Mental States Task (MST): Development, Validation, and Correlates of a Self-Report Measure of Mentalization

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Objectives: Mental states refer to the quality of one's capacity to mentally elaborate and open up to his or her subjective experience. The Mental States Task (MST) was developed to evaluate individual differences relative to this capacity. **Method:** Using the MST, participants described a story from an emotionally challenging image and responded to a set of items about their cognitive and emotional processes while completing the task. The validation of the French version of the MST comprises two samples: 264 undergraduate/graduate students with a mean age of 27.27 years (Sample 1), and 206 students with a mean age of 26.61 years (Sample 2). The validation of the English version of the MST also includes two samples: 110 undergraduate students with a mean age of 20.15 years (Sample 3) and 188 students with a mean age of 20.90 years (Sample 4). **Results:** Results suggest that 6 mental states can be distinguished and that the MST presents an adequate factorial structure, in both its French and English versions. The MST scores were associated with mental state scores derived from a content analysis method and with other related constructs (e.g., authenticity, empathy). **Conclusions:** Overall, findings provide convincing evidence of validity and reliability for the MST as an assessment tool of mental states. This innovative measure is likely to facilitate the clinical and empirical investigation of mentalization. J. Clin. Psychol. 00:1–25, 2012.

Keywords: mental states; mentalization; emotional regulation; mental elaboration; Mental States Task (MST)

Background

Mentalization refers to a process of mental representation, elaboration, and interpretation of one's and others' mental contents (e.g., beliefs, motives, emotions, intentions, desires, and needs) and of openness towards these (e.g., Bateman & Fonagy, 2004; Bouchard & Lecours, 2008; Fonagy, 2008). Such a process facilitates accurate inferences about one's and others' subjective experience that underpin everyday behaviors, to make sense of those behaviors. Mentalizing thus helps to organize the subjective experience elicited by encountered situations.

The mental states model (Bouchard, Audet, Picard, Carrier, & Milcent, 2001; Bouchard et al., 2008) is an empirical model of mentalization that has recently been developed. According to this model, the different qualities of mentalization are determined by differences in one's *mental states*—that is, one's attitudes toward one's own and others' subjective experience in the here-and-now moment. The quality of mental states is believed to depend on (a) a register of mental representations sensitive to cues from the body and the environment and (b) a modulator system. More precisely, a situation encountered is assumed to trigger specific clusters of mental representations that get activated in memory, as well as their associated affective components (Ferguson & Bargh, 2004; Gawronski & Bodenhausen, 2006; Hofmann, Friese, & Strack, 2009; Philippe, Lecours, & Beaulieu-Pelletier, 2009). These activated clusters of mental representations differ in their level of elaboration (i.e., a high or low number of representations and associations, more or less densely connected).

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A second process serves regulatory purposes by modulating one's degree of conscious openness to the content of the mental representations activated and to their related affective components. Different defensive and regulatory strategies can be used to limit one's openness to the potentially threatening affective and representational contents (e.g., inhibiting, restraining, or reappraising the subjective experience).

These two processes—representation/elaboration and openness/modulation—are part of several theoretical and empirical models (e.g., Gawronski & Bodenhausen, 2006; Hofmann, Friese, & Strack, 2009; Smith & DeCoster, 2000). These models share the general assumption that one mental process is largely in charge of the automatic activation of mental representations and their associated affective components, while another secondary process modulates their activity level. The interactions between these two processes can yield different mental states that are theoretically identified according to an increasingly reflective continuum ranging from low- to high-mental state quality (Bouchard et al., 2001): concrete thinking, low defensive level, intermediate defensive level, objective-rational, high defensive level, and reflective thinking.

Concrete Thinking

Concrete thinking represents an important defect in representation and elaboration of the subjective experience (e.g., few mental representations and associations) in that there is a lack of connection to emotional experiences and low awareness of one's mental contents. The person does not necessarily defend himself against emotional and mental contents, but does not possess the adequate level of representational capacities to interpret and integrate them.

Low Defensive Level

The subject is emotionally overwhelmed by his or her activated representational contents and unable to make sense of it. The subjective experience is perceived as threatening, preventing the person from an adequate elaboration of and openness to the experience. The mental contents are defended against through immature defenses (e.g., splitting, distortion, acting out), which are usually associated with the borderline personality organization or with psychological (e.g., Nickel & Egle, 2006; Perry & Hoglend, 1998) and interpersonal maladjustment (e.g., Bullitt & Farber, 2002; Ungerer, Waters, Barnett, & Dolby, 1997).

Intermediate Defensive Level

The recognition and elaboration of the representational contents are impeded as the person obliterates a part of his or her subjective experience or downplays the personal meaning and emotional expression of a recognized experience. Defenses of denial, minimization, disavowal, or emotional suppression are used to deal with the experience. These kinds of defenses involve failure to acknowledge one's and others' distressing emotions and difficulties, which leads to interpersonal maladjustment (Gross & John, 2003; Ungerer et al., 1997).

Objective-Rational

The subjective experience is treated with an objectifying attitude (third-person perspective). Although there is some recognition and elaboration of the representational contents at play, the person takes distance from his or her subjective experience. The main focus is on objective and external facts and situations (public and observable aspects) and not on the emotional, private, and subjective aspects. This emotional distance can be beneficial, such as when observing and analyzing one's and others' experience in a neutral or objective manner, which could be adaptive in some contexts (e.g., problem solving, intellectual tasks). However, it may also impoverish one's interpersonal relationships and lead to an impaired empathic connection.

High Defensive Level

A first movement of elaboration and openness to the true subjective experience is present, but defended against in a second movement of retraction, using more mature defenses (e.g., repression, reaction formation, undoing, altruism) and adaptive emotional regulation strategies such as reappraisal (e.g., a positive reevaluation of a difficult experience or a happily ending story (King, Scollon, Ramsey, & Williams, 2000). Mature defense mechanisms have been shown to predict reduced psychological symptoms (e.g., Bouchard et al., 2008; Dauphin et al., 2010; Perry & Hoglend, 1998; Vaillant, 1992) and enhanced psychological and physical well-being (e.g., Vaillant, Bond, & Vaillant, 1986; Vaillant, 1992).

Reflective Thinking

Reflective thinking is the capacity to recognize, elaborate, and be aware of and moved by the full subjective experience of the moment, of either the self or the other. It relies on some level of metacognitive capacity, including self-reflection and self-understanding. Expression of emotions are toned down, clear, and differentiated. Reflective thinking is associated with a relative absence of immature defenses and with some use of mature defensive and emotional regulation strategies (e.g., self-observation, anticipation, humor).

Overall, concrete thinking and low defensive level and intermediate defensive level mental states represent "lower" mental states according to the reflective continuum, as they are all expected to be associated with less mature and less adaptive consequences. Conversely, high defensive level and reflective thinking represent "higher" mental states, as they are expected to be associated with more mature and adaptive consequences. The objective-rational mental state falls in-between these two broad categories, being associated with both adaptive and less adaptive consequences depending on the characteristics of the situation encountered.

One construct that is closely related to mental states is that of defense mechanisms. However, three aspects distinguish these constructs. First, some mental states do not involve defense mechanisms per se. Concrete thinking, for instance, involves no particular defense mechanism, but rather a defect in one's representational capacities.

Second, mental states transcend defense mechanisms; they may be tainted by defense mechanisms, but they also reflect several other psychological processes. For instance, mental states include both the quality of the activated mental representations and the modulation of these representations. Defense mechanisms do not reflect the quality of mental representations, as they only become operative to help the person protect against self-threatening mental contents (e.g., Cramer, 1998; Davidson & MacGregor, 1998). In addition, the modulation activity includes not only defense mechanisms but also the effect of coping and emotional regulation processes, along with the person's current mindset with respect to the situation encountered. Therefore, mental states result from various psychological processes and reflect one's *mental organization* relative to the situation encountered.

