausible manner and adopt the perspective of others, recognizing that it is distinct from their own. DEC leads to the comprehension that people's behaviour is based on the understanding of others' aims, beliefs and values, which could be different from their own and independent of the relationship that the person has with the subject.

DEC involves the ability to describe others' psychology in a plausible and clear way, without using stereotypes or *cliché*. Furthermore, it also includes the skill to realize that they are generally not the center of others' intentions and goals. DEC comprises four facets: (a) recognizing, defining and verbalizing other people's emotional inner state; (b) recognizing, defining and verbalizing other people's cognitive inner state; (c) establishing links among the separate components of others' mental states; and (d) establishing links between the components of others' mental states and their behaviour.

The MAI consists of four modules, corresponding to the four metacognitive functions described above. For each function, the interviewer has to ask a structured list of questions. For more details, the Appendix 1 reports the entire interview.

To evaluate whether patients are really trying to use their metacognition, the interviewer needs to a) gather background information about where and when the

formers' narrative took place, who was present, what the topic of the story is and what the problem described is, and b) assess the emotional states (if possible, with somatic correlations) and thoughts that patients experienced at that moment, and c) patients have to provide sufficient details regarding what led them to ascribe a given mental state.

CHAPTER 2

METACOGNITION IN PATIENTS WITH SEVERE MENTAL DISORDERS

2.1   Metacognition and Schizophrenia

Many studies have demonstrated metacognitive impairment among people with schizophrenia spectrum disorders (Arnon-Ribenfeld, Hasson-Ohayon, Lavidor, Atzil-Slonim & Lysaker, 2017; Hasson-Ohayon et al., 2015; Lysaker & Hasson-Ohayon, 2014; Vohs et al. 2014).   The role of metacognition has been evaluated in various studies including both clinical and non-clinical populations (Hasson-Ohayon et al., 2015; Ladegaard, Lysaker, Larsen & Videbech, 2014; Lysaker et al., 2014b). These studies reveal that individuals with various psychiatric diagnoses experience varying levels of metacognitive deficits: a variance has also been found in a non-clinical population (Rabin et al., 2014). In particular, Hasson-Ohayon et al. (2015) found that among people with schizophrenia, metacognitive capacity was significantly lower than in non-clinical populations. Given the important effect of these deficits on both an individual's experience and on the maintenance of interpersonal relationships (Harrington, Siegert & McClure, 2005; Langdon Coltheart, Ward & Catts. 2002; Lysaker, Campbell & Johannesen 2005a), there is a need to pay particular attention to metacognitive functions among people with schizophrenia spectrum disorders. In the original findings of Lysaker et al. (2005b; 2007), individuals with schizophrenia displayed impaired metacognition, which in turn diminished their capacity in relation to symptoms, neurocognition, as well as social and vocational functioning.

Several studies have explored the links between metacognition and symptoms, both positive and negative, emotional discomfort (including anxiety, depression, active social avoidance and guilt), cognitive symptoms and disorganized symptoms. It is evident that metacognition deficits are associated

with negative symptoms (Lysaker et al., 2012, 2015a; Mitchell, 2012; Nicolò et al., 2012), disorganization symptoms (Lysaker, Dimaggio, Buck, Carcione, & Nicolo, 2007), depressed mood and delusions (D'Antonio & Serper, 2012), poor social support, relationship quality (Kimhy et al., 2012) as well as reduced independent living (Tabak et al., 2015).

Furthermore, the role of metacognition in young individuals, developing their first psychotic episode, has also been investigated. This is an important issue, since detecting metacognition deficits at this stage could help to identify treatment goals when the illness is more malleable and psychological interventions could positively affect the course of the disorder (Alvarez-Jiménez et al., 2011). Some authors demonstrated that dysfunctions in metacognition are present in both early and later phases of schizophrenia (Brune et al., 2011; Lysaker et al., 2015b; Macbeth et al., 2014; Vohs et al., 2014). Mcleod et al. (2014) found that metacognitive dysfunction is a characteristic of the early phases of the illness, which predict positive and negative symptoms that appear 12 months later. This would suggest that this is a significant contributor to suffering and social dysfunction as early as the very initial stages of the disease. Furthermore, in Langdon et al.'s study (2014), patients with early psychosis showed difficulties in understanding others' mental states. This was evident in tasks that involved sequencing humorous pictures requiring inference about the characters in the stories shown.

Metacognitive dysfunction might also impair help-seeking before initial contact with the mental health services, and this has an impact on the duration of untreated psychosis (DUP) phase (Macbeth et al., 2016). Although there is a well-known association between prolonged DUP and poorer outcomes (Penttilä, Jääskeläinen, Hirvonen, Isohanni, & Miettunen, 2014), evidence is still limited regarding associations between DUP and metacognition. Additionally, some authors showed that poor metacognition has been consistently associated with

poor insight into illness (Bedford & David, 2014; Lysaker et al. 2013a; Lysaker, Pattison, Leonhardt, Phelps & Vohs, 2018; Nicolò et al., 2012; Popolo et al., 2016) and that the reduced self-reflection is related to poorer therapeutic outcomes (Lysaker et al., 2010). Moreover, the incapability to integrate various aspects of themselves and others in a coherent psychological representation may obstruct remembering positive aspects of relationships during moments of distress and this could lead to disengagement from therapeutic pathways (MacBeth, Gumley, Schwannauer & Fisher et al., 2015). All these findings confirm the need to take action as soon as possible when considering metacognitive deficits.

Another important issue is the relationship between metacognition and psychosocial functioning. Several studies have demonstrated that metacognitive dysfunctions affect patients' quality of life and social functioning (James et al. 2016; Lysaker et al. 2015b; Penn et al. 1997; Roberts & Bailey, 2013), vocational functioning (Lysaker et al., 2011b; Luedtke et al., 2012), self-care (Brune et al., 2011) and social quality of life (Hasson-Ohayon et al., 2015; Rabin et al., 2014). In this latter research, metacognitive abilities among individuals with schizophrenia spectrum disorders were negatively associated with symptoms severity and positively associated with psychosocial functioning measures.

Consequently, metacognitive deficits, are linked to impaired social and vocational functions and to social alienation, as such deficits seem to make it difficult for the individual to form social bonds or seek support from others (Lysaker et al., 2010; Roe, 2005). For these reasons, recent conceptualizations of schizophrenia propose that one of the greatest barriers to psychosocial functioning is deficits in metacognition, which limit a person's ability to make sense of their social, psychological and biological challenges (Lysaker & Hasson-Ohayon, 2014; Semerari et al., 2003a). Indeed, metacognition allows individuals to conjecture what others think and feel, permitting them to decide how to effectively respond

to social and psychological difficulties (Lysaker et al., 2013c; Lysaker & Dimaggio, 2014; Lysaker & Hasson-Ohayon, 2014; Semerari et al., 2003a,b).

Some authors suggested that schizophrenia symptoms mediate the association between metacognitive abilities and social quality of life (Frith, 2004). Rabin et al. (2014) demonstrated that negative symptoms in people with schizophrenia mediated the association between understanding others' minds and social quality of life. This approach contrasts intuitive interpretations that propose rather that schizophrenia symptoms influence metacognitive deficits and that these deficits in turn, compromise social quality of life.

An important recent meta-analysis (Arnon-Ribenfeld et al., 2017) indicates other possible explanations for the relationship between symptoms, metacognition and psychosocial functioning. The authors showed that deficits in metacognitive abilities affect psychosocial functioning. Consequently, this association impacts the symptomatology of schizophrenia and so metacognitive abilities help individuals regulate their social behaviour. Therefore, deficits in metacognitive functions may negatively influence interpersonal relationships, resulting in increased symptomatology that may be expressed by a trend towards withdraw (Brune & Brune-Cohrs, 2006; Lysaker et al., 2015b; Salvatore et al., 2008).

In relation to the positive association between metacognition and psychosocial functioning, James and colleagues (2016) showed that this association was independent of symptoms, i.e., metacognitive abilities moderate the association between dysfunctional self-appraisal and social functioning and this relationship persists after controlling for severity of psychopathology. This result agrees with the above meta-analysis (Arnon-Ribenfeld et al., 2017) that states the need to differentiate between symptoms and psychosocial functioning, which correlate with metacognition.

Finally, several authors propose that insight into severe mental disorders, as a form of reflective self-knowledge, is associated with negative implications such as self-stigma, shame, lower sense of meaning, hope and quality of life (Hasson-Ohayon, Kravetz, Roe, David & Weiser, 2006; Hasson-Ohayon, Kravetz, Meir & Rozencwaig, 2009; Hasson-Ohayon, et al., 2012). However, a recent study indicates that metacognition might be a protective factor from the negative implications of insight (Lysaker et al., 2013a). Therefore, it seems important to distinguish between the different protective or side effects each metacognitive ability may have as individuals acquire insight.

2.2 Metacognition and Personality Disorders

The skills to reflect on one's own mental states and on those of others are strongly involved in Personality Disorders (PDs) (Moroni et al., 2016). Semerari et al. (2014) demonstrated that patients with PDs had lower metacognitive abilities than patients without PDs. These deficits were present in each sub-function and persisted even when symptoms were considered as covariates (except for 'monitoring', which was the only function significantly affected by symptoms). Therefore, impairment of metacognitive functions seems to be independent of/from the severity of symptoms. On the other hand, lower metacognitive performance was associated with more personality disorder severity. Indeed, their results showed a strong negative correlation between metacognitive functioning and severity of PD diagnosis. The greater difficulties of PD patients in managing and coping with the demands of everyday life were attributable, at least to some extent, to poorer metacognitive abilities (Semerari et al., 2014).

The authors concluded that metacognitive impairment might be a general dimension of personality disorders, which should be taken into account in the current nosography of diagnostic criteria. The relationship between specific

personality profiles and metacognitive functioning indicates that individual metacognitive deficits could selectively affect the symptomatic expression of personality. Indeed, even with patients with PDs, there may be different metacognitive profiles dependant on different disorders. For example, Moroni et al. (2016) showed that patients with avoidant personality disorder had more difficulties in monitoring and decentering metacognitive functions compared to other PDs. On the other hand, Semerari et al. (2015) demonstrated that Borderline PD patients had more difficulties than patients with other PDs in differentiation and integrating metacognitive functions, even when the severity of psychopathology was controlled. Consistent with previous arguments, other studies on patients with PDs revealed that different profiles of metacognitive impairment corresponded to patients with different personality disorders (Carcione et al., 2011; Dimaggio et al., 2009a; Semerari et al., 2003a, b; 2005; 2007; 2014).

Moreover, a recent study (Lysaker et al., 2017) suggests that metacognitive functioning is affected differentially in different mental disorders. The Borderline PD group showed significantly greater levels of metacognitive capacity than the schizophrenia group and lower levels than the substance use group. Furthermore, Borderline PD group revealed significantly higher levels of self-reflectivity and awareness of others' minds than the schizophrenia group but less mastery and decentering abilities than the substance use group. Finally, the Borderline PD group had significantly higher levels of alexithymia than the substance use group and did not differ from schizophrenia group.

The various domains of metacognition were more closely related in the Schizophrenia group relative to the Borderline PD group. Moreover, this research suggests that metacognitive problems in schizophrenia are of a global nature, while in Borderline PD certain aspects of metacognition are more intact than

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others. In fact, the MAS mean scores of Borderline PD patients indicated that this group were able to describe their own and others' cognitive and affective states and to reflect upon these, but were not able to appreciate others' perspectives (Semerari et al., 2005; 2014; 2015), nor use psychological knowledge to solve interpersonal matters.

Another important issue regarding PDs is that the personality profile seems to play an important role in identifying the risk of violence, both personality features and PDs (Coid, 2002; Fountoulakis, Leucht & Kaprinis, 2008; Reid & Thorne, 2007). The personality disorders most commonly associated with this aspect are anti-social and borderline ones (Howard, Huband, Duggan & Mannion, 2008), also in comorbidity with substance abuse (Fountoulakis et al., 2008).

Bateman & Fonagy (2010) found that patients with BPD had reduced capacity to mentalize, leading to problems with emotional regulation and difficulties in managing impulsivity, especially in the context of interpersonal interactions. This condition is even more evident in conflicting relationships.

Another PD strongly associated with mentalization deficit, which leads to difficulties in managing of social interaction is Antisocial Personality Disorder (APD), which shares certain psychopathological dimensions with BPD (Bateman et al., 2016). In particular, overlap involves strong impulsivity and unpredictability, problems with emotional regulation and controlling anger and behaviour that may be considered manipulative by others (Bateman et al., 2016). The literature clearly shows that patients with APD have a general and deep impairment in metacognitive skills, including deficits in recognising basic emotions (Marsh & Blair, 2008), in social cognition and in the capacity to link mental states to behaviour (Mize & Pettit, 2008; Tolan, Dodge & Rutter, 2013). Furthermore, certain patients with APD show a blend of perspective-taking problems and difficulty in reading others' mental states (Fonagy, 2004; McGauley, Ferris, Marin-Avellan &

Fonagy, 2013; Taubner, White, Zimmermann, Fonagy & Nolte, 2013). This is consistent with the literature's mentalization deficit theory as well as other theories of anti-social behaviour (Blair, 2001; Shamay-Tsoory, Harari, Aharon-Peretz & Levkovitz, 2010). Some studies demonstrated that one pathway to adult anti-social personality develops from early child conduct disorder via alcohol abuse in early adolescence to compromised function of the cognitive control system, of which mentalization is a part (Howard et al., 2008; Howard, 2006). This in turn matures throughout adolescence and into early adulthood.

Many studies have demonstrated the relationship between anger, hostility, impulsivity, and violent behaviour (Birkley & Eckhardt, 2015; Norlander and Eckhardt, 2005; Ramírez & Andreu, 2006; Rubio-Garay, Carrasco, & Amor, 2016). In particular, in Garofalo et al's (2016) study, the group of incarcerated violent offenders reported higher levels of hostility than the community sample. The authors suggest that the tendency to perceive the world as hostile is a feature of a patients' psychological functioning and therefore, may be a strong predictor of violent behaviour.

In general, other research shows that the most frequently involved personality disorders within the context of violence were those belonging to cluster B (Bo et al., 2013; Moran & Hodgins, 2004; Mueser et al., 1997). Data revealed that subjects from forensic and non-forensic settings with a schizophrenia diagnosis in comorbidity had the following PDs: 46.3% antisocial personality disorder, 21.3% narcissistic personality disorder, 17.6% borderline personality disorder, 19.4% paranoid personality disorder, 17.6% avoidant personality disorder. However, only anti-social and borderline personality disorders were positively associated with aggression (Bo et al., 2013).

Although most evidence demonstrates specific associations between Cluster B disorders and violence, some research has reported that a general increase in

personality pathology *per se*, unrelatedly with the particular pathological traits, also increases the risk of both impulsive and premeditated aggression (Nouvion, Cherek, Lane, Tcheremissine & Lieving, 2007; Stanford et al., 2003). Consequently, clearly, personality traits and personality disorders are very important aspects involved with both metacognitive dysfunction and aggressive behaviour. For this reason, the relationship between metacognitive functions, personality profiles and violence will have to be investigated in further studies.

2.3   Metacognition in patients with a history of violence

In patients with schizophrenia and history of violent behaviour, a poor metacognition resulted associated with aggressions (Abu-Akel & Abushua'leh, 2004; Bo, Kongerslev, Dimaggio, Lysaker, & Abu-Akel, 2015; Fonagy & Levinson, 2004). It is very important to consider that premeditated aggression is associated with relatively intact 'cognitive' but severely impaired 'affective' metacognitive functions; in contrast, impulsive aggression was linked to difficulties in both cognitive and affective processing of mental states (Bo et al., 2013; Bo, Abu-Akel, Kongerslev, Haahr & Bateman 2014). Indeed, the relationship between metacognition and violence does not always go in the same direction but may depend on the type of aggressive behaviour (premeditated or impulsive).

Abu-Akel and colleagues (2015) demonstrated that patients with schizophrenia characterised by extreme levels of psychopathy (scoring above 24 on the Psychopathy Checklist—Revised) showed better overall metacognitive abilities compared to patients with schizophrenia without psychopathy; this research indicates that the former represent a specific group in which schizophrenia has a reduced damaging effect on metacognition. Nevertheless, the 'mastery' function (subscale of the Metacognition Assessment Scale) in psychopathic patients was found compromised; this function refers to the skill of using one's own mental

state to solve social and psychological problems. These findings may suggest that the relative conservation of metacognitive functions in patients with schizophrenia characterised by extreme levels of psychopathy could contribute to their violent behaviour as it could allow them to understand how to manipulate their victims (understanding what the victim feels, desires, fears, etc.). In addition, this condition is worsened by the impairment of mastery skills that damage their ability to solve interpersonal matters.

Consequently, the psychological interventions that are specifically targeted at enhancing the capacity of the 'mastery' function in patients with high levels of psychopathy may be effective in dealing with psychological and social problems that lead to frustration and violent behaviour (Abu-Akel et al., 2015).

On the other hand, there is also evidence showing that psychosocial skills such as empathising and understanding the perspective of others are correlated to reduced aggressive behaviour (Abu-Akel & Abushual'eh, 2004; Flight & Forth, 2007; Woodworth & Porter, 2002).

Coherent with the abovementioned study (Abu-Akel et al., 2015), Mitchell and colleagues' research (2012) reported lower mastery scores in forensic patients with schizophrenia compared to patients without history of violence. Data revealed that both groups performed significantly better on 'understanding their own mind' compared to 'understanding others' minds' and 'mastery': even if a small effect size emerged, data indicated higher scores for 'understanding others' minds' compared to 'mastery'. This 'hierarchical' pattern of metacognitive functions is consistent with previous results whereby it is proposed that being able to first recognise one's own mental state will have a strong influence on being able to understand the mental state of others. A hierarchical concept of metacognitive functioning is central in terms of (a) differentiating skills of metacognitive functioning and (b) levels of metacognitive functioning overall in order to offer

appropriate psychological therapies based on individuals' levels of competence (Lysaker, Gumley, & Dimaggio, 2011).

In general, some research has found a poor reflective and metacognitive functioning in violent patients (Abu-Akel & Abushualeh, 2004; Fonagy & Levinson, 2004; Bo et al., 2015).

Another key aspect of metacognitive functioning and the risk of violence concerns child maltreatment. The World Health Organization's definition of child maltreatment (2006) encompasses neglect and negligent treatment, physical and emotional mistreatment, or sexual abuse. Child maltreatment is correlated with the development of conduct disorder (Afifi, McMillan, Asmundson, Pietrzak & Sareen 2011; Jaffee, Harrington, Cohen & Moffitt, 2005) and a heightened potential for violent behaviour (Anda et al., 2006; Caspi et al., 2002; Keenan, Wroblewski, Hipwell, Loeber, & Stouthamer-Loeber, 2010). In particular, many studies have shown that experiences of child maltreatment are connected with an increased level of aggressive behaviour in the maltreated child or adolescent (Chen, Coccaro, Lee & Jacobson, 2012; Taubner, Zimmermann, Ramberg & Schroder, 2016; Weder et al., 2009).

Attachment representations play an important role with regard to aggressiveness: inhibiting aggressive behaviour in the case of secure attachment (Allen et al., 2007) or, in the case of insecure attachment, leading to a vulnerability (van Ijzendoorn, Schuengel & Bakermans-Kranenburg, 1999). In contrast, Taubner and colleagues (2016) found that the effect of child maltreatment on the risk of violence was not mediated by attachment representations. However, a secure attachment relationship promotes the development of good mentalisation abilities (Bateman & Fonagy, 2004): a secure early attachment relationship allows an infant to develop an awareness of their own internal state, from which more complex representations (also concerning others' minds) can then be developed (Choi-Kain

& Gunderson, 2008). It is clear that in a maltreating relationship, the attachment can be damaged and the development of such skills might be highly compromised.

For these reasons, maltreatment appears to be a greater risk for violence both per se and because it compromises the development of metacognitive skills, which in turn are protective factors of/for aggressive behaviour. In fact, consistently with the previous studies, mentalisation abilities could prevent violent and aggressive behaviour (Blair, 1995) and, at the same time, poor or absent mentalisation has been documented to lead to vulnerability and aggressive behaviour (Ha, Sharp & Goodyer, 2011; Taubner et al., 2013).

Emotion recognition is another relevant dimension implicated in aggressive behaviour and metacognitive functions. Indeed, the face's emotional expression and its recognition are very significant cues in social interaction, overall in the conflictual ones. Currently, many studies have demonstrated the association between aggressive behaviour and patients with deficits in emotion recognition. In their meta-analysis, Marsh and Blair (2008) found that individuals who exhibit inappropriate interpersonal and antisocial behaviour have problems in facial emotion recognition, particularly fear and sadness. If a person cannot correctly identify the distress they are causing to another person, they are more likely to continue with the behaviour that is causing the harm. Other studies have come to the same conclusions about specific fear and sadness recognition impairments among antisocial individuals, including adults with psychopathy (Blair, 2004; Glass & Newman, 2006), adolescents with conduct disorder (Fairchild, Van Goozen, Stollery & Goodyer, 2008) and people with mental health problems and history of maltreatment (Leist & Dadds, 2009). Another meta-analysis indicates that a more general facial emotion recognition impairment is evident in psychopathy (Dawel, O'Kearney, McKone & Palermo, 2012). Wegrzyn, Westphal and Kissler (2017) found that violent offenders present with a reliable hostile

attribution bias, in that they rate ambiguous fear-anger expressions as more angry; indeed, there was a lowered threshold to detect anger in violent offenders compared to the general population. Therefore, the hostile attribution bias leads to a characteristic misperception of facial expressions and this mechanism might mediate physical violence. Moreover, emotional recognition could be connected to metacognitive functions, particularly in patients with severe mental disorders (Lysaker et al., 2014c).

To conclude, the evidence in this field is still limited and sometimes contradictory, therefore, future investigations will be necessary to better understand the role of metacognitive functions in the risk of acting violent behaviour by people with severe mental disorders. The present research aims to make a contribution in this direction.

CHAPTER 3

THE METACOGNITION IN THE VIORMED STUDY: A LONGITUDINAL STUDY ON PATIENTS WITH A HISTORY OF VIOLENCE

3.1   Aims and hypotheses

The present study is a sub-project of the 'Violence Risk and Mental Disorders' (VIORMED) project (for further details, see de Girolamo et al., 2016; Barlati et al., submitted). This is a prospective cohort study involving inpatients living in Residential Facilities (RFs) and outpatients of Departments of Mental Health (DMH) in Northern Italy.

The present study aims to investigate metacognitive functions as potential discriminating factors, underneath other clinical characteristics, between people with severe mental disorders who have behaved aggressively and people with the same disorders who have never behaved aggressively.

In particular, the aims of the study are the following.

1.   To investigate the differences between patients with a poor metacognitive functioning and patients with a good metacognitive functioning in relation to history of violence (retrospective phase).

2.   To explore the differences between patients with a poor metacognitive functioning and patients with a good metacognitive functioning in relation to other important aspects potentially involved in aggressive behaviour such as personality traits, anger, impulsiveness, hostility and emotion recognition.

3.   To investigate the differences between patients with a poor metacognitive functioning and patients with a good metacognitive functioning in relation to aggressive behaviour (verbal, physical against object, self-harm, physical against people) displayed by patients during the one year follow-up (prospective phase).

4.   To analyse the predictors of aggressive behaviour and evaluate if the metacognitive functions associated with other investigated aspects (personality traits, anger, impulsiveness, hostility, emotion recognition) are related to aggressive behaviour during the one-year follow-up.

The hypothesis of the study is that impaired metacognitive functions lead to an increased risk of violence in patients with severe mental disorders. In fact, as shown in previous chapters, the ability to understand their own internal states and those of others is crucial to the effective management of relational problems and this can be decisive in avoiding aggressive behaviour against other people: patients with this ability may find a different way to communicate their state of discomfort, and start a dialogue that can also take into account the other's point of view. This adaptive strategy can make possible a peaceful and effective solution. For these considerations, the hypotheses are:

(a)   Patients with a poor metacognitive functioning will report more frequent interpersonal violence in the past compared to patients with a good metacognitive functioning;

(b)   Patients with a poor metacognitive functioning will show more aggressive behaviour during the one-year follow-up compared to patients with a good metacognitive functioning;

(c)   Patients with a poor metacognitive functioning will show: 1) more clinically significant personality traits, 2) more difficulty in emotion recognition, and 3) more levels of hostility, impulsivity and anger compared to patients with a good metacognitive functioning;

(d)   A poor metacognitive functioning added to other important variables such as personality traits, anger, impulsiveness, hostility and emotion recognition will increase the risk of aggressive behaviour during the one-year follow-up.

3.2   Methods

3.2.1 Participants

In the original VIORMED study, 386 patients were recruited and half of them had a history of violence. However, one recruiting centre did not participate in this sub-project on metacognitive functions, therefore 96 patients were not involved. Of the 290 patients included in this study, 98 chose not to participate: indeed, the interview for assessment of metacognition was audio-recorded and this procedure caused them discomfort. The main clinical and sociodemographic features were compared between refusers and compliers: the only differences found regarded the diagnosis and the patients' collaboration. In particular, patients who refused suffered more frequently from schizophrenia compared to patients who accepted (70% vs 47%, p=.002), and were less collaborative in their treatment (84% vs 93%, p=.013). The patients who consented to participate were 192, but 12 were excluded because the interviews were considered invalid, as the interviews contents were not suitable and sufficient for scoring. Therefore, the total sample of this study included 180 patients: 56% outpatients and 44% inpatients. The majority of the sample are male (75%), married (62%), with a medium-low education level (69%), unemployment (71%) and with a mean age of 44 years.

In order to examine the metacognitive functions in relation to the various aspects investigated, including the primary outcome (aggressive behaviour), the patients were split into two groups: patients with poor metacognitive functions (Poor Metacognition group=PM) and patients with good metacognitive functions (Good Metacognition group=GM). The division was based on the Likert scale scores (1=absent; 2=poor; 3=good with help; 4=very good; 5=very good and spontaneous) of the Metacognition Assessment Interview (MAI) and on scores reported by our sample (average range 1.2-3.6). As a result, patients with an

average total score less than 2.5 were classified as PM, while those with an average score equal to or greater than 2.5 were classified as GM.

In the final sample made up of 180 patients, 87 patients belong to the Poor Metacognition group (PM) and 93 to the Good Metacognition group (GM).

Comparing the two groups with regard to social and demographic characteristics, they did not differ in the following aspects: treatment settings (outpatients and inpatients), gender, employment, social contacts, daily activities, family support and patient collaboration on their treatment. On the other hand, patients in the PM group were older and were in education for fewer years compared to those in the GM group (Table 1). Observing the clinical facets, there are no significant differences between the two groups in relation to the diagnosis, the number of compulsory admissions and substance or alcohol use. On the contrary, PM patients showed a longer duration of the disorder and a later contact with the services compared to GM patients. In the symptoms level and in the psychosocial functioning assessments (respectively BPRS and FPS scores), no significant differences emerged between the two groups (Table 2).

Patients with a History of Violence

Ninety-six patients (53%) of the sample have a lifetime history of violence represented by a documented event of physical aggression against other people. The violent event in 70% of cases is physical assault, 7% stalking, 4% attempted murder, and 4% murder. Other cases involve other types of violent acts against people. In addition, 35% of patients had assaulted other people in the 6 months before the violent event. Sixty-five percent of the patients, at the time of the violent act, were already diagnosed with mental disorder and charged of MHSs. In 30% of the cases, despite the violent act, there was no physical damage to the victim; in 50% the wounds were moderate, in 20% there were very severe injuries (also

leading to death). In 45% of the cases the victims were family members, in the other 20% the victims were still close and well-known, of which 7% were healthcare staff. The patients, at the time of the violent act, were under the influence of alcohol in 28% of cases and substances in 13%, while there were psychosis symptoms in 40%. Only 37% of the cases received a definitive sentence (average duration 3 years), which in most cases were spent at Forensic Mental Hospitals. Almost half of the patients (40%) with a history of violence also showed self-harm and/or suicidal behaviour.

Table 1. Differences in sociodemographic characteristics between PM and GM patients

	PM (N=87)	GM (N=93)	Test*	p-value
Age				
Mean (SD)	46.67 (10.2)	41.01 (9.36)	F=15.34	**<.001**
Gender				
Male (%)	69 (79.3)	66 (71.0)	X^2= 1.67	.196
Female(%)	18 (20.7)	27 (29.0)		
Setting				
Outpatients (%)	47 (54.0)	54 (58.1)	X^2= .3	.585
Inpatients (%)	40 (46.0)	39 (41.9)		
Marital status				
Single (%)	33 (37.9)	36 (38.7)	X^2= .012	.914
Married or cohabitating (%)	54 (62.1)	57 (61.3)		
Education				
Low (%)	67 (77.0)	57 (61.3)	X^2= 5.18	**.023**
Medium-high (%)	20 (23.0)	36 (38.7)		
Employment				
Employed (%)	24 (27.6)	27 (29.7)	X^2= .10	.759
Unemployed (%)	63 (72.4)	64 (70.3)		
Cohabiting				
Alone (%)	26 (33.8)	19 (23.8)	X^2= 5.53	.063
Family (%)	43 (55.8)	58 (72.5)		
Others (%)	8 (10.4)	3 (3.8)		
Frequent social contacts				
Yes (%)	77 (80.2)	65 (78.3)	X^2= .097	.755
No (%)	19 (19.8)	18 (21.7)		
Time spent doing nothing				
Up to 3 hours a day (%)	32 (36.8)	43 (47.3)	X^2= 2	.157
More than 3 hours a day (%)	55 (63.2)	48 (52.7)		
Family support				
Present (%)	58 (69.9)	68 (78.2)	X^2= 1.52	.218
Absent (%)	25 (30.1)	19 (21.8)		
Treatment collaboration				
Collaborative (%)	78 (90.7)	88 (96.7)	X^2= 2.74	.098
Not collaborative (%)	8 (9.3)	3 (3.3)		

*Chi-square test for the categorical variables and ANOVA for quantitative variables

Table 2. Differences in clinical characteristics between PM patients and GM patients

	PM (N=87)	GM (N=93)	Test	p-value*
Disorder duration in years (M,SD)	20.9 (10.09)	16.58 (9.22)	F=5.88	**.016**
Age of the first contact with services (M,SD)	30.17 (11.9)	26.78 (8.44)	F=5.18	**.024**
Lifetime compulsory admissions				
None (%)	41 (54.7)	46 (56.1)	F= 3.44	.173
1 – 3 (%)	27 (36.0)	34 (41.5)		
>= 4 (%)	7 (9.3)	2 (2.4)		
Primary psychiatric diagnosis defined by the clinician				
Schizophrenia (%)	38 (43.7)	41 (44.1)	X^2= 1.58	.664
Personality disorders (%)	29 (33.3)	26 (28.0)		
Bipolar disordes (%)	9 (10.3)	15 (16.1)		
Anxiety and mood disorders (%)	11 (12.6)	11 (11.8)		
Personality disorders defined by SCID II				
Cluster A (%)	15 (20.3)	13 (16.5)	F=4.37	.386
Cluster B (%)	32 (43.2)	29 (36.7)		
Cluster C (%)	2 (2.7)	5 (6.3)		
Other (%)	10 (13.5)	7 (8.9)		
None (%)	15 (20.3)	25 (31.06)		
Lifetime substance abuse				
No (%)	55 (65.5)	46 (53.5)	X^2= 2.53	.112
Yes (%)	29 (34.5)	40 (46.5)		
Lifetime alcohol abuse				
No (%)	50 (58.1)	56 (62.2)	X^2= 0.31	.580
Yes (%)	36 (41.9)	34 (37.8)		
BPRS				
BPRS_Tot	41.9(16.4)	38.1 (11.8)	U=-1.18	.237
BPRS_Anxiety- Depression	8.0 (3.6)	7.9 (3.5)	U=-.30	.763
BPRS_Hostility- Suspicion	6.1 (3.2)	5.2 (2.4)	U=-1.59	.111
BPRS_ Thinking disorders	7.4 (4.7)	6.6 (3.1)	U=-.53	.596
BPRS_ Withdrawal	6.4 (3.5)	5.8 (2.4)	U=-.91	.365
BPRS_ Activation	4.3(2.1)	4.0 (1.6)	U=-.71	.480
FPS	54.9 (16.6)	57.1 (17.6)	F=.75	.387

*Chi-square test or Fisher' Exact test for the categorical variables and ANOVA for quantitative variables or Mann Whitney-test for continuous non-normal variables.