Third, mental states are situation-based, whereas defense mechanisms are typically measured as a general tendency or dispositional concept (Chaplin, John, & Goldberg, 1988; Cramer, 1998; Davidson & MacGregor, 1998). Indeed, mental states correspond to one's immediate mental attitude toward a precise situation or theme (e.g., a tendency to be emotionally overwhelmed and to use splitting when confronted with the theme of loss), whereas defense mechanisms represent one's general defensive style (e.g., using splitting across diverse situations). As such, mental states may reflect general defense mechanisms actualized in a situational context, while still representing a different construct.

Mental States Rating System

Derived from the mental states model, the Mental States Rating System content analysis (MSRS; Bouchard et al., 2001) was developed to measure these mental states (for a review on the development of the MSRS, see Bouchard et al., 2008). The MSRS is a content analysis method that identifies the six main mental states described above within written material or transcriptions

of spontaneous reactions to various situations (Goldfeld et al., 2008). Mental states are inferred from the material by experts and scored according to criteria corresponding to each mental state category (see Bouchard et al., 2001).

In one study, participants at risk of developing alcoholism were classified with the MSRS as either predominantly reflective or nonreflective. Scores on the Wisconsin Card Sorting Test suggested that the reflective group presented better impulse control and presumably superior executive functions relative to the nonreflective group (Lepadatu, 2003). Other studies using the MSRS revealed that the quality of mental states was negatively associated with psychological symptoms in clinical and nonclinical populations (Bouchard et al., 2008; Dauphin et al., 2010) and with childhood trauma (Dauphin et al., 2010). Finally, a recent study indicated that the quality of mental states was moderately positively associated with emotional intelligence, including social functioning, social skills, empathy, stress tolerance, and impulse control (Tremblay, Bouchard, Lecours, & Beaulieu-Pelletier, 2011).

Although the MSRS is a rich and promising method to measure mental states, it presents some disadvantages in its application. Indeed, the MSRS scoring method requires judges with competent clinical judgment (including reflectivity) and extensive training (more than 50 hours of training with experienced judges). In addition, the rating is time-consuming in that every sentence and discourse sequence needs to be coded from extensive written material or interviews transcribed verbatim. These issues limit the accessibility of this measure to both researchers and clinicians and point to the necessity to create a more practical instrument.

A first attempt to develop a self-report questionnaire based on the mental states model was made by Goldfeld and colleagues (2008). Although convergent correlation indices between the original observer-rated MSRS and the self-report assessment were partially encouraging, this self-report measure was designed for psychotherapists, thus supposing some basic mentalizing capacity and the use of a highly specialized language. The purpose of the present study was to create a new self-report instrument evaluating mental states that would be suitable for the general population.

Such an instrument would be particularly useful in clinical settings, notably for patients' diagnosis and evaluation (e.g., evaluation of therapeutic indications and progresses; understanding of the patient's mental functioning; identifying the potential repercussions of the mental states endorsed). It could also prove very useful for clinicians (e.g., self-evaluation of one's own psychic functioning relative to different issues; evaluation of these issues and of their evolution in supervision/formation; exploration of therapeutic impasses according to the mental states held by the clinician during sessions). Two studies were thus conducted to create and validate a practical task and a self-report to measure mental states modalities, both in French (Study 1) and in English (Study 2).

Study 1

The purpose of Study 1 was to develop a task, called the Mental States Task (MST), based on the mental states model and the MSRS content analysis. Exploratory and confirmatory factor analyses were used to validate the factorial structure of the MST. In addition, scores obtained with the original MSRS content analysis were compared with those obtained with the MST. It was hypothesized that these scores would be moderately positively associated. Convergent validity was further assessed with measures of openness to subjective experience (authenticity, mindfulness, and empathy), defense mechanisms, emotional dysregulation (alexithymia), psychological adjustment (psychological and physical symptoms, life satisfaction, self-esteem, and borderline traits), and quality of emotional experiences (emotional traits, emotions elicited after the MST completion, and enjoyment of the task).

It was hypothesized that *concrete thinking* would be negatively associated with openness to experience, reflective emotions elicited by the task (e.g., interest), and enjoyment of the task, as concrete thinking presents a lack of connection with conscious emotional experiences and a low awareness of mental contents. Concrete thinking was not expected to be associated with any specific types of defense.

Low defensive level was anticipated to be negatively associated with openness to experience and psychological adjustment (as one may be aware of and moved by one's experience, but with too much intensity—the experience being perceived as overwhelmingly threatening, eventually preventing one from opening entirely to the experience) and to be positively related to immature defenses, negative emotional traits, and elicitation of negative emotions.

Intermediate defensive level was expected to be negatively related to openness to experience (as a part of the subjective experience is obliterated or the personal meaning and emotional expression of a recognized experience is downplayed) and positively related to the immature defense of distortion (e.g., denial).

It was hypothesized that *objective-rational* would be mostly negatively associated with openness to experience variables and positively associated with a preference for external thinking style and the mid-level defense of intellectualization, as the experience is treated with an objectifying attitude which introduces a distance from the emotional and subjective aspects of situations.

High defensive level was expected to be weakly positively associated with openness to experience (because of the first movement of elaboration and openness to the true subjective experience that is present, but defended against in a second movement of retraction) and moderately positively with mature defenses and psychological adjustment.

Reflective thinking was anticipated to be moderately positively related to openness to experience, along with elicitation of reflective emotions (because of the capacity to recognize, elaborate, and be interested in and moved by the full subjective experience of the moment). Reflective thinking was also expected to be positively related to the use of mature defenses because the measure used in the present study to assess mature defenses mostly represented adaptive regulatory strategies (i.e., self-observance, self-assertion, and anticipation). These adaptive strategies were anticipated to be beneficial for the reflective process.

Method

Participants

Two samples of participants were recruited from a French Canadian university. Sample 1 comprised 264 undergraduate/graduate students from various departments (197 females, 67 males); mean age was 27.27 years (standard deviation [*SD*] = 6.89). Sample 2 comprised 206 undergraduate/graduate students (154 females, 52 males); mean age was 26.61 years (*SD* = 6.36). Participants in each sample completed the MST, but not the same convergent measures, given the high number of different measures used in this study.

Measures (Samples 1 and 2)

MST. The MST was created for the present study to assess mental states. The 3BM card of the Thematic Apperception Test (TAT; Murray, 1943/1971) was used to prime participants with a conflicting psychological challenge. This image depicts the huddled form of a person (age and sex unclear) lying on the floor against a couch with his or her right arm bowed around the head. Beside the person, there is a revolver on the floor (blurred, so it is frequently seen as a set of keys or it remains unnoticed). Research has shown that similar paintings or images can be used to successfully prompt automatic emotion regulation strategies (e.g., Gyurak, & Ayduk, 2007; Downey, Mougios, Ayduk, London, & Shoda, 2004). Thus, the 3BM card seems appropriate to set up an appropriate context to examine the process of mentalization and mental states.

This image was shown to evoke themes related to the loss of a relationship and depressive experiences and emotions (Aronow, Altman, & Reznikoff, 2001), themes that are central in human life and preponderant in clinical psychology (e.g., Monroe, Rohde, Seely, & Lewinsohn, 1999). However, its ambiguity makes it so that the participant is only primed with such themes and not necessarily monopolized by a conscious and strong experience of these themes. Participants were asked to write down a story that came to mind in response to the image. They were also asked to describe what occurred in their story, what led to the event, what the protagonists felt

and thought, and how their story ended. Participants were asked to provide sufficient detail and a minimum length of text so that we could fully understand their story.