3.2.2 Measures

Clinical assessment

A Patient Schedule was used to collect information about sociodemographic characteristics, social relationships, leisure activities, socioeconomic status, clinical and treatment-related features. A specific section (only for violent patients) concerning their history of violence was filled out for each patient.

The Structured Clinical Interview for DSM-IV for Axis I (SCID-I) and Axis II (SCID-II) are semi-structured interviews based on the DSM-IV criteria and were used to confirm standardised clinical diagnoses (First, Gibbon, Spitzer, Williams, Benjamin, 1997; First, Spitzer, Gibbon & Williams, 2002). These instruments are two very complex interviews that investigate every criterion of every disorder included in the DSM-IV and last approximately 2 hours each. Cohen's Kappa indices vary from .61 to .83 for SCID-I and .77 to .94 for SCID-II, therefore they display good concordance (Lobbestael, Leurgans & Arntz, 2011).

Psychopathology was assessed by the Brief Psychiatric Rating Scale (BPRS) (Ventura, Green, Shaner & Liberman, 1993), which is a rating scale to measure psychiatric symptoms: each symptom is rated 1-7 (the highest scores correspond to very severe symptoms) and a total of 24 symptoms are scored. Cronbach's α for the five scales utilised in the current study were as follows: Thinking Disorder .65, Withdrawal .61, Anxiety-Depression .68, Hostility-Suspicion .47, and Activation .64 (Burger, Calsyn, Morse, Klinkenberg & Trusty 1997).

Psychosocial functioning was evaluated by the Personal and Social Performance (PSP) scale, a modified version of the DSM-IV Social and Occupational Functioning Assessment Scale (SOFAS) (Morosini, Magliano, Brambilla, Ugolini & Pioli 2000). The scale consists of a single score that ranges from 0 to 100 and the highest number indicates the best functioning. The

psychometric indices are very good: the Interclass Correlation Coefficient (ICC) is .94, and Cohen's Kappa is .98 (Nasrallah, Morosini & Gagnon, 2008).

Metacognition assessment

The Metacognition Assessment Interview (MAI) is a semi-structured interview aimed at investigating metacognitive functions according to the theoretical construct described in the first chapter. The ICC for Monitoring facets ranges from .54 to .69; for Differentiating facets from .44 to .76; for Integrating facets from .59 to .64; and for Decetring facets from .41 to .57. Cronbach's α for the global scale is .91 (Semerari et al., 2012).

The interview begins with an open question asking the patient to describe a relational negative autobiographical episode (conflicting and/or source of discomfort) which had occurred in the last 6 months. In order to evaluate the patient's comprehension in relation to the others' mental state, the episode has to include an interaction with another person. The worst episode of the last six months was investigated to be able to evaluate metacognitive functions in critical circumstances. After the patient reports the episode, the interviewer sets out predefined questions that sequentially investigate 4 metacognitive (sub)functions: monitoring, differentiating, integrating and decentring.

Each of these functions is evaluated by four specifiers (related to the questions), to which a score from 1 to 5 is assigned (the higher score indicates more functionality), therefore each function will have a score between 4 and 20, and the total score of the 4 (sub)functions indicates the general metacognitive functioning and ranges from 16 to 80.

Aggressiveness, impulsivity and hostility assessment

Aggression and impulsivity were evaluated using the following self-report instruments.

The Buss-Durkee Hostility Inventory (BDHI) is a 75-item true/false questionnaire developed to assess 8 subscales related to hostility, resentment and negative affect: Cronbach α was .822 (*p*=.001), (Buss & Durkee, 1957). The 8 subscales are: Assault, Indirect aggression, Irritability, Negativism, Resentment, Suspicion, Verbal aggression and Guilt.

The Barratt Impulsiveness Scale (BIS-11) is a 30-item, 4-point Likert scale questionnaire on personality and behavioural impulsiveness, with scores ranging from 30 to 120 (Barratt, 1965; Patton, Stanford & Barratt 1995): in the Italian validation Cronbach's α for internal consistency is .79 (Fossati, Di Ceglie, Acquarini & Barratt, 2001). This includes 3 subscales: Cognitive impulsiveness, Motor impulsiveness and Non-planning impulsiveness.

The State-Trait Anger Expression Inventory 2 (STAXI-2) is a self-report questionnaire which includes 11 subscales plus an Anger Expression Index, as an overall measure of total anger expression (Spielberger et al., 1985; Italian validation Comunian, 2004). The subscales are: State anger, Feeling angry, Feel like expressing anger verbally, Feel like expressing anger physically, Trait anger, Angry temperament, Angry reaction, Anger expression-out, Anger expression-in, Anger control-out and Anger control-in. Good internal consistency for the scale is reported in both normal adults (α=.84 to .86) and psychiatric patients (α=.87) (Spielberger, 1999).

Personality assessment

The Millon Clinical Multiaxial Inventory – III (MCMI-III) is a self-report designed to assess personality profile. It is made up of 175 true-false items and has

14 personality disorder scales, 10 clinical syndrome scales, and 4 correctional scales (Millon, Davis & Millon, 1997). The study focused on the fourteen personality disorder scales, including Schizoid, Avoidant, Depressive, Dependent, Histrionic, Narcissistic, Antisocial, Sadistic, Compulsive, Negativistic, Masochistic, Schizotypal, Borderline and Paranoid scales. These scales assess clinical areas according to DSM-IV diagnostic criteria for PD: higher scores indicate higher levels of psychopathology.

The MCMI-III uses a Base Rate (BR) transformation score for raw score conversion. This is a distribution that takes into account the prevalence rate to maximise diagnostic efficacy (Gibertini, Brandenburg & Retzlaff, 1986; Meehl & Rosen, 1955). A BR >84 indicates that the patient endorses all symptoms at diagnostic level, so full-blown PD is possible; BR scores from 75 to 84 suggest the presence of clinically significant traits and sub-threshold symptoms; BR scores < 75 are generally considered not clinically relevant. For the aims of the study, all patients reporting scores ≥ 75 BR were considered as endorsing clinically significant personality traits. The internal consistency for personality scales is good: Cronbach's α for clinical personality patterns rages from .77 to .89, for severe personality pathology from .84 to .85 (Millon et al., 1997); in the Italian validation Cronbach's α goes from .66 to .95 (Zennaro et al., 2008). The MCM-III is one of the most important measures, among the self-report instruments, for the assessment of clinically significant personality traits and personality disorders.

Emotion recognition assessment

The Facial Expressed Emotion Labelling (FEEL) test is a reliable and valid tool for measuring the ability to recognise facially expressed emotions. Cronbach's α for internal consistency is .77 (Kessler, Bayerl, Deighton, & Traue, 2002). This is a performance test. Pictures of 6 different emotions (Anger, Fear, Sadness,

Happiness, Surprise and Disgust) are presented on screen for 300ms. Expressions were taken from the JACFEE (Japanese and Caucasian Facial Expressions of Emotion; Matsumoto & Ekman, 1988) series. Patients read the instructions on the monitor. The practice trial was as follows: a neutral face was shown for 1.5s followed by 1s blank screen and the facial test expression. Six words (Anger, Anxiety, Surprise, Sadness, Happiness and Disgust) were presented with the face and one had to be chosen by clicking on it (forced-choice response format). Response time was limited to 10sec. This was followed by a written feedback about the correctness of the answer. Every one of the six basic emotion expressions was presented in this learning trial. Each participant then had the possibility to ask questions about the procedure. During the actual testing, the procedure was the same except for the feedback, that was not allowed.

Each emotion was shown 7 times in different faces (half Caucasian and European, half females and males) in randomised order. In total, 42 pictures were shown (seven examples of all six emotions used), resulting in a maximum score of seven points in each emotional category and a maximum total score of the FEEL-Test of 42 points.

Longitudinal monitoring of violent behaviour

During the one-year follow-up, every two weeks the researcher questioned the treating clinician or the caregiver and filled out the Modified Overt Aggression Scale (MOAS; Kay, Wolkenfeld & Murrill, 1988) for each patient involved in the study. The MOAS includes the following 4 subscales of aggression: Verbal, Physical, Against objectives and Self-harm behaviour. A score from 0 to 4 is assigned to each act, where 0 indicates no aggression and 4 denotes very severe aggression. In each subscale, the score is multiplied by a factor specific for the category, i.e. 1 for verbal aggression, 2 for aggression against objects, 3 for

aggression against self and 4 for aggression against other people. Therefore, the total weighted score ranges from 0 (no aggression) to 40 (maximum grade of aggression). We will subsequently refer to the weighted MOAS score simply as the MOAS score. In the Italian validation (Margari et al., 2005), the ICC and Pearson's r coefficients are all higher than 0.9, suggesting an almost perfect concordance in rating, and weighted Cohen's Kappa indices were also very high: .93 for verbal, property and physical aggression and .99 for self-aggression.

All the assessment tools were selected on the basis of: extensive use in literature, interest in specific constructs of each instrument (according to the aims) and good psychometric properties.

3.2.3 Procedures

Treating clinicians selected all patients with a history of severe interpersonal violence, as shown by one or more of the following criteria: (i) admitted at least once to a Forensic Mental Hospital (FMH) for any violent acts against other people; (ii) arrested at least once for any violent acts against other people; (iii) having a documented lifetime history of violent acts against other people (as reported in the official clinical records). A group of patients with no history of violence, similar in age, gender and primary diagnosis (including the co-morbidity with substance or alcohol use disorders) was recruited.

Exclusion criteria were as follows: being older than 65 years and having a primary diagnosis of organic mental disorder. The study was approved by the ethics committee of the coordinating centre (IRCCS Saint John of God Fatebenefratelli Clinical Research Centre) and the ethics committees of all the other recruiting centres.

After selection by the treating clinicians, each patient was contacted by the researcher for an in-depth explanation of the project and signature of informed

consent. Patients then received subsequent appointments for the administration of all the instruments. In particular, for the Metacognitive Assessment Interview, patients signed a separate consent, because the interview was audio recorded in order to calculate the scoring. Each assessment session lasted 60-90 minutes.

All researchers attended an initial training related to the proper administration of the instruments used in the project. All self-report instruments were filled out with the attendance of a researcher available to explain each item and assist patients if necessary.

In the longitudinal phase of the study regarding the monitoring of aggressive behaviours through the fill-out of the MOAS, researchers contacted the patient's treating clinician or his/her caregiver every fifteen days.

At the end of each patient's assessment, researchers filled out an online database, built specifically for the project, with predefined variables, in order to ensure homogeneity and minimise errors in data collection.

3.2.4 Statistical analysis

When the two groups, PM patients and GM patients, were compared in relation to categorical variables (sociodemographic and clinical characteristics or the history of violence) the Chi-Square test (or Fisher Exact test if there were cells with a number less than 5) was used to analyse the differences between groups in certain categories. Instead, when the two groups were confronted about quantitative variables (i.e. quantitative sociodemographic and clinical characteristics, BIS-11 and BDHI) the Analysis of Variance (ANOVA) was performed to analyse the differences in the means (and standard deviations) between the two groups.

The distribution of data for each variable was evaluated and if the distribution was not normal (i.e. FEEL, MCMI-III, STAXI-2 and MOAS), the Mann-Whitney non-parametric test was utilised.

Monitoring of violent behaviour was performed by analysing the MOAS total score and MOAS subscales across the 24 time-points during follow-up through smoothing-splines for trend estimation (Ramsay & Silverman, 2005).

Predictors of aggressive behaviour were tested by performing Generalized Linear Models (GLMs, with tweedie distribution and log-link function); the MOAS total score was entered as the dependent variable and continuous and categorical measures, as well as interaction between metacognitive group and predictors, included as independent variables.

In order to investigate whether the sociodemographic and clinical variables which differed between two groups (PM and GM), i.e. 'age', 'education level', 'disorder duration', 'age of the first contact with services', influence results, correlations between these variables and outcomes of all the measures (FEEL, MCMI-III, BDHI, BIS-11, STAXI-2, MOAS) were carried out (see Appendix 2). When correlations between outcomes and one or more the abovementioned variables were present, the analyses were corrected using them as covariates (ANCOVA for variable with normal distribution and GLMs for variable without normal distribution and for predictive models) that also included the correlated variables. Data showed that even after the adjustment of values, the presence or absence of statistical significance of all the results was not altered by the Age, Education level, Disorder duration and Age of the first contact with services variables, which were therefore not confounding factors. For further details, see Appendix 2.

All tests were two-tailed, with the statistically significant level set at $p =< .05$. All data was coded and analysed using the Statistical Package for Social Science

(SPSS, version 23) and R: A language and environment for statistical computing, (R Core Team, 2015).

3.3 Results

3.3.1 Metacognition and history of violence

PM patients reported a history of violence more frequently than GM patients (considering the MAI total score). Therefore, the differences in specific metacognitive functions, assessed with the MAI, were analysed.

Consequently, the sample was again split based on the levels (Poor Metacognition=<2.5 or Good Metacognition=>2.5) of the 4 specific metacognitive functions and the presence of patients with a history of violence in the two groups was compared for each function.

As Table 4 shows, the patients with a poor level of metacognition in monitoring, differentiating and decentring displayed a history of violence more frequently than patients with a good level of metacognition in the same functions.

Table 4. Differences in metacognitive functions between patients with and without history of violence

History of violence	PM N(%)	GM N(%)	X^2	*p-value*
Total Matacognition				
Yes	58 (66.7)	38 (40.9)	12.03	**.001**
No	29 (33.3)	55 (59.1)		
Monitoring				
Yes	30 (68.2)	66 (48.5)	5.16	**.023**
No	14 (31.8)	70 (51.5)		
Differentiating				
Yes	52 (65.0)	44 (44.0)	7.88	**.005**
No	28 (35.0)	56 (56.0)		
Integrating				
Yes	50 (60.2)	46 (47.4)	2.95	.086
No	33 (39.8)	51 (52.6)		
Decentring				
Yes	60 (65.9)	36 (40.4)	11.74	**.001**
No	31 (34.1)	53 (59.6)		

* The Chi-square test

3.3.2 Metacognition and emotion recognition

In the skill of emotional recognition through face expression, assessed with FEEL, PM patients reported lower total scores than GM patients. In particular, the PM group showed worse performances in recognising the following emotions: anger, sadness, and joy (Table 5).

Table 5. Differences in emotion recognition between PM patients and GM patients

Facially Expressed Emotion Labeling test (FEEL)	PM M(SD)	GM M(SD)	U*	*p-value*
TOT.	30.4 (6.0)	33.5 (5.9)	4603.5	**.011****
Sadness	4.7 (1.8)	5.7 (1.7)	4617	**.013*°**
Anger	3.8 (2.1)	4.6 (2.1)	4191.5	**.014**
Disgust	5.2 (1.7)	5.6 (1.8)	3961	.808°*
Fear	4.6 (2.0)	5.0 (1.9)	3880.5	.472°
Joy	6.4 (0.8)	6.6 (0.8)	3966	**.039**
Surprise	5.7 (1.5)	5.9 (1.5)	3835.5	.179

*The Non-Parametric U-Mann-Whitney test
*°Adjusted values for 'Age' and 'Disorder Duration' through GLMs
°*Adjusted values for 'Disorder Duration' through GLMs
°Adjusted values for 'Age' through GLMs
**Adjusted values for 'Age' and 'Disorder Duration' through GLMs

3.3.3 Metacognition and personality traits

As far as personality traits are concerned, PM patients showed higher scores than GM patients in the Narcissistic and Paranoid scales (Table 6). Furthermore, to evaluate only the clinically significant traits, the presence of patients who exceeded the cut-off of 75 BR (indicating clinically significant traits) was compared between the two groups: PM patients reported clinically significant Narcissistic and Paranoid traits more frequently than GM patients (Narcissistic: 33% of PM group vs 18% of GM group; X^2=5.040, *p*=.029; Paranoid: 23% of PM group vs 16% of GM group; X^2=3.067, *p*=.055). In all PD subscales no differences were found (*p*>.05) .

Table 6. Differences in personality traits between PM patients and GM patients

MCMI-III	PM M(DS)	GM M(DS)	U*	*p-value*
Schizoid	54.4 (20.1)	57.2 (25.1)	3.407	.375
Avoidant	51.1 (28.7)	54.1 (28.5)	3.390,5	.406
Depressive	47.3 (28.6)	50.9 (29.1)	3.421	.350
Dependent	50.1 (29.5)	51.8 (27.7)	3.213	.828
Histrionic	60.8 (24.8)	54.6 (24.9)	2.786,5	.210
Narcissistic	65.0 (23.4)	57.3 (21.5)	2.580,5	**.049**
Antisocial	55.2 (20.9)	54.7 (19.8)	3.134	.956
Sadistic	45.6 (20.0)	43.6 (21.1)	2.969,5	.533
Compulsive	76.5 (26.1)	71.6 (27.2)	2.817,5	.251
Negativistic (Passive-aggressive)	54.6 (23.8)	51.2 (29.8)	3.012	.634
Masochistic (Self-Defeating)	38.5 (24.2)	38.5 (24.7)	3.087,5	.829
Schizotypal	47.7 (27.2)	47.5 (26.3)	3.085	.822
Borderline	47.8 (32.3)	50.5 (28.9)	3.321,5	.554
Paranoid	62.8 (23.3)	55.3 (25.5)	2.396	**.009**

*The Non-Parametric U-Mann-Whitney Test

3.3.4 Metacognition, anger, impulsivity and hostility

With regard to the evaluation of hostility, impulsivity and anger (assessed respectively by means of the BDHI, BIS-11 and STAXI-2) in relation to metacognitive functions, there were no significant differences between the two groups, except for the Negativism subscale of the BDHI instrument. In this case, the PM group (M=3.1) showed higher scores than the GM group (M=2.6) (*p*=.03, see Tables 8, 9 and 10).

Table 8. Differences in hostility between PM patients and GM patients

BDHI	PM M(DS)	GM M(DS)	F*	p-value*
Assault	4.0 (2.3)	3.6 (2.2)	9.250	.587**
Indirect aggression	4.5 (2.0)	4.6 (2.0)	.119	.730
Irritability	4.4 (2.7)	4.2 (2.5)	.220	.639
Negativism	3.1 (1.5)	2.6 (1.4)	4.780	**.030**
Resentment	3.4 (2.1)	3.5 (2.0)	.037	.849
Suspicion	4.5 (2.4)	4.2 (2.6)	.635	.991*°
Verbal aggression	6.8 (2.5)	6.4 (2.5)	1.421	.235
Guilt	5.0 (2.2)	4.9 (2.4)	.088	.767
Total score	33.0 (12.0)	31.7 (11.9)	.453	.502

* The ANOVA

**Adjusted values for 'Education Level' through ANCOVA

*°Adjusted values for 'Disorder Duration' through ANCOVA

Table 9. Differences in impulsiveness between PM patients and GM patients

BIS-11	PM M(DS)	GM M(DS)	F*	p-value
Cognitive impulsiveness	15.3 (4.5)	15.3 (4.1)	0.001	.971
Motor impulsiveness	22.6 (4.9)	21.8 (4.9)	1.339	.249
Non planning impulsiveness	27.2 (5.1)	27.6 (5.0)	.270	.604
Totale	65.1 (11.4)	64.5 (11.6)	.144	.705

* The ANOVA

Table 10. Differences in anger between PM patients and GM patients

STAXI-2	PM M(DS)	GM M(DS)	U*	p-value
State anger	18.6 (6.9)	18.1 (6.4)	3568.5	.167**
Feeling angry	6.5 (2.5)	6.4 (2.6)	3537	.429**
Feel like expressing anger verbally	6.4 (2.9)	6.2 (2.9)	3682	.712
Feel like expressing anger physically	5.7 (2.2)	5.5 (1.7)	3888	.924
Trait anger	17.6 (7.0)	18.2 (6.5)	4077.5	.716*°
Angry temperament	6.4 (2.7)	6.9 (2.7)	4248	.946*°
Angry reaction	7.7 (3.4)	7.9 (3.1)	4167	.371
Anger expression-out	15.1 (5.5)	13.9 (4.6)	3379	.184
Anger expression-in	17.5 (5.5)	17.3 (5.3)	3653	.796
Anger control-out	20.0 (4.9)	20.5 (5.2)	4016.5	.475
Anger control-in	21.9 (5.7)	22.7 (5.3)	4038	.356
Anger expression Index	38.3 (14.7)	35.7 (15.3)	3143	.276

*The Non-Parametric U-Mann-Whitney Test

**Adjusted values for 'Age' through GLMs

*°Adjusted values for 'Age' and 'Disorder Duration' through GLMs

3.3.5 Metacognition and aggressive behaviour during one-year follow-up

When comparing aggressive behaviour observed during the one-year follow-up, no significant differences emerged between PM and GM groups in the average MOAS scores, in both the total scores and the 4 subscales scores, related to the different types of aggressiveness: Verbal, Against objects, Self-aggression and Against people (Table 11).

Furthermore, in order to identify the most aggressive patients, the presence of individuals with a total MOAS>16 (third quartile) in the two groups (PM and GM) was compared, and also in this case significant difference between PM patients and GM patients did not emerge (PM=24% vs GM=27%, X^2=.216, p= .730).

Table 11. Differences in aggressive behaviour during one-year follow-up

between PM patients and GM patients

MOAS Aggressive behaviours	PM Mean (SD)	GM Mean(SD)	Test	*p-value
Verbal	5.6 (9.8)	5.4 (8.6)	3837.5	.226*°
Against objects	2.7 (8.0)	2.9 (5.5)	4094.5	.505*°
Self-aggression	1.5 (6.7)	2.2 (7.7)	3907	.637
Against people	2.6 (6.6)	4.7 (13.9)	3986	.418**
TOT.	12.5 (24.2)	15.2 (27.6)	4102.5	.905*°

*The Non-Parametric U-Mann-Whitney Test
**Adjusted values for 'Age' through GLMs
*°Adjusted values for 'Age' and 'Disorder Duration' through GLMs

The trend of the 24 evaluations (over 12 months) of aggressive behaviour in the two groups was analysed: significant differences were not found. The confidence bands (grey bands) of the two groups in all the figures overlap and this indicates that the trends of the two groups did not differ (Figure 1). These analyses were conducted on the total score (figure 1) and on 4 subscales: verbal (figure 2), against objects (figure 3), self-aggression (figure 4), against people (figure 5). The

figure shows that the trends of the two groups were both very fluctuating and irregular during the entire follow-up period.

Figure 1. Trends of the MOAS total scores during one-year follow-up in PM and GM patients
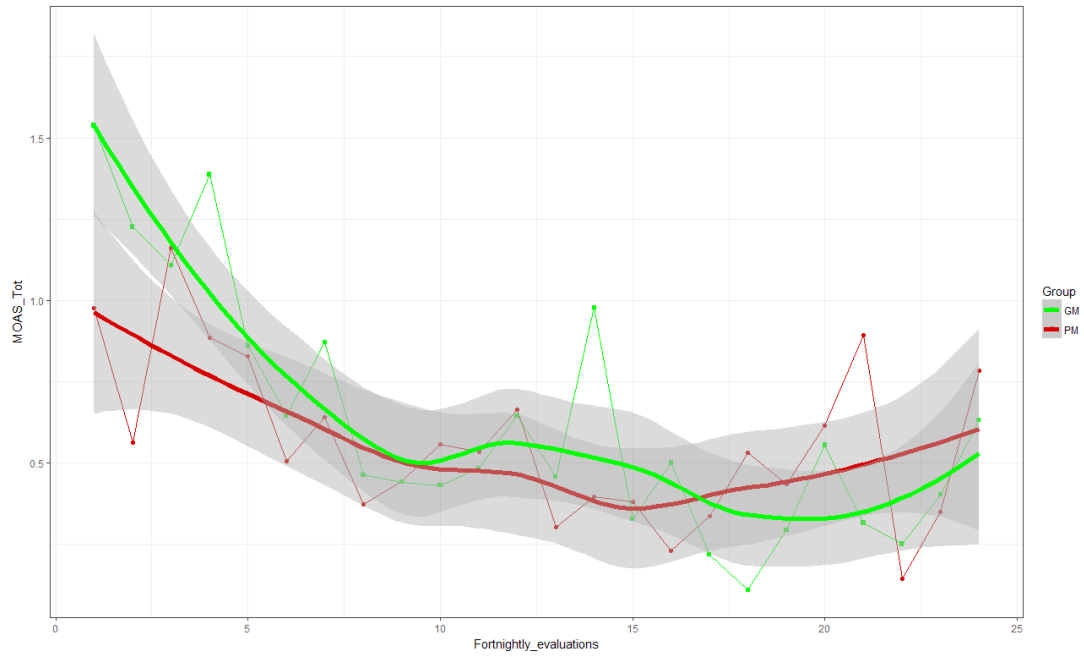
Figure 2. Trends of the MOAS verbal aggression scores during 1-year f.u. in the PM patients and GM patients
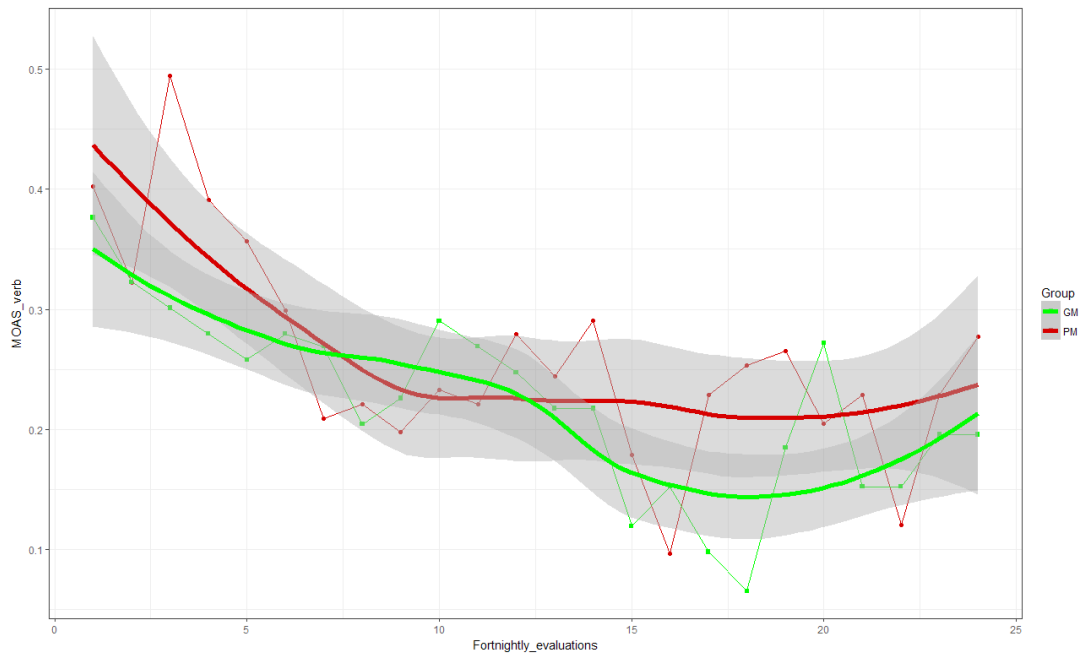