Next, participants responded to items assessing their mental states during the previous task. The instructions were as follows: *The following items refer to how you felt during the previous task. While you were doing the previous task (i.e., while you were looking at the picture, thinking about a story and writing your story), to what extent did you find yourself in each of these following mental states?* In previous pilot studies (Beaulieu-Pelletier, 2012), a large pool of 92 items was generated that was meant to encompass all the mental states covered by the MSRS. The items were formulated as reflecting the conscious activity resulting from the person's representational capacities and defensive functions elicited by the task. In other words, items are not based on one's capacity to observe and be aware of one's mental states during the task (e.g., *I have defended myself thinking that what the character was going through was not that bad*), but rather on one's conscious activity resulting from the attitude endorsed during the task (e.g., *I thought that what the character was going through was not that bad*). Consequently, defensive strategies and low introspective abilities can be reasonably avoided.

Four versions of the MST items have been created in these pilot studies to obtain the final version of the MST. Using both rational and empirical methods (e.g., expert categorization, descriptive statistics, item analyses, factorial analyses), the scale was reduced to its present final form comprising 24 items (see Table 1). In line with the mental states theoretical framework, the final form of the MST measures a set of six mental states, each assessed with four items: concrete thinking (CONC), low defensive level (LoDef), intermediate defensive level (IntDef), objective-rational (OBR), high defensive level (HiDef), and reflective thinking (REF). Items were responded to on a 7-point Likert scale ranging from 1 (*completely disagree*) to 7 (*completely agree*).

Scores for each mental state were obtained by averaging the four items of each subscale. A total score was also calculated. To this end, the raw score of each subscale was multiplied by a weight reproducing the reflective continuum: CONC (*1), LoDef (*1), IntDef (*1), OBR (*2), HiDef (*3), and REF (*3). "Lower" mental states (CONC, LoDef, and IntDef) were indexed by a lower score than "higher" mental states (HiDef and REF). However, because IntDef, for instance, is not expected to lead to more adaptive consequences than CONC and LoDef, these three mental states were indexed by the same score. HiDef and REF were also indexed by the same score as they are equally likely to lead to adaptive consequences. The OBR mental state falls in between these categories. Consequently, it was indexed by an intermediate score.

Next, each score was summed and divided by the total sum of the raw scores. The total MST equation is expressed as follows: Total MST = (CONC*1 + LoDef*1 + IntDef*1 + OBR*2 + HiDef*3 + REF*3) / (CONC + LoDef + IntDef + OBR + HiDef + REF). The higher the total MST score, the more reflective the overall level of mental states functioning is presumed to be. Such a scoring procedure has been used with success in past studies measuring overall level of defensive functioning (e.g., Perry & Hoglend, 1998).

MSRS. The MSRS described in the Introduction section was used to rate the mental states actualized in the written stories. The MSRS was scored according to a 0 to 100 scale (0 = CONC to 100 = REF). In the present study, 100 protocols randomly selected from Samples 1 and 2 were rated. Two judges, blind to the participants' scores on the other measures, rated 50% of the protocols ($n = 50$). The first judge (first author) coded the remainder of the material (total $n = 100$). These judges were trained by the second author, an experienced clinical psychologist, who developed the MSRS. Interrater reliability for the first half of the material was satisfactory, with an intraclass correlation coefficient of .70.

Sample 1 Measures

The convergent measures chosen in the presents studies were used because of their capacity to capture different facets of mental elaboration and/or of openness to subjective experience—awareness of, interest in, and recognition of one's or others' inner life, defensive and emotional

Table 1
Varimax Rotated Factor Loadings: Study 1

	MST Item	Varimax rotated factor structure					
		1st	2nd	3rd	4th	5th	6th
Conc1	I did not have much to write about.	**.88**	−.02	−.11	.03	−.06	.10
Conc2	I was not very inspired.	**.75**	.02	−.10	.06	−.20	.02
Conc3	The image was not telling me much.	**.67**	−.01	−.04	.16	−.18	.11
Conc4	The material did not inspire any particular thoughts.	**.61**	.05	−.07	.24	−.31	.07
LoDef1	I was afraid of what I was feeling.	−.08	.06	**.74**	.03	−.13	.02
LoDef2	I was afraid of the state I would be in once I would have completed the task.	−.16	.12	**.72**	.02	−.12	.06
LoDef3	I loved and hated the character.	−.04	−.10	**.64**	−.06	.03	.01
LoDef4	I saw or I thought about horrible, scary things.	.00	−.09	**.58**	.05	.11	−.25
IntDef1	I thought that what the character was going through was not that bad.	.24	.20	−.15	.10	−.01	**.65**
IntDef2	The character amused me.	−.14	.06	−.04	.05	.04	**.50**
IntDef3	I did not see any particular problem in the character's situation.	.21	−.10	−.11	.18	−.08	**.44**
IntDef4	I found the character ridiculous to be affected that way.	.14	.04	.26	.05	−.07	**.40**
Obr1	I was mostly trying to focus on well structuring the story's facts and their sequence.	.01	−.02	.09	**.77**	.11	.15
Obr2	I was mostly trying to organize my thoughts well.	.07	.10	.00	**.64**	.15	−.03
Obr3	I was focused on the facts and events of the story, like a detached observer.	.18	−.02	−.09	**.52**	−.10	.06
Obr4	I was writing in a journalistic manner (ex: reporting the facts, the events that occurred, the characters, etc).	.12	.11	.05	**.51**	−.04	.31
HiDef1	I thought that the situation experienced by the character was difficult, but that things always settle down.	.04	**.80**	−.08	−.06	.17	.05
HiDef2	I was repeating to myself that with time things would return to normalcy for the character.	.01	**.74**	.07	.01	.15	.03
HiDef3	I told myself that what the character was experiencing was difficult, but that he/she would not stay in this specific situation or position for a long time.	−.02	**.73**	−.01	.00	.16	.05
HiDef4	Although the character's situation was difficult, I felt the need to end my story in a positive way, so that I did not dwell on the negative.	−.02	**.64**	.01	.18	.00	.08
Ref1	The character's situation moved me, but I was not overwhelmed with sadness.	−.18	.27	.05	.02	**.67**	−.06
Ref2	I was touched by what the character was experiencing, without being distressed.	−.24	.13	−.09	.02	**.63**	−.02
Ref3	I was becoming aware of what was happening inside myself (thoughts, sensations, etc).	−.27	.17	.29	−.21	**.42**	−.07
Ref4	The task triggered in me feelings that I was easily able to manage.	−.08	.06	−.10	.11	**.41**	.01

Note. MST = Mental States Task. Study 1: $n = 232$ (176 females, 56 males) randomly selected from samples 1 and 2. Factors loadings equal to or greater than .40 appear in bold. Conc = Concrete, LoDef = Low defensive level, IntDef = Intermediate defensive level, OBR = Objective-rational, HiDef = High defensive level, Ref = Reflective.
To obtain the French version of the MST items, see author notes for correspondence modalities.

regulation strategies, attitude toward emotions, and psychological and physical adjustment as a result of one's mental functioning.