Figure 3. Trends of the MOAS aggression against objects scores during 1-year f.u. in the PM patients and GM patients
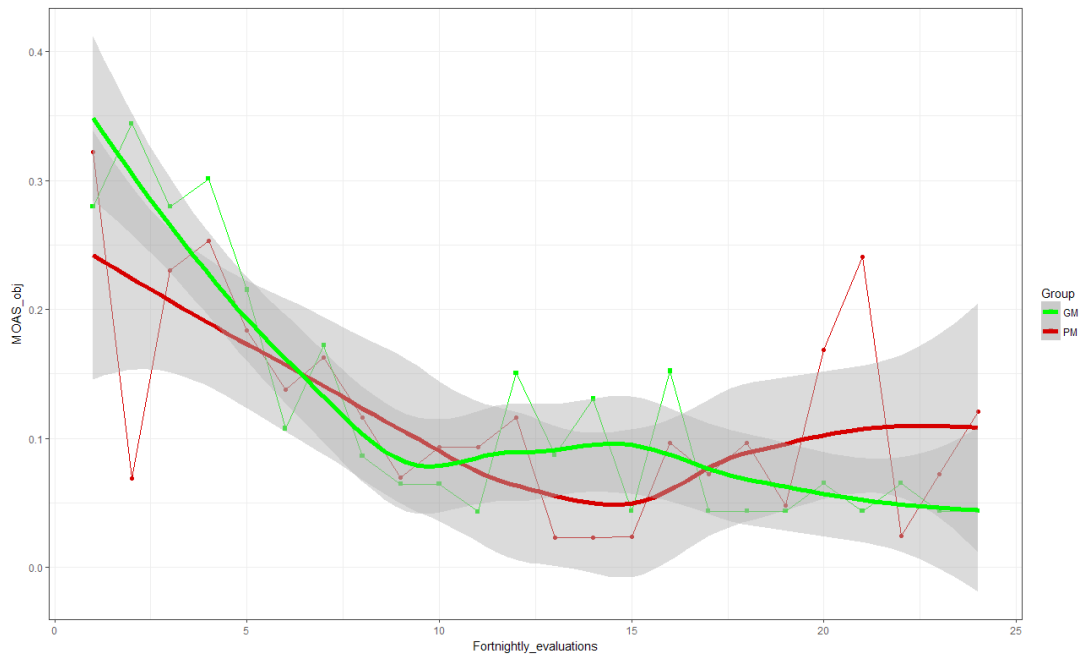
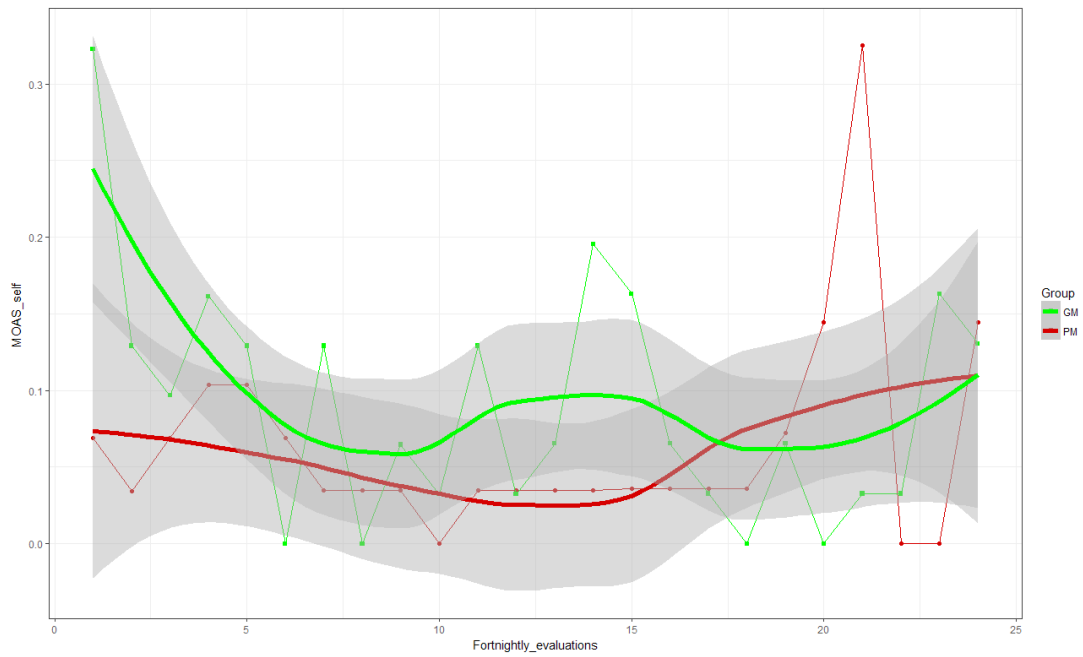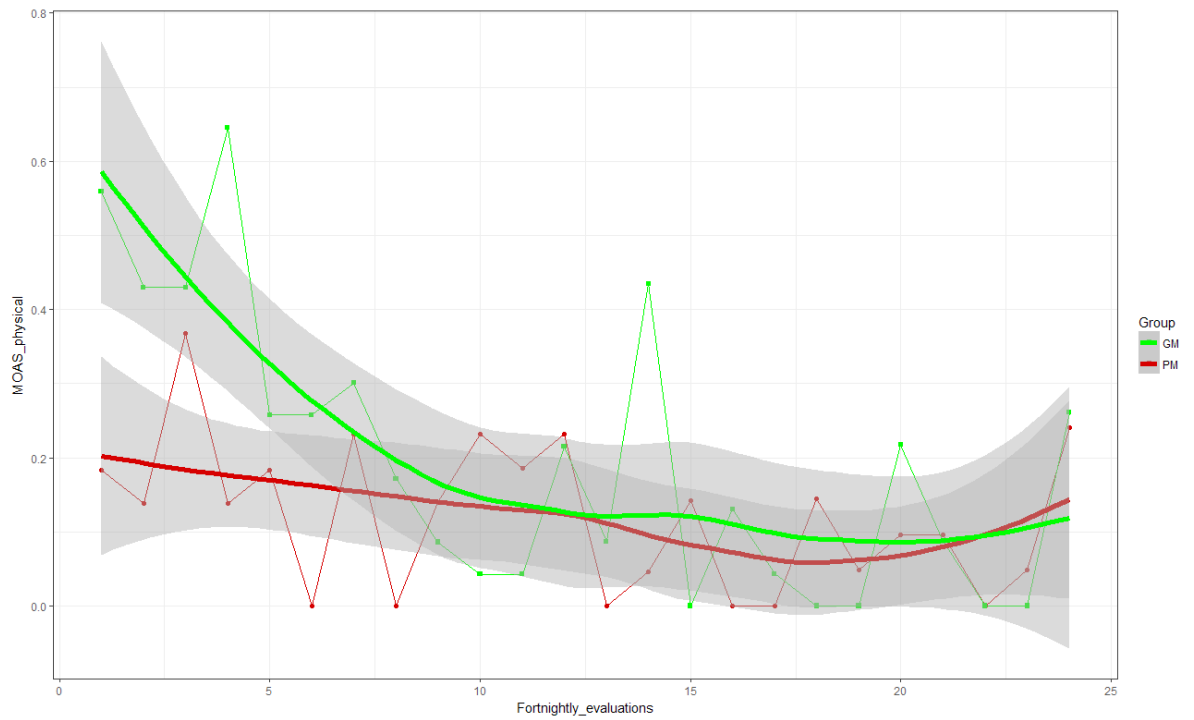**Figure 4. Trends of the MOAS self-aggression scores during 1-year f.u. in the PM patients and GM patients**

Figure 5. Trends of the MOAS aggression against people scores during 1-year f.u. in the PM patients and GM patients

3.3.6 Predictors of aggressive behaviour and the role of the metacognitive functions

In order to assess whether there is any predictive factor of the aggressive behaviour displayed during the follow-up by the patients, the dimensions evaluated in this study were analysed using GLM: metacognition, history of violence, care setting, psychopathology, anger, hostility, impulsivity, emotion recognition and personality traits. These analyses indicate that with the growth of one unit (score) of the quantitative variables, or with the presence (or absence) of the categorical variables, the mean increment (or decrease) of the MOAS mean total score (13.94) is equal to $\exp(\beta)$. Therefore, in this paragraph, the MOAS score refers to the MOAS mean total score.

Data showed that the significant predictive variables of aggressive behaviour (MOAS scores) were the following (Table 12). The strongest predictors were Borderline and Passive-Aggressive (Negativistic) personality traits; in particular, the presence of these traits forecast a mean increase of the MOAS score, respectively, of 211% ($\exp(\beta)$=2.11) and 92% ($\exp(\beta)$=1.92). Meanwhile, Compulsive and Histrionic traits were related to a mean decrease of the MOAS score respectively of 42% ($\exp(\beta)$=0.58) and 43% ($\exp(\beta)$=0.57).

Similarly, the history of violence was a very important predictor: the presence of a history of violence led to a mean increase of the MOAS score by 86% ($\exp(\beta)$=1.86).

The BDHI total score and all its subscales, except for Guilt, resulted as predictive factors. With the unit rise of these subscales, the MOAS score's mean increases are: 5% for Total Score ($\exp(\beta)$=1.05); 17% for Assault ($\exp(\beta)$=1.17); 28% for Indirect aggression ($\exp(\beta)$=1.28); 25% for Irritability ($\exp(\beta)$=1.25); 17% for Negativism ($\exp(\beta)$=1.17); 22% for Resentment ($\exp(\beta)$=1.22); 22% for Suspicion ($\exp(\beta)$=1.22); and 20% for Verbal aggression ($\exp(\beta)$=1.20).

Also, the Hostility-Suspicion subscale of the BPRS is a predictive factor: the unit rise of this scale produces a mean increase of the MOAS score by 12% (exp(β)=1.12).

Regarding emotion recognition by facial expressions, the unit increment of fear recognition in the FEEL test corresponded to a mean decrease by 11% (exp(β)=0.89) in the MOAS score.

Finally, several subscales of the STAXI-2 were predictive dimensions of aggressive behaviour. Data showed that unit growth in the following subscales corresponded to mean increases of the MOAS score, specifically: 7% for Trait anger (exp(β)=1.07); 11% for Angry reaction (exp(β)=1.11); 19% for Angry temperament (exp(β)=1.19); and 6% for Anger expression-out (exp(β)=1.06).

The metacognition alone did not emerge as a predictive factor of aggressive behaviour. Nevertheless, the potential role of metacognitive functions to predict aggressive behaviour was evaluated through the analysis of the interaction between these functions (considering both the GM group and the PM group) and all the aspects assessed in this study. Metacognitive functions displayed a significant interaction with the following variables: BDHI-Assault, BDHI-Indirect aggression and STAXI-2-Anger reaction (Table 13). Through a more in-depth analysis aimed at understanding the qualitative and quantitative aspects of this interaction in predicting aggressive behaviour, the beta coefficients for the two metacognitive groups (PM and GM) were calculated separately (Table 14). The data showed a very important result: the abovementioned variables that interacted with metacognition emerged as significant predictors of aggressive behaviour only for patients with poor metacognition. Indeed, in PM patients the unitincrement in the scores of BDHI-Assault, BDHI-Indirect aggression and STAXI-2-Anger reaction led to a mean increase of the MOAS total score (12.49), respectively, by 36% (exp(β)=1.36), 53% (exp(β)=1.53) and 21% (exp(β)=1.21). Conversely, these

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variables did not predict aggressive behaviour in patients with good metacognition. In the cases of two dimensions of the BDHI, the adjustment analyses for the Age and Disorder duration variables (which differed in the two groups and when correlated with MOAS scores) showed that, despite the interaction of metacognitive functions with the two dimensions of BDHI in predicting aggressive behaviour not being influenced by above variables since the interaction remains significant, Age was a significant variable, therefore it plays a role in the prediction of aggressive behaviour. For further details, see Appendix 2.

Table 12. Predictive factors of aggressive behaviour during one-year follow-up

	p-value	**exp(β)**
MAI *(PM vs GM)*	.376	.82
History of violence *(Yes vs No)*	**.006**	1.86
BDHI		
Total Score	**<.001**	1.05
Assault	**.003**	1.17
Inderect aggression	**<.001**	1.28
Irritability	**<.001**	1.25
Negativism	**.051**	1.17
Resentment	**.001**	1.22
Suspicion	**<.001**	1.22
Verbal aggression	**<.001**	1.20
STAXI-2		
Trait anger	**<.001**	1.07
Angry reaction	**.002**	1.11
Angry temperament	**<.001**	1.19
Anger expression-out	**.014**	1.06
FEEL		
Fear	**.030**	.89
BPRS		
Hostility Suspicion	**.002**	1.12
MCMI-III		
Compulsive *(Yes vs No)*	**.018**	.58
Passive-Aggressive *(Yes vs No)*	**.008**	1.92
Borderline *(Yes vs No)*	**.002**	2.11
Histrionic *(Yes vs No)*	**.048**	.57

Table 13. Interaction of metacognitive functions in predicting aggressive

behaviour

	p-value
BDHI Assault	**.001****
Metacognition (*groups*)	**.006****
Interaction	**.005****
BDHI Inderect aggression	**.000****
Metacognition (*groups*)	**.024****
Interaction	**.017****
STAXI Angry reaction	**.003****
Metacognition (*groups*)	**.005****
Interaction	**.012****

** Adjusted values for 'Age' and 'Disorder Duration' through GLMs
*° Adjusted values for 'Age' through GLMs

Table 14. Variables that interact with metacognitive functions in predicting

aggressive behaviour in the two groups (PM and GM)

	PM		GM	
	p value	**exp(β)**	*p value*	**exp(β)**
BDHI Assault	**<.001**	**1.36**	.293	1.08
BDHI Inderect aggression	**<.001**	**1.53**	.054	1.16
STAXI Angry reaction	**<.001**	**1.21**	.287	1.05

3.4 Discussion

Several studies have attempted to investigate the relationship between severe mental disorders and the risk of violence (Nederlof, Muris, & Hovens, 2013). People with severe mental disorders are more likely to commit violent acts than healthy controls from the general population (Volavka, 2014). Nevertheless, most individuals suffering from mental disorders do not perform aggressive behaviour, and most aggressive behaviour are not performed by individuals with diagnosed mental disorders (Glied & Frank, 2014).

The present study focused on metacognitive functioning as a potential discriminating aspect between patients with mental disorders who commit

aggressive behaviour and patients with the same disorders that do not commit such acts (Abu-Akel & Abushua'leh, 2004; Bo et al., 2015; Fonagy & Levinson, 2004). Furthermore, other important aspects suggested by literature, as potentially involved in aggressive behaviour, were considered together with metacognition: personality traits (Bateman & Fonagy, 2010; Coid, 2002; Fountoulakis et al., 2008; Howard et al., 2008; McGauley et al., 2013; Reid & Thorne, 2007; Shamay-Tsoory et al., 2010; Taubner et al., 2013); emotion recognition (Blair, 2004; Dawel et al. 2012; Glass & Newman, 2006; Marsh & Blair, 2008; Wegrzyn et al., 2017); and anger, impulsivity and hostility (Birkley & Eckhardt, 2015; Garofalo et al., 2016; Norlander and Eckhardt, 2005; Ramírez & Andreu, 2006; Rubio-Garay et al., 2016; Wegrzyn et al., 2017).

3.4.1 Metacognition and history of violence

The current study demonstrated that patients with poor levels of metacognitive functioning reported a more frequent history of physical violence against other people compared to patients with a good metacognitive functioning. In particular, the history of violence has been reported more frequently in patients with poor metacognition levels in specific functions (3 out of 4 functions).

The first function is Monitoring, which regards the skills of understanding and recognising one's own internal states, such as thoughts, emotions and bodily sensations. Patients with poor monitoring function have difficulties in recognising, verbalising and processing their internal states, especially negative ones, such as those arising from interpersonal conflicts, and have difficulty in referring their emotions to clear thoughts and in relating these mental states with the behaviour to act consistently with one's own goals. For this reason, patients with poor monitoring might be more likely to display these thoughts and emotions through aggressive physical behaviour against others compared to patients with a good

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monitoring. To act out their internal states becomes the only pathway for patients with poor monitoring to express them.

The second function is Differentiating, which concerns two abilities: 1) the differentiation of the external reality from other internal representations such as thoughts and dreams, etc.; 2) the consideration of one's own point of view as subjective and not universal and absolute. Also patients with poor differentiating reported violent behaviour in the past more frequently than patients with a good level of this skill; these patients are not able to consider alternative points of view to understand events of daily life, they deem their point of view as the only possible and proper interpretation of reality; moreover, these patients could also confuse their various mental representations with external realty (that could lead to psychotic symptoms), and perceive imagined threats as real; therefore, it is evident that patients with a deficit in these abilities might be more likely to commit violent acts than patients with good differentiation.

Finally, the Decentring function consists of the ability to understand and represent the internal states of others, in terms of thoughts, emotions and motivations. In the current study, decentring dysfunctions show the strongest evidence in favour of the link between metacognitive deficits and history of violence; indeed, the number of patients with poor decentring who have committed violence in the past is higher than in all the other functions. Especially in this case, it is evident that patients who have difficulty recognising and comprehending others' thoughts, emotions and motivations were more likely to be led towards violent acts, because they always placed focus on themselves and interpreted many situations as hostile and antagonistic to themselves.

These results, indicating a strong association between a poor (or absent) metacognitive functioning and history of physical violence, are consistent with clinical observations and with literature. Indeed, other studies support the

relationship between metacognitive dysfunctions and violence (Abu-Akel & Abushua'leh, 2004; Fonagy & Levinson, 2004). However, evidence about this topic is limited and contradictory: some authors have found a better metacognitive functioning (in specific abilities like understanding others' minds) in violent patients (in particular psychopathic patients), compared to non-violent patients, in aiming to manipulate and harm their victims (Abu-Akel et al., 2015).

Although the metacognition assessment occurred some years after the violence enacted by patients, the stability of metacognitive functions is reported in the literature (Dimaggio & Stiles, 2007; Lysaker et al., 2011d; Semerari et al., 2003b) and it is evident from the clinical observation. Unless a patient undergoes psychotherapy that could (when treatment is effective) partly improve these skills, metacognitive functions tend to remain stable over time.

It is also important to note that the data of the present study, according to other research (Fonagy & Levinson, 2004; Lysaker et al., 2005c; Mitchell et al., 2012), suggests that patients with mental disorders displayed an overall impairment in metacognitive functioning. Indeed, the levels of metacognitive functions of all the patients recruited were rated within the "poor" (PM group) and "good" (GM group) range, and never reached "very good" or "sophisticated."

3.4.2 Relationship between metacognition and personality traits, emotion recognition, anger, impulsivity and hostility

In relation to emotion recognition, the findings indicate that patients with a poor metacognitive functioning displayed greater difficulties in recognising facially expressed emotions compared to patients with good metacognition.

The link between poor metacognitive functioning and the difficulty in recognising emotions is clinically observable and consistent. The recognition of emotions felt by others through facial expressions is closely related to

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metacognition, in particular to Decentring; both dimensions refer to the ability of understanding emotions felt by others. In this sense, emotional recognition could be considered a part of Decentring. Metacognition includes both awareness of specific elements such as naming an emotion one experiences or inferring other people's thoughts from facial expressions or behaviour, to more synthetic judgements integrating psychological knowledge about the self and others into complex psychological representations (Carcione et al., 2011; Dimaggio & Lysaker, 2010; Lysaker et al., 2013b; Semerari et al., 2003a,b). Therefore, it is evident that metacognitive functioning and emotion recognition through facial expressions are involved in a two-way reciprocal relationship, although these abilities are not overlying and remain partially independent. The results are also consistent with Lysaker and colleagues (2014d), who revealed that greater deficits in mental state decoding, mental state reasoning and metacognitive abilities were related to deficits in the emotional recognition capacity.

With regard to the personality dimensions assessed with MCMI-III, patients with a poor metacognitive functioning reported more narcissistic and paranoid traits than patients with good functioning. Through the clinical observation, it is clear that patients with narcissistic and paranoid personality disorders have especially huge problems in metacognitive functions referred to in the Other domain, i.e. differentiating and decentring.

Unexpectedly, no differences emerged in other personality dimensions. A possible explanation is that the assessment tool of the personality dimensions (MCMI-III) is a self-report, and this could lead to an underestimation of the pathological traits. This is more likely in patients with greater metacognitive deficits. Moreover, other research has focused on samples of patients with personality disorders, while in this research the sample was heterogeneous. Finally, the present analysis focused on personality traits and not personality

disorders. Contrary to these results, literature demonstrated that all personality disorders are associated with metacognitive dysfunctions and these deficits represent a key aspect in personality pathologies; in particular, personality disorders are constituted on the basis of the metacognitive profiles (Dimaggio et al., 2009b; Moroni et al., 2016; Semerari et al. 2005; 2007; 2014; 2015). Indeed, patients with different PDs seem to present diversified profiles of metacognitive impairments: patients with avoidant personality disorder and narcissistic personality disorder, for example, showed low ability to monitor their own emotions (Dimaggio et al., 2007), while patients with borderline personality disorder had more preserved monitoring but exhibited a lack of integration and poor differentiation (Semerari et al., 2005).

In relation to the hostility feature, no differences emerged between patients with poor and good levels of metacognition, except for feelings of hostility and rancour towards others (the Negativism subscale of the BDHI).

Garofalo and colleagues (2016) indicate that the tendency to perceive the world as hostile consists above all in perceiving others as hostile, without adequately considering the information coming from the people and the environment. This explanation is consistent with the fact as patients with a poor metacognitive functioning may not be able to understand the mental states of others (and differentiate them from their own), and they might tend to interpret all events (and people's intentions) in a harsh and pervasive way, as threats to themselves. This could lead them to being hostile against a hostile world.

With regard to anger and impulsivity aspects (and other subscales of BDHI), no differences were found between patients with poor and good metacognitive functioning.

Despite these findings, clinical observations suggest that patients with poor metacognitive functioning might experience higher levels of anger, impulsivity

and hostility (as discussed above) compared to patients with good metacognition, because the former may not be able to recognise and elaborate their thoughts, or comprehend others' actions, and are more likely to be unable to regulate their emotions.

Nevertheless, clinical experiences have shown that also patients with a good metacognitive functioning might feel high levels of anger, impulsivity and hostility; in these cases, patients can use their metacognitive functions in order to understand their own and others' perspectives, and regulate their emotions.

The few studies that have dealt with the relationship between metacognition and anger have indicated the potential role of metacognitive beliefs in predicting anger and rumination prospectively (Caselli et al., 2017; Simpson & Papageorgiou, 2003).

3.4.3 Predictors of aggressive behaviour and the role of metacognitive functions

The aggressive behaviour shown by patients during the one-year follow-up was not different between patients with a poor metacognition and those with a good metacognition. This result emerged both in the MOAS mean scores and the MOAS trends, which included all 24 evaluations across time. These findings were observed in all 4 subscales that referred to the different types of aggression (Verbal, Against object, Against people, Self-aggression).

In general, the number and severity of aggressions of all the patients was limited: indeed, the average in the 12 months of the MOAS is 13.9 (in relation to a range which goes from 0 to 960) and is, for the most part, constituted by verbal aggressive behaviour. Obviously, on the one hand this is a positive outcome, which suggests that patients under the care of Mental Health Services are not particularly aggressive; on the other hand, the low number of aggressions could partially interfere to detect significant differences between the two groups.

Despite these results, a systematic review found that metacognition, and other dimensions such as psychotic symptoms, personality factors and substance use, may be linked to an increased risk of violence. In particular, it suggested that specific metacognitive profiles could be associated with the occurrence of violence in patients with schizophrenia (Bo, Abu-Akel, Kongerslev, Haahr, and Simonsen, 2011). Moreover, Taubner and colleagues (2016) demonstrated that metacognitive skills are mediators for the risk of violence in adolescents who were victims of child maltreatment. Unfortunately, there is no research on patients with other mental disorders that investigate the metacognitive functions in relation to the risk of violence; for this reason, future studies are recommended.

For the present study, patients were observed and monitored in two very different settings: some patients lived in residential facilities and others lived at home and attended monthly outpatient's visits. Consequently, this aspect could make the observation of aggressive behaviour more complex, because the chance and the risk of enacting violence in two distinct settings might be different; however, this variable was considered in the analyses and the result showed that setting did not significantly interfere with the prediction of aggressive behaviour. However, in the VIORMED project (Barlati et al., submitted), regarding the risk of aggressive behaviour in relation to the history of violence, outpatients with a history of violence were more likely to have violent recurrences than inpatients with such history.

The strongest predictors of aggressive behaviour during follow-up were the Borderline and Passive-Aggressive personality traits and the history of violence, while metacognition alone did not predict aggressive behaviour.

The importance of personality traits as risk factors for aggressive behaviour has been demonstrated by numerous studies. The previous studies related to the VIORMED project have already revealed that in the outpatients sample, the

following personality traits were predictors of aggressive behaviours: depressive, sadistic, passive-aggressive, schizotypal, borderline, and compulsive (Bottesi et al., submitted). Meanwhile, in an inpatients sample, Candini and colleagues (2017) found that the antisocial personality traits were strong predictors of aggressive behaviour. Other research has confirmed these results. For instance, two recent studies demonstrated that antisocial PD increases the rate of recidivism of violence among people with mental disorders (Coid, Ullrich, Bebbington, Fazel & Keers, 2016; Shepherd, Campbell & Ogloff, 2016).

In general, PDs are very common in different offending populations and there is evidence about the prominent role played by PDs and maladaptive personality traits in the risk of aggressive behaviour (Bo et al., 2013; Howard et al., 2008; Huber, Hochstrasser, Meister, Schimmelmann, & Lambert, 2016; Newhill Eack & Mulvey, 2009; Nolan et al., 2003; Terzi et al., 2017; Volavka, 2014). In a recent meta-analysis, Yu, Geddes & Fazel (2012) reported that offenders with any PD had two to three times higher odds of being repeat offenders than mentally ill offenders with no PD or non–mentally disordered offenders.

Literature has shown that the personality disorders most frequently associated with violence are those belonging to cluster B (Bo et al., 2013; Moran & Hodgins, 2004; Mueser et al., 1997), particularly the antisocial and borderline ones (Howard et al., 2008). Furthermore, for the current study, a very interesting aspect is that these disorders were clearly linked to metacognitive deficits in previous studies: both borderline (Bateman & Fonagy, 2010; Semerari et al., 2015) and antisocial patients (Fonagy, 2004; McGauley et al., 2013; Taubner et al., 2013) showed an impaired metacognitive functioning, characterised by perspective-taking problems and difficulty in understanding others' mental states. These disorders share several pathological dimensions: marked impulsivity and unpredictability, difficulties with emotional regulation and anger control,

disregard for safety of self, and behaviour that can be considered by others to appear manipulative (Bateman et al., 2016). On the contrary, the passive-aggressive traits were less associated with the risk of interpersonal violence: individuals with passive-aggressive traits would be more emotionally unstable and complaining and more often tend to express aggression through indirect behaviour followed by confessions of regret (Craig, 2003; Millon & Davis, 1997).

One possible explanation of the reason why in the present study the passive-aggressive trait emerges as a risk factor for aggressive behaviour, is that this trait is an indirect feature of aggression and is probably less affected by the bias of social desirability, typical of the self-report measure.

Another strong predictor of aggressive behaviour is the history of violence. This result is confirmed by other studies of the VIORMED project (Bulgari et al. 2016; Candini et al., 2017; de Girolamo et al, 2016) and by numerous studies on patients with mental disorders and/or offenders that demonstrated the crucial role played by the history of violence in increasing rates of violence recidivism among individuals with past aggressive behaviour (Fazel, Buxrud, Ruchkin, & Grann, 2010; Fazel, Gulati, Linsell, Geddes, & Grann, 2009; Lund, Hofvander, Forsman, Anckarsäter, & Nilsson, 2013; Swogger, Walsh, Houston, Cashman-Brown, & Conner, 2010). At the same time, the very important finding of the present study is that people with history of violence are characterised more frequently by poor metacognitive functioning compared to patients without such history. The data is supported by other studies (Abu-Akel and Abushualeh, 2004; Fonagy & Levinson, 2004). Therefore, despite metacognition alone not being a predictor of aggressive behaviour, it is important to note that the history of violence, which was found to predict aggressive behaviour, is more frequent in people with metacognitive deficits.

Thus, metacognitive deficits are associated with history of violence, which in turn increases the risk of committing aggressive behaviour.

In addition, hostility being a predictor of aggressive behaviour is in line with the literature showing that the hostility dimension is strictly related to violence (Birkley & Eckhardt, 2015; Norlander & Eckhardt, 2005; Ramirez & Andreu, 2006). This result emerged in both the BDHI questionnaire and the Hostility-Suspicion dimension of the BPRS instrument, and is consistent with the clinical observation. The tendency to perceive the world and individuals as hostile is a feature of psychological functioning that might be a strong predictor of violent behaviour (Garofalo et al. 2016). Indeed, if everything is interpreted as a threat, hostility and suspicion are consequent and 'legitimate', and the attack-defence reaction (even through aggressive behaviour) is more likely.

The anger dimension was also found to be a predictor of aggressive behaviour. A recent meta-analytic review confirmed a robust relationship between anger and violent behaviour (Cheriji, Pineta & David, 2013); other authors have demonstrated the fundamental role played by anger in the risk of violence (Norlander & Eckhardt, 2005; Stefanile, Matera, Nerini, Puddu, & Raffagnino, 2017) and, in this direction, a recent review suggested that anger treatments are moderately effective in the reduction of aggression (Lee & DiGiuseppe, 2018).

Finally, the present research showed the role of metacognitive functions associated with other variables that predict aggressive behaviour. Indeed, metacognitive functions interact with hostility manifested through direct and indirect aggression (two BDHI subscales), and with angry reaction through aggressive behaviour (one STAXI-2 subscale). In particular, these variables emerged as predictors of aggressive behaviour only in patients with poor metacognitive functioning. This means that these variables are predictive of aggressive behaviour only if they are associated with poor metacognition. The

latter result is very important to note because it leads to a relevant conclusion, already supported by clinical observation. Some dimensions strongly linked to aggressive behaviour, such as hostility and anger, are not predictors per se, but they become risk factors when metacognitive capacities are impaired and the person fails to express such internal states in an adaptive way. The lack of processing and regulation of some internal states thanks to good metacognitive abilities could even lead to aggressive behaviour. At the same time, metacognitive functions might be considered as protective factors towards aggressive behaviour, reducing the aggressive value of some aspects (for example hostility and anger).

In line with these findings, there is also evidence showing that psychosocial and metacognitive skills such as empathising and understanding the perspective of others are associated with reduced aggressive behaviour (Abu-Akel & Abushualeh, 2004; Flight & Forth, 2007; Woodworth & Porter, 2002).

However, the literature concerning metacognitive functions as predictors and/or relevant variables in relation to the risk of aggressive behaviour is still very limited; for this reason and taking into account the obvious relevance of the topic, further studies are recommended.

3.5   Limitations and future directions

This research presents some limitations. The first is the sample size; in particular for the longitudinal evaluation of aggressive behaviour, the number of patients and consequently the number of their aggressive behaviour during the follow-up was rather small. With regard to this aspect, also the length of the follow-up was limited: observing any aggressive behaviour during only one year did not allow to detect a large number of aggressions. This inevitably introduces the risk of Type II errors into analyses of the current study.

Other limitations consist of several relevant unevaluated aspects related to metacognitive functioning and aggressive behaviour, such as child maltreatment, psychopathy, neuropsychological features, monitoring of alcohol and substance use and other significant life events during one-year follow-up.

Moreover, the very heterogeneous sample, while important for the observation and the ecology of the project, it could also have brought many potential confounding factors. Indeed, patients were both outpatients and inpatients, had different diagnoses and very different lengths of disease, etc. Obviously, all these variables have been analysed and did not present confounding factors, but it is plausible that the numerous elements present in the sample's characteristics produced results that are more difficult to interpret. For example, the two settings have inherently different risk and protective factors. Many risk factors for aggressive behaviour such as substance use, poor adherence to treatment and environmental stressors are more limited in a residential setting compared to an outpatient's one.

Nevertheless, the aim of the current study was to identify the relationship between metacognition and aggressive behaviour, considering metacognition as an underneath variable of many other clinical, environmental and personal aspects. Furthermore, this is the first study that analyses metacognitive functions both in relation to the longitudinal observation of aggressive behaviour and in relation to the type of aggressiveness (verbal, against object, against people, self-aggression).