Authenticity functioning. The French translation (Philippe & Beaulieu-Pelletier, 2010) of the Authenticity Inventory (AI-3; Kernis & Goldman, 2006) comprises 45 items divided in four components. *Awareness* refers to the awareness of one's motives, feelings, and cognitions. *Unbiased processing* is defined as *not* denying, distorting, or exaggerating internal experiences and externally based self-evaluative information. *Behavioral authenticity* corresponds to acting in coherence with one's values, preferences, and needs, and not acting *falsely*. *Relational orientation* refers to valuing and achieving openness and truthfulness and to being genuine and not *fake* in close relationships. A global score of authentic functioning combines scores on these four components. (See Table 3 for the Likert scale points and alpha coefficients of all scales.)

Mindfulness. The French version (Beaudry, 2010) of the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) was used to assess mindfulness, defined as an enhanced attention to and awareness of current experience. In this 15-item scale, higher scores reflect higher levels of dispositional mindfulness.

Defense mechanisms. A total of 17 items from the French version of the Defensive Style Questionnaire (DSQ-60; Trijsburg, Bond, Drapeau, Thygesen, & De Roten, 2005) were used to measure five types of defense mechanisms. These five types of defenses were splitting (e.g., ambivalence about representations of the self and representations of others), major reality distortion (e.g., denial), intellectualization (e.g., distancing from one's emotionality), altruism (e.g., seeking to help other people), and adaptive defenses (e.g., self-observance, self-assertion, anticipation), with adaptive defenses representing the highest level of defense maturity and splitting corresponding to the lowest one. A confirmatory factor analysis (CFA) has shown adequate factorial structure for these 17 items in previous work (Philippe et al., 2012).

Psychological symptoms. The French version (Fortin, Coutu-Wakulczyk, & Engelsmann, 1989) of the short scale of the Symptom Checklist-10-Revised (SCL-10R; Rosen et al., 2000) was used to assess various psychological symptoms. The SCL-10R comprises 10 items and correlates at .95 with the full 90-item original scale. Participants were asked to rate the extent to which they have been bothered by each symptom during the last month.

Life satisfaction. The French version (Blais, Vallerand, Pelletier, & Brière, 1989) of the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item scale measuring general happiness with one's life.

Explicit self-esteem. The one-item self-esteem measure of Robins, Hendin, and Trzesniewski (2001), "I have high self-esteem," was used in this study. This item has been shown to display high test-retest reliability, high correlations with commonly used self-esteem measures (e.g., correlations between .70 and .80 with the Social Behaviour Inventory and the Rosenberg Scale), and yields results very similar to the Rosenberg Scale (see Robins et al., 2001).

Sample 2 Measures

Empathy. The French translation (Mehrabian, 2000) of the Questionnaire Measure of Emotional Empathy (Mehrabian & Epstein, 1972) was used to measure empathic tendency. In the present study, a total of 10 items were selected from the 33-item original questionnaire (e.g., "I tend to get emotionally involved with a friend's problems"). Items were selected for their reference to openness and connection with others' emotions, without tapping into extreme emotional responses and reactions. Items of this latter sort have not been selected, as the present study focuses on adaptive emotional investment (e.g., be moved by others' sadness without feeling completely depressed or dysfunctional).

Task enjoyment. Five items devised for the present study aimed to assess participants' appreciation and constructive emotional impact of the MST: "I found the task interesting," "I liked completing the task," "This task made me feel good," "I enjoyed asking myself all these questions related to the task," and "Being in contact with the thoughts and feelings elicited by the task made me feel good." These items were averaged into an enjoyment index.

Alexithymia. The French version (Loas, Otmani, Verrier, Fremaux, & Marchand 1996) of the 20-item Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) includes three factors: factor 1 assesses *difficulties in identifying feelings* and distinguishing them from bodily sensations; factor 2 reflects *difficulties describing and communicating feelings*; and factor 3 denotes a preference for *externally oriented thinking style,* in comparison to introspective thought.

Borderline traits. The French translation (Lecours & Philippe, 2009) of the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003) is based on a subset of questions from the borderline module of the Diagnostic Interview for Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) Borderline Personality Disorder (DSM-IV BPD). The MSI-BPD comprises 10 items (one item per DSM-IV BPD criterion, except for the ninth criterion, which contains two items). The scale utilizes a yes (1) or no (0) response format. Each endorsed item is worth one point on a scale ranging from 1 to 10.

Physical symptoms. The French version (Beaulieu-Pelletier & Philippe, 2010) of the Physical Health Questionnaire (PHQ; Schat, Kelloway, & Desmarais, 2005) comprises 14 items evaluating the frequency with which one experiences sleep disturbances, headaches, respiratory infections, and gastrointestinal problems.

Positive and negative emotions. The French adaptation (Lapierre, Gaudreau, & Blondin, 1999) of a short version of the Positive and Negative Affect Schedule (PANAS; Thompson, 2007) was administered to assess emotions. This short version comprises five positive (active, alert, determined, attentive, inspired) and five negative (afraid, nervous, upset, ashamed, hostile) emotional items. Five items assessing reflective experience (interested, calm, enthusiast, contemplative, curious) were added to form an emotional reflective subscale. Two measurement moments were used: (a) At the beginning of the experiment, to assess trait-like affectivity (*In general, to what extent do you feel each of these emotions*) and (b) right after the completion of the MST, to assess emotional reactions elicited by the task (Time 2: *How do you feel at the present moment*).

Social desirability. The French version (Tremblay, Lachance, & Richer, 2006) of the short Marlowe-Crowne Form C (Reynolds, 1982) was administered to assess the tendency to distort self-presentation toward a socially desirable bias. This 13-item scale utilizes a true-false response format. Higher scores on the scale correspond to a higher social desirability tendency.

Procedure

Participants were randomly contacted through their institutional e-mail and explained that we were conducting an online study about personality. The incentive was that their participation allowed them to be entered into a draw of three prizes of $125. Participants in Sample 1 completed the AI-3, MAAS, DSQ, SCL-10R, Satisfaction with Life Scale, the self-esteem item, and finally the MST. Participants in Sample 2 completed the PANAS (in general), Questionnaire Measure of Emotional Empathy, TAS-20, MSI-BPD, PHQ, Marlowe-Crowne, MST, task enjoyment items, and finally the PANAS (at the present moment).

Results

Factorial Structure

An exploratory factor analysis, using principal axis factoring as the method of estimation, was performed on the 24 items of the MST with varimax rotation. This analysis was conducted on a random selection of 50% of the participants from Samples 1 and 2 ($n = 232$). Results revealed six factors with an eigenvalue higher than one (4.19, 3.25, 2.50, 1.95, 1.53, and 1.17). In addition, examination of the scree test (i.e., the point where the decline in eigenvalues starts to level off) showed six clear factors. Each item loaded on its respective factor (see Table 1) and their factor loadings ranged from .40 to .88.

A CFA was performed on the remaining half of the participants ($n = 236$) to confirm the factorial structure of the MST. The model included six latent variables (CONC, LoDef, IntDef, OBR, HiDef, and REF), each comprised four observed variables (i.e., items). Fit indices for this model using LISREL 8.8 (Jöreskog & Sörbom, 2003) and robust maximum likelihood as the method of estimation were satisfactory: Satorra-Bentler c2(degree of freedom [*df*] = 237, $n = 236$) = 375.79, $p < .000$; normed chi-square (c2/*df*) = 1.59; non-normed fit index (NNFI) = .93; comparative fit index (CFI) = .94; root mean square error of approximation (RMSEA) = .049 [.040; .059]; standardized root mean square residual (SRMSR) = .069; Akaike information criterion (AIC) = 501.79.