Another limitation might consist in the intrinsic difficulty of evaluating metacognitive functions, due to difficulties both in eliciting them and in interpreting data. The semi-structured interview, like the MAI, is the most effective instrument, as it is sufficiently flexible; on the contrary, self-report

measures might be inadequate because they are not capable of eliciting metacognitive functions in patients with compromised metacognition.

However, the interview (MAI) needs a more accurate validation and a deep analysis of the theoretical model related to the 4 metacognitive functions is required to define them more specifically. The model splits the 4 functions into two domains: the Self domain, including Monitoring and Integrating, and the Other domain, including Differentiating and Decentring. In the Self domain, Integrating in particular concerns the ability to integrate elements and explanations not only of one's own but also of others' behaviour (but this aspect is incorporated in Decentring). In the same way, in the Other domain, Differentiating in particular also contains elements that concern one's own ability to distinguish between sensory perceptions and thoughts. Finally, the MAI does not include a specific evaluation (and specific score) of the Mastery domain (which was present in previous versions of the instrument), which refers to the ability to use all information about the mental states of oneself and others in order to solve social problems and realise one's own goals.

For these reasons, further studies about both the theoretical model and evaluation tool are recommended.

CHAPTER 4

CLINICAL CONSIDERATIONS

Violent behaviour of patients with mental disorders is a worldwide public health problem, which demands substantial amount of staff time and efforts for its management, and significantly contributes to increase the stigma of mental illness (Torrey, 2002). For these reasons it is important to investigate factors associated with the risk of offence in order to plan appropriate prevention and treatment. To realize these plans there is a need to understand what mechanisms and/or difficulties lead people with a mental disorder to commit aggressive behaviour. Only through the research of these mechanisms will it be possible to identify the critical dimensions that need to be treated to prevent violence.

The VIORMED project aims at investigating a large set of correlates and predictors of aggressive behaviour in patients with severe mental disorders. This thesis therefore has focused on metacognitive functions. Indeed, there are three pathways that could lead metacognitive dysfunctions to violence (Semerari et al., 2003a).

First, the inability to recognize and interpret how one's own mental states causes confusion about the self, one's own fears, desires and goals (deficits in 'Monitoring' and 'Integrating'). This confusion implicates deficits in the ability to reason mental causality, e.g., how events trigger an emotion. This is mediated by cognitive interpretations about how behaviour is activated by cognition and its effects. When people lack the ability to understand what drives their reactions and behaviour, it is unlikely that their social functioning will be effective. Moreover, a person who fails to comprehend and elaborate what he/she feels and thinks could reflect it directly through action (which in some cases could be aggressive) as the only path of expression.

Second, the incapacity to recognize thoughts and emotions of others (i.e., deficits in 'Differentiating' and 'Decentering') more frequently means not actually understanding others' behaviour and others' points of view, which could lead to interpret other's actions as always being addressed to themselves, as hostile and as threatening. In addition, the inability to consider one's own ideas about interpersonal matters as subjectivity implies rigidity in interpretation of events and does not allow for a change of perspective based on incoming discrepant information. This condition may lead people to hold negative views of themselves and others without questioning them and make them unable to resolve conflict or agree on shared plans. Furthermore, the impairment of the ability to envisage others' mental states might more probably cause harm to others, as this mental state information is what ordinarily inhibits harmful behaviour.

Third, the incapability to integrate all mental state information about themselves and others to solve interpersonal problems (i.e., deficits in 'mastery' skills) could lead a person to have an absence or shortage of adaptive strategies and consequently, to use more primitive coping skills including aggression.

It is evident that these metacognitive dysfunctions are closely linked to the risk of violence and constitute essential areas to be treated in order to avoid aggressive behaviour. Each patient may have certain deficits and not others because, as previously discussed, metacognitive functions are correlated but only partially independent. For this reason, it is important to have precise assessment measurements to identify compromised functions in order to plan effective personalized interventions to reduce the risk of violence.

The prevention of aggressive behaviour, taking into account metacognitive functions, concerns two issues. On one hand, early identification of patients at high risk of aggressive behaviour through a precise evaluation of metacognitive dysfunctions, in order to successfully treat them and avoid violent acts. Deficits in

metacognition may also impair help-seeking in the first contact with Mental Health Services and this influences the Duration of Untreated Psychosis (DUP) phase (Macbeth et al., 2015). There is a known association between prolonged DUP and poorer outcomes (Penttilä, Jääskeläinen, Hirvonen, Isohanni, & Miettunen, 2014). Also for this reason, early identification of patients with metacognitive dysfunction is essential to effectively treat them in a timely manner through metacognitive psychological treatment.

On the other hand, the prevention of violent relapses in patients with a history of violence is a fundamental issue. This current research demonstrates that patients with poor metacognitive functioning have a more frequently history of violence than patients with good metacognitive functioning and that in turn, the history of violence is a strong predictor of future aggressive behaviour. Thus, and in light of the association between metacognitive deficits and the risk of violence, it appears to be crucial to offer metacognitive psychological treatment to patients with a history of violence in order to try to effectively treat metacognitive deficits.

According to clinical metacognitive approach of the Third Centre of Cognitive Psychotherapy (Carcione et al., 2008; Semerari et al., 2003a,b; 2007; 2014), the therapist can help the patient by means of metacognitive psychological interventions in the following processes: (a) to recognize and elaborate one's own internal states, both cognitive and emotional, giving personal meaning; (b) to understand what he/she fears and at the same time what he/she wants to achieve in a certain situation; (c) to express one's own thoughts, emotions, fears and desires in an adaptive and functional way for his/her self and for his/her society; (d) to integrate all this information into personal and continuous experience in which the patient recognizes him/herself and consequently, to implement an adaptive and consistent behaviour with this representation; (e) to distinguish between internal reality, constituted by thoughts, images, dreams and an external

reality, detected through senses; (f) to consider one's own point of view as subjective and debatable, and not as absolute and universal for everyone; (g) to build other's point of view, through recognition (or at least the hypothesis) of thoughts and emotions of others and integrate this information into coherent and complex representations concerning others; (h) finally, to use all the above information to guide behaviour towards personal goals, to resolve any relational problems in a functional way for the patient and society (thus peacefully and respectfully).

Certain studies already support the need for treatment addressing metacognitive abilities to improve the psychosocial outcomes of patients with severe mental disorders (Bargenquast & Schweitzer, 2014; Bateman & Fonagy, 2008a; Briki et al, 2014; Carcione et al., 2011; Dimaggio & Lysaker, 2015; Eichner & Berna, 2016; Hasson-Ohayon et al., 2015; Lysaker et al., 2011c, 2015c; Moritz et al., 2014; Salvatore et al., 2012), and in particular, of patients with mental disorders and a history of violence (Bateman & Fonagy, 2008b).

Bo and colleagues (2015) in their study about patients with schizophrenia and criminal history, suggested that treatment focused on the functional level of metacognition could reduce delusions and strengthen social functioning. Therefore, they underline the importance of intervention designed to enhance patients' metacognitive abilities, as the more proximal abilities linked to social functioning. Bateman and Fonagy (2016) in recent research on patients with antisocial personality disorder (and comorbidity with borderline disorder), also found that measures of negative mood and general psychiatric symptoms showed significant improvement and better adjustment following the Mentalization Based Treatment (MBT). Similarly, common sequels of aggression such as poor general functioning, interpersonal problems and social adjustment at the end of treatment were improved as a result of the MBT compared with control patients.

These findings demonstrated that despite the variety of conceptual approaches, there is extensive agreement that individuals need to recognize their internal mental states in order to build constant and coherent self-representations. They must also understand others' mental states in order to establish and maintain adaptive and satisfying interpersonal relationships (Dimaggio & Stiles, 2007; Jorgensen, 2010).

Aggressive behaviour can be considered one of the worst outcomes of poor psychosocial functioning, perhaps the most important outcome to be avoided as it damages others. For this reason and considering that research in this field is still very limited and inhomogeneous (both in terms of theoretical approaches and evaluation measures), further studies are needed to deepen the role of metacognitive function (considering different sub-functions) in relation to aggressive behaviour (considering different types of aggression) and to investigate whether psychotherapy focused on metacognitive functions is effective to avoid and/or reduce interpersonal violence.

Finally, the present research has a very significant socio-cultural impact, especially in light of the recent laws (n. 9/2012 and 81/2014) that set the deadline of 31 March 2015 for the gradual discharge of all patients from Forensic Mental Hospitals and their relocation to special high-security units, with no more than 20 beds each. In addition, many patients at lower risk of re-offending, will be cared for by ordinary Mental Health Departments (DMHs). This change will involve increasing legal responsibility of both individual psychiatrists and DMHs and will also require a substantial organizational change for mental health services compared to the past.

The management of mentally ill offenders in the community is one of the great challenges imposed on community psychiatry. Violence by the mentally ill has a profound detrimental effect on public opinion, is associated with stigma and

discrimination and poses a great burden on family members (who are often victims of such violence) and on society.

Given this radical change and given the paucity of Italian studies in this area, further research is needed to provide information about the evaluation, treatment and monitoring of patients with mental disorders with a history and/or a high risk of violence. Additional scientific evidences are essential to provide useful indications for planners and clinicians who have the relevant task of planning, developing and monitoring new care pathways for mentally ill offenders in Italy.

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APPENDIX 1

METACOGNITION ASSESSMENT INTERVIEW (MAI)

DOMANDA:

"Mi può raccontare l'episodio o la situazione interpersonale peggiore (che le ha causato più malessere), dal punto di vista psicologico, in cui si è trovato negli ultimi 6 mesi?" Possibilmente un episodio di natura relazionale, in cui cioè era coinvolta un'altra persona che lei conosce.

	Domanda	aiuto	Commen
1	**Riguardo a quello che mi ha appena raccontato (A). Cosa provava (C)?**		
2	**Quali erano le sue emozioni (C)?** Se il soggetto riferisce solo una descrizione somatica es."avevo il fiato corto; mi sudavano le mani" L'intervistatore può aiutarlo dicendo: ✓ **Aiuto** *"provi a trovare un termine che identifichi queste sensazioni corporee"* Se il soggetto non fornisce nessuna descrizione adeguata né con un termine né con una metafora congrua ✓ Aiuto *"può dare un nome a ciò che ha provato? E' più vicino alla rabbia, alla tristezza o…"* l'intervistatore fornisce una serie di possibilità di emozioni di base per aiutare il soggetto		
3	**E quale è stata la causa di queste emozioni?** Se il soggetto riporta diverse emozioni. L'intervistatore deve concentrarsi su ciascuna in modo da valutare: ✓ **Aiuto**: se alcune emozioni possono risultare secondarie ad altre (ed es. mi sono vergognata per essermi arrabbiata in quel momento), se il soggetto		

non chiarisce spontaneamente questi nessi, l'intervistatore deve chiedere di precisare la sequenza temporale in cui ha provato le diverse emozioni con domande del tipo: *"qual è stata la successione nel tempo di queste emozioni? Qual è stata la prima? In che momento ha provato l'emozione_____ (emozione riferita)?* Domande di questo tipo sollecitano la funzione di relazione tra variabili. Per questa ragione, dopo aver indagato la sequenza temporale può essere utile anticipare qui la domanda successiva: *"perché ha provato secondo lei proprio queste emozioni?" "cosa può avergliele suscitate?"*

- ✓ **Aiuto**: Se la numerosità di emozioni riferite suggerisce una confusione da parte del soggetto rispetto a ciò che ha provato: *" ha fatto riferimento a diverse emozioni, qual era l'emozione principale secondo lei?".* La risposta a questa domanda pertiene già alla funzione dell'integrazione (vedi sotto).
- ✓ **Aiuto**: Se il soggetto riporta solo descrizioni somatiche es." mi sentivo un peso sul petto oppure mi veniva da piangere", l'intervistatore può aiutarlo a definire l'emozione a partire dallo stato somatico con domande tipo *"lei mi ha detto di aver percepito_____(sensazione somatica percepita), questa sensazione secondo lei era più legata ad un'emozione di_____ oppure di_____(elenco di possibili emozioni di base legate allo stato somatico).*

4	**Quali erano i suoi pensieri (B)?**		

- ✓ **Aiuto**: Se il soggetto elenca una serie di pensieri, l'intervistatore deve porre la seguente domanda: *'ha fatto riferimento a diversi pensieri, quali erano secondo lei quelli più rilevanti?'*
- ✓ **Aiuto**: Se il soggetto riferisce di non aver pensato a nulla e di avere solo reagito sull'onda di un'emozione, l'intervistatore potrà aiutarlo dicendo:

"provi a riflettere su cosa può aver pensato o a quale interpretazione si stava dando della situazione; è difficile non pensare proprio a nulla, agire senza che ci sia un'interpretazione di ciò che sta accadendo"

Oppure: *"dice di non aver pensato proprio a nulla. Ma è possibile che le sia passata per la mente almeno un'immagine di ciò che stava accadendo?"*

5	**E quale è stata la causa di questi pensieri?**		

- ✓ **Aiuto:** Se il soggetto non riconosce alcuna relazione tra pensieri ed emozioni o tra pensieri ed altri stati mentali, l'intervistatore può dire: *"ci pensi un attimo, nel momento in cui ha pensato_____ che sensazioni, immagini o pensieri ha avuto?"*
- ✓ **Aiuto:** Se il soggetto non riferisce nessun legame tra pensieri ed emozioni l'intervistatore può aggiungere: *"ci pensi un attimo, nel momento in cui ha pensato_____ che immagini o pensieri hanno accompagnato questa sua riflessione?"*

6	Che cosa ha fatto (D)?		
7	Cosa l'ha spinta ad agire così? ✓ **Aiuto**: Se il soggetto risponde in modo vago o poco attinente agli stati mentali descritti. L'intervistatore può specificare la domanda facendo esplicito riferimento al comportamento descritto: *"Lei mi ha detto di aver reagito_____ (comportamento riferito) che cosa l'ha spinta ad agire così?.* Sebbene la ripetizione della domanda possa sembrare una chiarificazione, essa viene valutata come aiuto dal momento che in questo modo l'intervistatore aiuta il soggetto a focalizzarsi in modo specifico sulla relazione che c'è tra stato interno e comportamento. ✓ **Aiuto**: Se il soggetto continua a non riportare alcuna relazione tra il suo comportamento e gli stati interni l'intervistatore può aiutarlo ipotizzando alcune spiegazioni del comportamento in funzione degli stati interni; ad es. *"lei mi ha detto di aver reagito rimanendo immobile, è stata la paura di peggiorare la situazione, l'imbarazzo di dover prendere la parola o…."*		
8	Quindi, provando a riassumere l'episodio che mi ha appena raccontato; lei h provato…, pensato…ed ha reagito…Qual era il suo obiettivo in quel momento, cioè quando ha (aggiungere D)?		
9	Cosa desiderava? E cosa temeva in quella situazione ?		
10	Quindi, ha detto di aver provato (emozione riferita-C). Quando è variato il suo stato d'animo? ✓ **Aiuto**: se il soggetto dice di non ricordare, l'intervistatore può dire: '*Ci pensi un attimo, quanto è durato secondo lei quello stato d'animo (un'ora, un giorno etc…) cosa può averlo fatto variare secondo lei?'* ✓ **Aiuto**: Se il soggetto non riferisce mutamenti dello stato interno, l'intervistatore lo può facilitarlo facendo riferimento, per esempio, alle emozioni o pensieri riportati precedentemente dal soggetto: *"per esempio lei mi ha detto di aver inizialmente sentito un nodo alla gola e successivamente di essersi sentito molto deluso da sé stesso…quando secondo lei è passato dal nodo alla gola a…"* . Oppure, se il soggetto riporta di pensare e provare le stesse cose rispetto alla specifica situazione descritta, l'intervistatore potrà suggerire: *"tuttavia, sebbene nel momento in cui ripensa all'accaduto pensa e/o prova le stesse cose, immagino ci siano momenti in cui questi pensieri e stati d'animo siano meno presenti o sostituiti da altri pensieri e sensazioni."* ✓ **Aiuto**: se il soggetto non è in grado di individuare elementi interni o esterni che hanno contribuito alla variazione di stato, l'intervistatore può aiutarlo dicendo: *"E' stato secondo qualche evento o situazione esterna o è stato un suo processo interiore?"* **Se no:** vai alla 13.		