Figure 1 illustrates the factor loadings of each mental state and the intercorrelations among the latent variables. All factor loadings ranged from .47 to .82. Alternative factorial models were also tested based on some theoretical concerns. One alternative model consisted in merging REF and CONC to examine if those two dimensions were not just the opposite of each other. Other alternative models examined whether CONC and IntDef, CONC and OBR, IntDef and OBR, LoDef and REF, HiDef and OBR, or HiDef and REF could be combined. Results for all of these alternative models revealed less adequate fit indices, all *SB* c2($df = 242$, $n = 236$) > 490.89, AICs > 589.57, thus suggesting that the original model should be preferred.

Table 2 reports the means, standard deviations, and correlations of all six mental states for Samples 1 and 2 (total $n = 471$). Opposed mental states were negatively associated with each other (e.g., CONC and REF), whereas mental states that share some characteristics were positively correlated (e.g., CONC, IntDef, and OBR).

Reliability

Reliability coefficients were .82 (CONC), .69 (LoDef), .62 (IntDef), .70 (OBR), .82 (HiDef), and .66 (REF). The subscales thus show an acceptable degree of internal consistency in light of the fact that they are each composed of only four items.

Gender Differences

t tests were conducted to examine gender differences among all mental states. Results revealed no gender differences on all mental states, except on OBR, $t(469) = 3.83$, $p < .05$, $d = .40$. Men showed higher levels of OBR ($M = 3.75$, $SD = 1.30$) than women ($M = 3.24$, $SD = 1.25$). This predominance of OBR in men has been obtained in previous studies (Normandin & Bouchard, 1993; Lecours, Bouchard, & Normandin, 1995).

Convergent Validity

It was hypothesized that the total MST score would be correlated with the MSRS score. Results supported this hypothesis, as the total MST score was moderately positively associated with the MSRS score ($r = .45$, $p < .05$). A very high correlation was not realistically expected between the MST and the MSRS scores, as instruments assessing the same construct with different methods (self-report versus observer-rating) usually correlate moderately with each other. These findings suggest that the MST adequately assesses mental states as described by the mental states model.

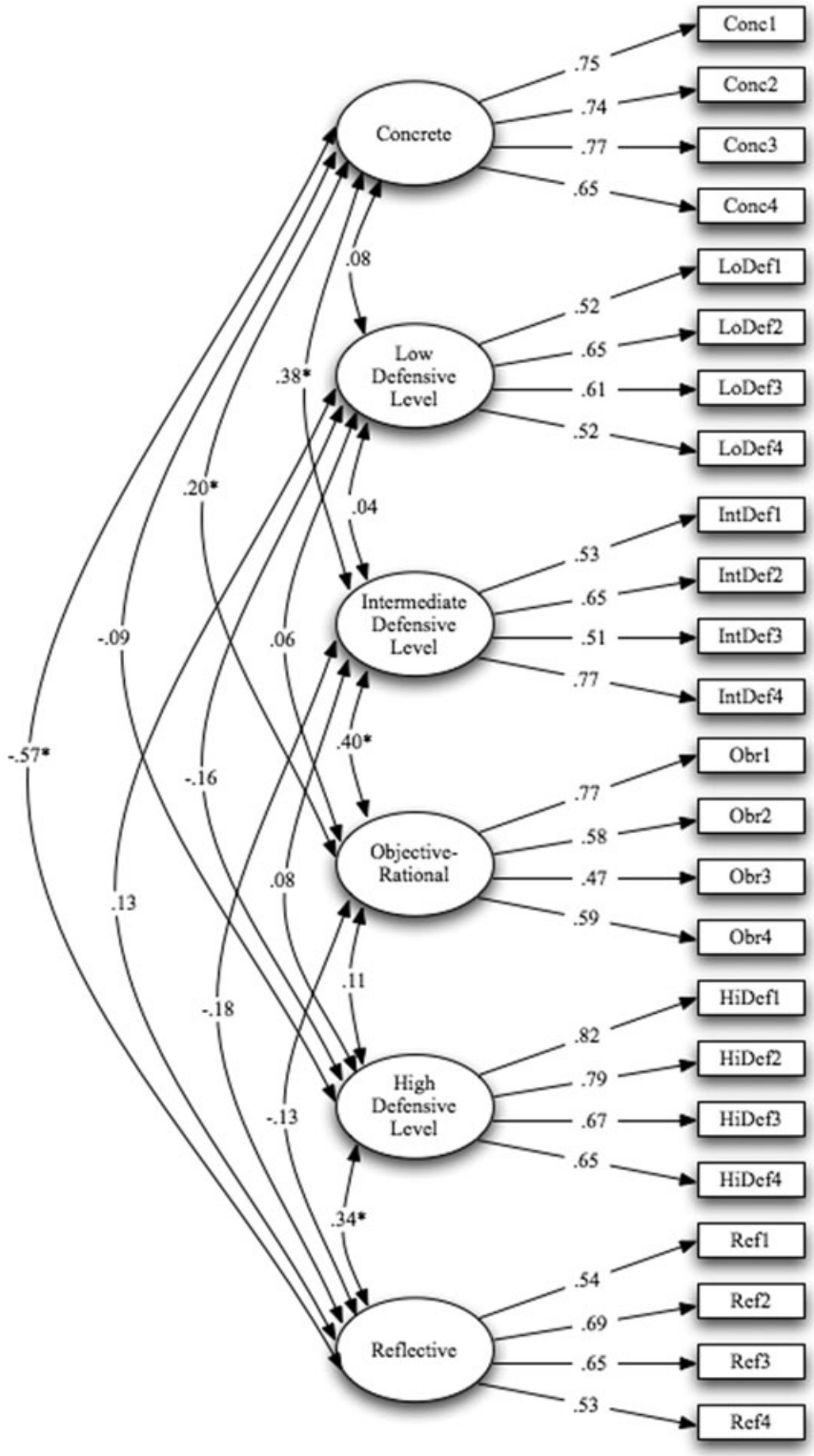

Figure 1. Confirmatory Factor Analysis using Robust Maximum Likelihood.
Note. $n = 236$ randomly selected from samples 1 and 2.

Table 2
Means, Standard Deviations, and Correlational Results Among Mental States Modes: Samples 1 and 2

	Mean (SD)									
	Females	Males	t	d	1	2	3	4	5	6
CONC (1)	2.92 (1.44)	2.97 (1.37)	−0.37	.04	–					
LoDef (2)	1.79 (.99)	1.93 (.99)	−1.33	.14	−.10*	–				
IntDef (3)	2.07 (1.09)	2.25 (1.04)	−1.63	.17	.23**	−.10*	–			
OBR (4)	3.24 (1.25)	3.75 (1.30)	−3.83**	.40	.18**	.01	.24**	–		
HiDef (5)	4.11 (1.70)	4.11 (1.68)	−0.02	.00	−.05	−.07	.07	.10*	–	
REF (6)	4.08 (1.31)	3.99 (1.38)	0.64	.07	−.44**	.08	−.07	−.05	.28**	–
Total MST (7)	2.08 (.19)	2.05 (.20)	1.51	.16	−.66**	−.21**	−.36**	−.15**	.57**	.69**

Note. Based on Samples 1 and 2 combined. $n = 470$ (351 females, 119 males). CONC = Concrete, LoDef = Low defensive level, IntDef = Intermediate defensive level, OBR = Objective-rational, HiDef = High defensive level, REF = Reflective, Total MST = total score on MST.
*$p < .05$. **$p < .01$.

Table 3 reports the correlations among mental states and related constructs for Samples 1 ($n = 264$) and 2 ($n = 207$). First, one possible concern is the degree to which the MST correlates with social desirability. The correlations between mental states and social desirability ranged from –.22 to .12, with only one significant correlation: LoDef, $r = –.22$, $p < .05$. This indicates that the results obtained from the MST do not seem to be characterized by social desirability biases.

Openness to subjective experience. Results broadly suggest that CONC and LoDef were negatively associated with openness to subjective experience. IntDef and OBR were unrelated or negatively related to openness to experience variables (negative correlations with empathy for both IntDef and OBR, and negative correlations with some authenticity variables for OBR). HiDef was associated with empathy and authentic relationships, but unrelated to the other openness variables. Finally, REF was mostly positively associated with the openness to subjective experience variables. A particular consideration regarding these results concerns the relatively low correlations obtained with mindfulness. This might potentially be explained by the fact that the measure assessing mindfulness (MAAS) used in the present study only taps the attention/present focus aspect of mindfulness, but not other features of mindfulness such as acceptance and nonjudgment—features that could potentially be more highly correlated with certain mental states.

Emotional dysregulation. Results showed that CONC was unrelated to the three alexithymia factors and that LoDef was positively related to the alexithymia factors representing difficulty identifying and describing emotions. Both IntDef and OBR were positively related to the alexithymia factor representing external thinking style, HiDef was negatively correlated with difficulty identifying emotions, and REF was unrelated to the three alexithymia factors.

Defense mechanisms. Results revealed a relative absence of adaptive defenses in CONC and LoDef, a moderate positive association between immature defenses and LoDef, the use of intellectualisation in OBR, and of mature defenses in HiDef and REF. Unexpectedly, IntDef was not associated with major distortion defenses, such as denial.

Psychological adjustment. Results broadly revealed that LoDef was associated with poor psychological adjustment, as opposed to HiDef, which was associated with better psychological adjustment. REF in contrast was unrelated to psychological adjustment.

Table 3
Correlational Results Among Mental States Modes and Related Constructs: Samples 1 and 2

	Scale points	Alpha	CONC	LoDef	IntDef	OBR	HiDef	REF	Total MST
Social desirability	0–1	.53	.09	−.22**	.12	.10	.08	−.10	−.03
Openness to subjective experience									
Global authentic functioning	1–5	.89	−.15*	−.37**	.06	−.10	.09	.21**	.26**
Awareness	1–5	.76	−.09	−.22**	.07	−.02	.08	.16**	.17**
Unbiased processing	1–5	.63	−.16**	−.29**	.08	−.12*	−.05	.22**	.18**
Behavioral authenticity	1–5	.69	−.03	−.41**	.06	−.16**	.03	.07	.15*
Relational orientation	1–5	.77	−.19**	−.27**	.01	−.04	.22**	.21**	.34**
Mindfulness	1–6	.86	−.15*	−.25**	.06	−.06	.06	.12*	.19**
Empathy	1–7	.61	−.18*	.10	−.25**	−.22**	.14*	.19**	.25**
Emotional dysregulation									
Total alexithymia	1–5	.80	.06	.34**	.17*	.07	−.10	−.03	−.23**
Difficulty identifying	1–5	.76	−.01	.43**	.05	−.10	−.16*	.05	−.18*
Difficulty describing	1–5	.80	.10	.20**	.13	.11	−.08	.01	−.17*
Externally thinking style	1–5	.57	.05	.10	.22**	.17*	.04	−.14	−.16*
Defense mechanisms									
Splitting	1–9	.64	−.02	.33**	.01	.08	−.10	−.03	−.13*
Distortion	1–9	.67	−.09	.36**	−.03	.09	.03	.02	−.03
Intellectualisation	1–9	.79	.08	.22**	−.02	.14*	−.02	−.09	−.15*
Altruism	1–9	.64	−.14*	−.03	.01	.08	.21**	.16**	.22**
Adaptive	1–9	.72	−.20**	−.15*	−.01	.06	.20**	.19**	.28**
Psychological adjustment									
Psychological symptoms	1–5	.81	.01	.36**	−.05	.06	−.12*	−.03	−.15*
Physical symptoms	1–7	.84	−.10	.28**	−.03	−.16*	.04	.01	.01
Life satisfaction	1–7	.88	.08	−.26**	.07	−.01	.15*	−.01	.08
Self-esteem	1–7	–	.05	−.22**	.15*	.02	.15*	.09	.09
Borderline traits	0–1	.72	−.14	.27**	−.15*	−.13	−.15*	.09	.00
Emotional experiences									
Emotional traits									
Positive	1–5	.68	−.01	−.06	.12	.11	.01	.03	−.01
Negative	1–5	.70	−.01	.22**	.01	−.11	−.10	.03	−.09
Reflective	1–5	.51	.17*	−.16*	−.01	.01	.10	.07	.05
Emotions elicitation after MST									
Positive	1–5	.75	−.16*	−.04	.16*	.27**	.10	.21**	.15*
Negative	1–5	.68	−.06	.48**	.04	−.10	−.08	.05	−.14
Reflective	1–5	.64	−.21**	−.02	.07	.15*	.18**	.27**	.26**
Enjoyment index	1–7	.88	−.53**	.11	−.09	−.03	.23**	.63**	.56**

Note. MST = Mental States Task. CONC = Concrete, LoDef = Low defensive level, IntDef = Intermediate defensive level, OBR = Objective-rational, HiDef = High defensive level, REF = Reflective, Total MST = total score on MST.
*$p < .05$. **$p < .01$.

Emotional traits and emotional elicitation. Results showed that positive and negative emotional traits were unrelated to all mental states modes, except for the LoDef mode, which was associated with more negative emotions in general. All mental states modes were unrelated to the reflective emotional trait, except the LoDef mode, which was negatively correlated with it and, surprisingly, the CONC mode, which was positively related to it.

Results also revealed that LoDef led to a higher negative emotional elicitation following the MST. IntDef, OBR, and REF were conducive to a higher positive emotional elicitation, and OBR, HiDef, and REF modes promoted a higher reflective emotional elicitation. Of particular interest for CONC is the important decrease in its correlations with reflective emotional traits and reflective emotions elicitation from .17 to –.20, *ps* < .05.

Concerning the enjoyment of the task, results showed that HiDef and REF seem to promote enjoyment of the task, while CONC seems to hinder it.

Study 2

The purpose of Study 2 was to translate the MST from French to English and to further extend its ecological validity to an English population. The factorial structure of the English MST was first examined. Convergent evidence of validity was obtained by replicating some of the most important findings of Study 1 and was expanded with additional related measures of self-attentiveness (rumination vs. self-reflection), emotion regulation (reappraisal vs. suppression), and attitudes toward sadness (denial/disinterest/harmful vs. growth). Peer reports were also added in this study to provide convergent validity indices from a different perspective.

It was hypothesized that CONC would be negatively related to self-reflection and would show low interest in the emotion of sadness. LoDef was anticipated to be positively associated with rumination and with considering sadness as harmful. IntDef was expected to be positively related to the use of suppression and with denial of sadness. It was hypothesized that OBR would be positively associated with the use of strategies aimed at distancing oneself from emotional experiences, such as suppression and denial of sadness, but also with some adaptive strategies like reappraisal. HiDef should be negatively associated with low interest in the emotion of sadness—as a first movement of openness—and positively associated with some adaptive regulation strategies such as reappraisal. Finally, REF was anticipated to be positively related to self-reflection, interest in, and valuing of the emotion of sadness, as well as use of some adaptive regulation strategies such as reappraisal.

Method

Participants

Two samples of English participants were recruited from an English-speaking Canadian university. Sample 3 comprised 110 undergraduate students from various departments (82 females, 28 males). Mean age was 20.15 years ($SD = 3.92$ years). A total of 188 undergraduate students (104 females, 83 males, 1 missing gender value) took part in Sample 4. Mean age was 20.90 years ($SD = 5.22$ years). Again, the convergent measures used were not the same in each sample.