11	**In che modo è variato?**		
12	**Cosa, secondo lei, lo ha fatto variare?**		
13	**Lei ha detto di aver pensato..(l'intervistatore si riferisce all'episodio raccontato). Quanto soggettivamente ci credeva, in quel momento, al pensiero che.. (pensiero riferito-B)?** ✓ **Aiuto:** Se il soggetto non comprende il senso della domanda, l'intervistatore può aiutarlo mettendo direttamente in relazione il pensiero con l'emozione provata: es. '*Lei ha detto di aver provato rabbia verso i medici perché sua zia è morta ingiustamente. Quanto soggettivamente ci credeva in quel momento che fosse morta ingiustamente e quanto ha considerato altre possibilità?*' ✓ **Aiuto**: Se il soggetto continua a non vedere la possibilità di un'interpretazione alternativa dei fatti, l'intervistatore può aiutare il soggetto formulando lui stesso una nuova interpretazione dicendo: "*secondo lei è ipotizzabile pensare che…*"		
14	<u>Se sì</u>: **Da uno a dieci quanto ci credeva?**		
15	**Erano possibili, a suo avviso, letture alternative dei fatti (rispetto al suo pensiero-B)?** <u>Se no:</u> vai alla 16b		
16a	<u>Se sì</u>: **quali?**		
17a	<u>Se sì</u>: **Cosa è mutato?**		
18a	<u>Se sì</u>: **Cosa ha favorito questo cambiamento?**		
19	**Ripensandoci adesso c'è qualcosa che ha modificato il suo punto di vista (rispetto a 6 mesi fa?**		
16b	<u>Se no</u>: **Pensa che, in futuro, potrebbe modificare il suo punto di vista su quanto è successo?**		
17b	<u>Se no</u>: **Cosa potrebbe spingerla a rivedere il suo punto di vista su quanto è successo?**		
20	**Durante l'episodio descritto, si sentiva per caso in uno stato di confusione, come in un sogno, o con un senso di irrealtà tale da non ricordare se un evento fosse realmente avvenuto o solo immaginato?**		

21	Le è mai capitato di avere questo stato di confusione, di sentirsi come in un sogno o come avvolto nella nebbia? **Se no:** vai alla 22		
21a	**Se sì:** Le è capitato di immergersi in fantasie tali da perdere la nozione del tempo e il rapporto con il mondo reale?		
21b	**Se sì:** Le è mai capitato di avere immagini o ricordi molto vividi che vive con se stessero accadendo realmente in quel momento?" Mi può fare degli esempi?		
21c	**Se sì:** In questo momento sente la stessa confusione?		
22	**Dunque lei si è trovato/a ad avere reazioni come____(indicare il comportamento descritto), a sperimentare emozioni come____o a pensare____.** **Le capita spesso di sentirsi/pensare/provare/fare cose di questo genere?** L'intervistatore nel riassumere l'episodio del soggetto deve sintetizzare **l'emozione prevalente e i pensieri e i comportamenti connessi all'emozione** prevalente come individuato durante l'intervista sul monitoraggio (pensieri, emozioni e comportamenti) mostrandoli come uno stato mentale complessivo e potenzialmente ricorrente. ✓ **Aiuto**: se il soggetto si focalizza solo su un elemento del racconto, ad esempio sul comportamento agito, l'intervistatore può riprendere la domanda dicendo: "*intendo però non solo situazioni in cui_____, ma in cui ha anche provato emozioni e pensieri simili a quelli che mi ha raccontato….*"		
23a	**Se sì:** Come mai ha questo modo tipico?		
24a	**Le sarà però capitato di reagire in maniera diversa, cioè con emozioni e pensieri diversi, a circostanze come quelle che ha descritto. Ricorda qualche episodio in cui questo è accaduto, cioè una circostanza dove pensava che.. (e metti la B) o che provava.. (E) o che ha reagito..(D)?**		

Potrebbe provare a descrivere questo episodio? *[le circostanze possono essere sempre rappresentate anche dal modo di sentirsi e/o di pesare e/o di comportarsi del pz]* Importante per la funzione di integrazione. (Se più critico emotivamente o comunque la terza persona coinvolta è meglio conosciuta rispetto a quella coinvolta nell'episodio riferito all'inizio, usare questo nuovo episodio per il decentramento). **Se no: vai a 23b**	

25a	**Quindi a volte reagisce _____(primo esempio_l'intervistatore** qui riassume lo stato tipico del soggetto ovve <u>pensieri/emozioni/comportamenti</u> , usando una terminologia più vicina possibile a quella dell'intervistato stesso), mentre altre volte reagisce_____(episodio due_ l'intervistatore riassume qui il nuovo racconto ottenuto con la domanda). Da che cosa dipende secondo lei la differenza?		
26 a	**Come mai, secondo lei, aveva reagito nel primo modo?** **Come mai, secondo lei, aveva reagito nel secondo modo?** ✓ **Aiuto**. Se il soggetto fa fatica a fornire un confronto plausibile, l'intervistatore può aiutare il soggetto dicendo: "*in tutte queste circostanze cosa c'è in comune nel suo stato d'animo e nel suo modo di pensare?*" ✓ **Aiuto:** Se il soggetto fa fatica a fornire un confronto plausibile, l'intervistatore può aiutare il soggetto dicendo: "*che differenza c'è secondo lei tra quando_____ (riferimento a stati interni riportati in un episodio) e quando_____ (riferimento a stati interni riportati in secondo episodio)?*" ✓ **Aiuto**. Se il soggetto fa fatica a fornire una spiegazione della transizione tra stati mentali, l'intervistatore può aiutare il soggetto dicendo: "*Che cosa le permette, secondo lei, di passare da…(stato interno) a (secondo stato interno)?*" Vai alla 27		
23 b	<u>Se no:</u> **"Le viene in mente un suo tipico modo di reagire a circostanze diffici** <u>Se sì:</u> vai alla 24b		
24 b	<u>Se sì:</u> **Come ha reagito in quel momento?** **Che emozioni ha provato in quelle altre circostanze?** **Che pensieri?** Vai alla 25b		
23 c	<u>Se no:</u> ripetere domanda 22.		

25 b	Quindi a volte reagisce_____(primo esempio_l'intervistatore qui riassume lo stato tipico del soggetto, usando una terminologia più vicina possibile a quella dell'intervistato stesso), mentre altre volte reagisce_____(episodio due_ l'intervistatore riassume qui il nuovo racconto ottenuto con la domanda). Da che cosa dipende secondo lei la differenza?		
26 b	**Come mai, secondo lei, aveva reagito nel primo modo?** **Come mai, secondo lei, aveva reagito nel secondo modo?** ✓ **Aiuto**. Se il soggetto fa fatica a fornire un confronto plausibile, l'intervistatore può aiutare il soggetto dicendo: "*in tutte queste circostanze cosa c'è in comune nel suo stato d'animo e nel suo modo di pensare?*" ✓ **Aiuto:** Se il soggetto fa fatica a fornire un confronto plausibile, l'intervistatore può aiutare il soggetto dicendo: "*che differenza c'è secondo lei tra quando_____ (riferimento a stati interni riportati in un episodio) e quando_____ (riferimento a stati interni riportati in secondo episodio)?*" ✓ **Aiuto**. Se il soggetto fa fatica a fornire una spiegazione della transizione tra stati mentali, l'intervistatore può aiutare il soggetto dicendo: "*Che cosa le permette, secondo lei, di passare da_____c(stato interno) a_____ (secondo stato interno)?*".		
27	**Mi ha detto che _____ (nominare il personaggio del racconto) ha avuto un ruolo importante in questa storia. Vorrei che provasse a mettersi dal suo punto di vista.** **Secondo lei come ha vissuto l'episodio (**emotivamente**) l'altra persona**? ✓ <u>**Aiuto**</u> "*vorrei che lei si focalizzasse sui pensieri e le emozioni che l'altro può aver provato in quella specifica circostanza, e non in generale*".		
28	**Che emozioni avrà provato?** ✓ **Aiuto** "*può dare un nome a ciò che potrebbe aver provato (nome dell'altro) ? E' più vicino alla rabbia, alla tristezza o…*" l'intervistatore fornisce una serie di possibilità di emozioni di base per aiutare il soggetto. ✓ **Aiuto** "*Dato il modo di pensare e di comportarsi di (nome dell'altro), come potrebbe sentirsi di fronte ad una cosa del genere?*".		

29	Perché ha provato quel tipo di emozione? Da che cosa lo ha dedotto?		
30	Che cosa avrà pensato?		
31	Perché, secondo lei, ha pensato in quel modo? Che ragioni aveva?		
32	Per come lo conosce è tipico di____(nome del personaggio) pensare e sentire in quel modo?		
32 a	<u>Se sì</u>: perché ha questo modo tipico di reagire?		
33 a	**Mi può fare un altro breve esempio di quando questa persona che conosce h provato, sentito e si è comportato nello stesso modo?** ✓ **Aiuto**. Se il soggetto fornisce spiegazioni degli stati mentali altrui che risultano incongruenti, inverosimili o generici rispetto all'episodio narrato, l'intervistatore può fornire un aiuto mettendo in luce l'implausibilità della spiegazione fornita: "*Mi scusi mi faccia capire meglio, prima mi ha detto che (nome dell'altro) ha agito (dicendo, facendo, essendo nella condizione di) e che questo ha avuto…(effetto ottenuto e incongruente rispetto all'interpretazione fornita), ora però mi descrive (nome dell'altro) come una persona che….come si conciliano questi due aspetti di (…) o cosa spiega, secondo lei, questa diversità ?*"		
32 b	<u>Se no</u>: perché è stato diverso?		

APPENDIX 2

Adjusted Models

FEEL

Dependent variable: FEEL Sadness

	Type III		
	Wald Chi-Square	df	*p-value*
(Intercept)	112.673	1	.000
Group (PM vs GM)	6.109	**1**	**.013**
Age	.018	1	.892
Disorder duration	1.021	1	.312

Dependent variable: FEEL Disgust

	Type III		
	Wald Chi-Square	df	*p-value*
(Intercept)	615.265	1	.000
Group (PM vs GM)	.059	1	.808
Disorder duration	2.930	1	.087

Dependent variable: FEEL Fear

	Type III		
	Wald Chi-Square	df	*p-value*
(Intercept)	128.613	1	.000
Group (PM vs GM)	.518	1	.472
Age	2.412	1	.120

Dependent variable: FEEL Total

	Type III		
	Wald Chi-Square	df	*p-value*
(Intercept)	2863.434	1	.000
Group (PM vs GM)	6.435	1	**.011**
Age	.630	1	.428
Disorder duration	1.043	1	.307

BDHI

Dependent variable: BDHI Assault

	Type III Sum of Squares	df	Mean Square	F	*p-value*	Partial Eta Squared
Corrected Model	30.805*	2	15.403	3.104	.047	.035
Intercept	1973.760	1	1973.760	397.824	.000	.702
Education level	26.099	1	26.099	5.261	.023	.030
Group (PM vs GM)	1.471	1	1.471	.297	.587	.002
Error	838.474	169	4.961			
Total	3356.000	172				
Corrected Total	869.279	171				

*R Squared = ,035 (Adjusted R Squared = ,024)

Dependent variable: BDHI Suspicion

	Type III Sum of Squares	df	Mean Square	F	*p-value*	Partial Eta Squared
Corrected Model	39.210*	2	19.605	3.160	.045	.038
Intercept	384.876	1	384.876	62.032	.000	.282
Group (PM vs GM)	.001	1	.001	.000	.991	.000
Disorder duration	37.799	1	37.799	6.092	.015	.037
Error	980.305	158	6.204			
Total	3951.000	161				
Corrected Total	1019.516	160				

*R Squared = ,035 (Adjusted R Squared = ,026)

STAXI-2

Dependent variable: STAXI-2 State Anger

	Type III Wald Chi-Square	df	*p-value*
(Intercept)	1467.516	1	.000
Group (PM vs GM)	1.913	1	.167
Age	5.135	1	.023

Dependent variable: STAXI-2 Feeling angry

	Type III Wald Chi-Square	df	*p-value*
(Intercept)	246.436	1	.000
Group (PM vs GM)	.627	1	.429
Age	3.762	1	.052

Dependent variable: STAXI-2 Trait Anger

	Type III Wald Chi-Square	df	*p-value*
(Intercept)	1360.329	1	.000
Group (PM vs GM)	.132	1	.716
Age	14.807	1	.000
Age of first contact	3.082	1	.079

Dependent variable: STAXI-2 Angry Temperament

	Type III Wald Chi-Square	df	*p-value*
(Intercept)	261.542	1	.000
Group (PM vs GM)	.005	1	.946
Age	7.769	1	.005
Age of first contact	1.111	1	.292

MOAS

Dependent variable: MOAS Total

	Type III Wald Chi-Square	df	*p-value*
(Intercept)	60.956	1	.000
Group (PM vs GM)	.014	1	.905
Age	5.463	1	.019
Disorder duration	.003	1	.960

Dependent variable: MOAS Verbal

	Wald Chi-Square	Type III df	p-value
(Intercept)	38.112	1	.000
Group (PM vs GM)	1.465	1	.226
Age	6.048	1	.014
Disorder duration	.088	1	.767

Dependent variable: MOAS Against objects

	Wald Chi-Square	Type III df	p-value
(Intercept)	15.771	1	.000
Group (PM vs GM)	.444	1	.505
Age	6.409	1	.011
Age of first contact	.046	1	.831

Dependent variable: MOAS Against people

	Wald Chi-Square	Type III df	p-value
(Intercept)	6.102	1	.014
Group (PM vs GM)	.655	1	.418
Age	1.472	1	.225

Models with interaction

	Wald Chi-Square	Type III df	p-value
(Intercept)	29.315	1	.000
BDHI_Assault	10.175	1	.001
Group (PM vs GM)	7.528	1	.006
Group (PM vs GM) * BDHI_Assault	7.885	1	**.005**
Age	4.067	1	.044
Disorder duration	.914	1	.339

	Wald Chi-Square	Type III df	p-value
(Intercept)	18.679	1	.000
BDHI_Indirect Aggress.	14.676	1	.000
Group (PM vs GM)	5.122	1	.024
Group (PM vs GM) * BDHI_Indirect Aggress.	5.671	1	**.017**
Age	4.113	1	.043
Disorder duration	.514	1	.474

	Wald Chi-Square	Type III df	p-value
(Intercept)	17.641	1	.000
STAXI_Angry reaction	8.812	1	.003
Group (PM vs GM)	7.820	1	.005
Group (PM vs GM)* STAXI_Angry reaction	6.322	1	**.012**
Age	2.596	1	.107
Disorder duration	.273	1	.602