Measures (Samples 3 and 4)

MST. The MST used in Study 1 was translated in English for this study. First, two bilingual English-French contributors translated the MST into English, producing two parallel English versions. Then, both versions were back-translated into French by two other contributors. The similarity between the original French questionnaire and the back-translated French version is a marker of the quality of the intermediary English version. Subsequently, a committee of two bilingual graduate students and a professor of psychology evaluated both English versions according to their readability and concordance with the original version and finally decided upon a final version of the English MST.

Sample 3 Measures

Authenticity, empathy, and borderline traits. These measures were the same as those used in Study 1 (in their respective English versions). See Table 5 for the Likert scale points and alpha coefficients of all scales.

Sample 4 Measures

Self-attentiveness. The Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) was used to assess ruminative and reflective types of private self-attentiveness (24 items). *Rumination* refers to a self-attentiveness motivated by perceived threats, losses, or

injustices to the self (e.g., "I always seem to be rehashing in my mind recent things I've said or done"), whereas *reflection* corresponds to a self-attentiveness motivated by curiosity or interest in the self (e.g., "I love exploring my 'inner' self").

Emotion regulation. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a 10-item scale that assesses two common emotion regulation strategies: cognitive reappraisal and suppression. *Reappraisal* refers to a form of cognitive change that involves construing a potentially emotion-eliciting situation in a way that changes its emotional impact (e.g., "I control my emotions by changing the way I think about the situation I'm in"), whereas *Suppression* corresponds to a form of response modulation that involves inhibiting ongoing emotion-expressive behavior (e.g., "I control my emotions by not expressing them").

Attitudes toward sadness. The Questionnaire on the Attitude Toward the Emotion of Sadness (Lecours & Philippe, 2010) was used to evaluate reactions to situations eliciting sadness. Sadness was used as the target emotion because it is the one mostly expressed in the TAT card used for the MST. Participants were asked to think of their typical reaction when facing a situation that can arouse a state of sadness and to rate to what extent various statements correspond to their habitual reaction (*Generally, when I am in a situation that can arouse sadness . . .*).

Four subscales were selected according to their theoretical relevance to the present study: Denial (four items), Disinterest (three items), Harmful (three items), and Growth (four items). Denial refers to the feeling that one is never or rarely sad, and that life is always beautiful (e.g., "I tell myself that this situation does not affect me because I am never sad"). Disinterest corresponds to a noninterest in understanding about what sadness signals or informs (e.g., "I am not interested in understanding what I am experiencing"). Harmful is defined as perceiving sadness as overly harmful and threatening, as an emotion that should not exist or should exist as little as possible (e.g., "I feel that I hate sadness"). Growth measures the feeling that sadness highlights occasions for personal growth and self-understanding (e.g., "I consider that sadness helps me to better understand myself").

A CFA on the present study data showed that all four factors adequately fit the data, Satorra-Bentler c2 ($df = 71$, $n = 188$) = 109.23, $p < .01$, NC = 1.54, RMSEA = .054 (.032; .073), NNFI = .96, CFI = .97, SRMR = .084, with factor loadings ranging from .45 to .84.

Peer reports. A variety of single items were used to assess a number of peer perceptions relative to the participants. Items were chosen for their clear, face-valid, and simple formulation, and single items were preferred to keep the questionnaire as brief as possible for the peers.

First, peer ratings of the participants' use of suppression and reappraisal strategies of emotional regulation were measured with two items used by Gross and John (2003; Study 3): "My peer controls his or her emotions by not expressing them" and "My peer changes the way he/she is thinking about the situation when he/she wants to feel less negative emotion," respectively. Second, two items were selected from the RRQ (Trapnell & Campbell, 1999) and adapted for close others to assess peer perceptions of ruminative and reflective types of self-attentiveness: "My peer tends to 'ruminate' or dwells over things that happen to him/her for a really long time afterward" and "My peer is very self-inquisitive by nature," respectively. Third, participants' difficulty describing their feelings was assessed with the item "It is difficult for my peer to reveal his or her innermost feelings, even to close friends," derived from the TAS-20 (Bagby et al., 1994). Finally, peer perceptions of the participants' externally oriented thinking style was measured with the item "My peer prefers talking to people about their daily activities rather than their feelings," also derived from the TAS-20.

Procedure

Procedures were the same as those described in Study 1. Participants in Sample 3 were asked to complete the AI-3, Questionnaire Measure of Emotional Empathy, MSI-BPD, and MST. Participants in Sample 4 were asked to complete the RRQ, ERQ, QAFET, and MST. At the end of the questionnaire, participants in the fourth sample were asked if they would agree to

provide the e-mail of a close other who knows them well, to obtain a more complete picture of the participants' personality. They were told that their close other would not have access to the information they provided in this study and that they would not be permitted to see their peer's responses as well, to preserve confidentiality.

Results

Factor Structure

A CFA was conducted on the MST items with participants from Samples 3 and 4 combined. The model comprised six latent variables (CONC, LoDef, IntDef, OBR, HiDef, and REF), each comprised four observed variables (i.e., items). Fit indices for this model using LISREL 8.8 (Jöreskog & Sörbom, 2003) and robust maximum likelihood were satisfactory: Satorra-Bentler $\chi^2(df = 237, n = 298) = 497.40$, $p < .000$; NC = 2.13; NNFI = .89; CFI = .91; RMSEA = .062 (.054; .069); SRMSR = .079; AIC = 629.40.

Figure 2 shows the factor loadings of each mental state and the intercorrelations among the latent variables. All factor loadings ranged from .39 to .83, except for the factor loading of Ref 1, which was at .23, but was still significant. Although the loading of this item was low, results of all analyses were virtually the same when excluding this item. This item was thus kept for the remaining analyses. The same alternative factorial models tested in Study 1 were also tested to examine if some mental states could be combined. Results for all of these alternative models revealed less adequate fit indices than the original model, all $SB\ \chi^2(df = 242, n = 298) > 598.21$, AICs > 721.21, suggesting that the original model should be preferred.

A multisample CFA analysis was conducted to examine whether the English version of the MST differed from the French version presented in Study 1. A first model was conducted with each group tested separately in one run, with all parameters in each group allowed to vary freely. Fit indices for this configural model were adequate: Satorra-Bentler $\chi^2(df = 474) = 869.81$, $p < .000$; NC = 1.84; NNFI = .91; CFI = .92; RMSEA = .057; SRMSR = .069. Next, factor loadings of the French version were constrained to be equal to those of the English version. Fit indices for this constrained model were very similar, SB $\chi^2(df = 492) = 909.69$, $p < .000$, NC = 1.85, NNFI = .91, CFI = .92, RMSEA = .057, SRMSR = .074, but the $\Delta\ \chi^2$ difference test (adjusted for SB scaling) was significant, $\Delta,\chi^2\ (18) = 39.02$, $p < .05$, thus suggesting that some parameters were not fully invariant.

Further examination of these differences revealed that three factor loadings out of 24 were not invariant across the versions. HiDef3 and Obr4 were significantly higher in the French version than in the English version (.70 and .79, vs. .54 and .48, respectively) and IntDef4 was significantly higher in the English version than in the French one (.76 vs. .47). There were no other significant differences when these three parameters were allowed to vary freely across the groups, $\Delta\chi^2\ (15) = 23.72$, $p = .07$. Thus, overall, the differences between the French and the English versions were fairly small.

Table 4 reports the means, standard deviations, and correlations of all six mental states for Samples 3 and 4 combined. As in Study 1, opposed mental states were negatively associated, whereas mental states that share some characteristics were positively correlated.

Reliability

Reliability coefficients were .77 (CONC), .67 (LoDef), .70 (IntDef), .72 (OBR), .79 (HiDef), and .58 (REF), thus showing an acceptable degree of internal consistency.

Gender Differences

t tests revealed no gender differences on all mental states.

Convergent Validity

Table 5 reports the correlations for Sample 3 ($n = 110$) among some of the measures used in Study 1 and the six mental states. Overall, the associations between the mental states and

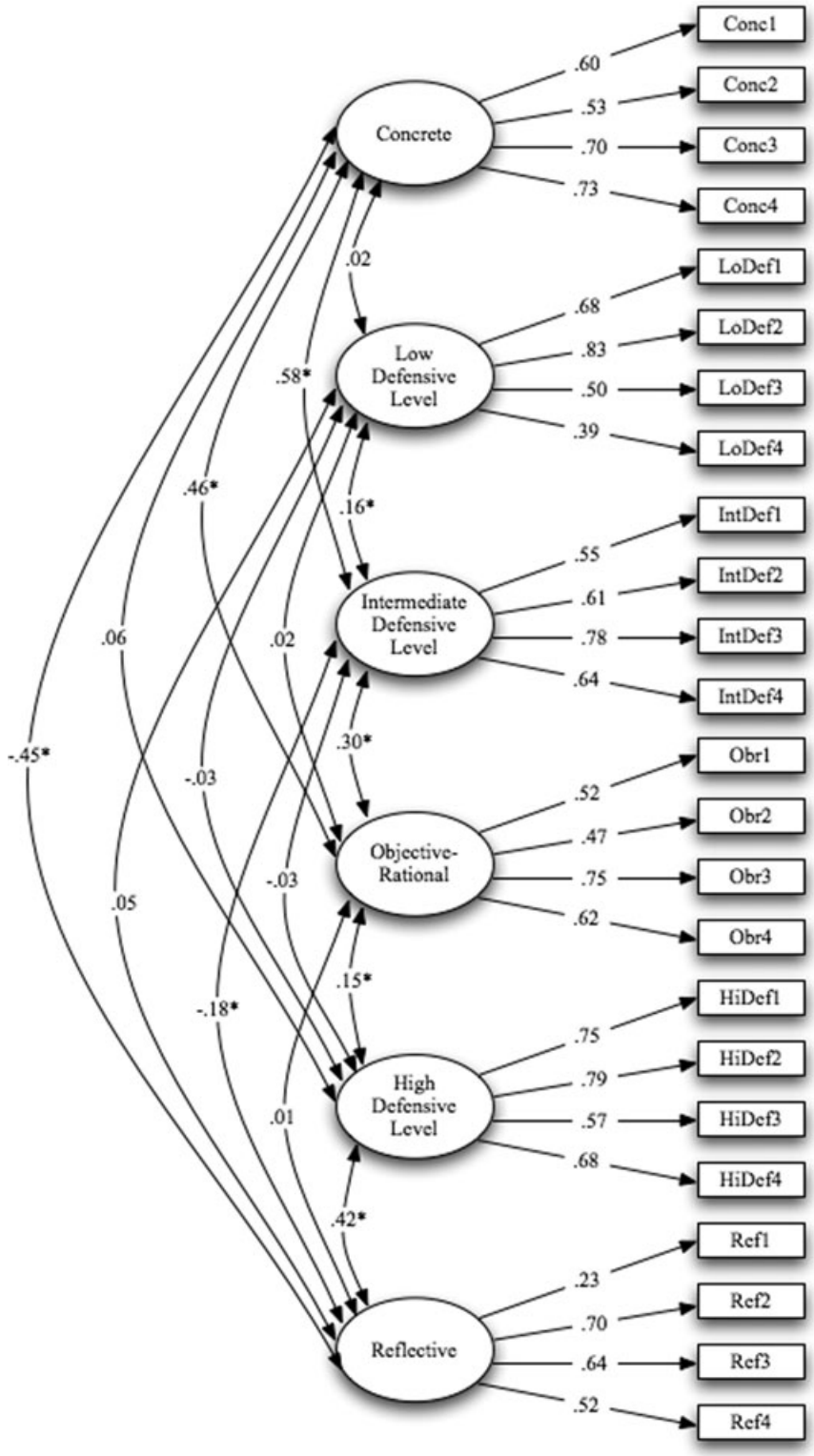

Figure 2. Confirmatory Factor Analysis using Robust Maximum Likelihood.
Note. $n = 298$ from samples 3 and 4.

Table 4
Means, Standard Deviations, and Correlational Results Among Mental States Modes: Samples 3 and 4

	Mean (SD)									
	Females	Males	t	d	1	2	3	4	5	6
CONC (1)	2.72 (1.35)	2.82 (1.33)	−0.58	.07	–					
LoDef (2)	2.24 (1.15)	2.31 (1.09)	−0.54	.06	−.07	–				
IntDef (3)	1.84 (1.02)	2.07 (.98)	−1.85	.23	.36**	.02	–			
OBR (4)	3.09 (1.34)	3.34 (1.27)	−1.54	.19	.33**	.02	.26**	–		
HiDef (5)	3.54 (1.59)	3.69 (1.58)	−0.78	.09	.05	−.04	−.01	.11	–	
REF (6)	4.11 (1.27)	4.21 (1.07)	−0.74	.08	−.25**	.04	−.10	.02	.29**	–
Total MST (7)	2.05 (.20)	2.04 (.16)	0.40	.05	−.54**	−.31**	−.49**	-.16**	.57**	.63**

Note. MST = Mental States Task. *Based on Samples 3 and 4 combined.* $n = 298$ (186 females, 111 males, and 1 missing value). CONC = Concrete, LoDef = Low defensive level, IntDef = Intermediate defensive level, OBR = Objective-rational, HiDef = High-defensive level, REF = Reflective, Total MST = total score on MST.
$^{*}p < .05$. $^{**}p < .01$.

Table 5
Correlational Results Among Mental States Modes and Related Constructs: Samples 3 and 4

	Scale points	Alpha	CONC	LoDef	IntDef	OBR	HiDef	REF	Total MST
Global authentic functioning	1–5	.87	−.16	−.36**	−.18	−.06	.05	.34**	.36**
Awareness	1–5	.73	−.14	−.40**	−.17	.01	.01	.21*	.30**
Unbiased processing	1–5	.63	−.03	−.22*	.02	−.06	−.05	.22*	.13
Behavioral authenticity	1–5	.67	−.14	−.26**	−.18	−.04	.05	.25**	.27**
Relational orientation	1–5	.75	−.16	−.24*	−.22*	−.10	.13	.36**	.40**
Empathy	1–7	.69	−.26**	.02	−.26**	−.25**	.16	.23*	.32**
Borderline traits	0–1	.79	−.11	.31**	−.07	−.19	−.12	−.08	−.13
Emotional regulation									
Rumination	1–7	.90	−.13	.21**	−.22**	−.04	−.01	.04	.06
Self-reflection	1–7	.91	−.18*	.15*	−.02	−.01	.00	.20**	.10
Reappraisal	1–7	.84	−.04	.13	−.04	.19*	.40**	.18*	.26**
Suppression	1–7	.77	.16*	.26**	.16*	.27**	−.05	.04	−.19**
Reactions to sadness									
Denial	1–7	.80	.21**	.13	.27**	.18*	.28**	.04	−.03
Disinterest	1–7	.50	.21**	.09	.04	.03	−.17*	−.17*	−.28**
Harmful	1–7	.67	.14	.16*	−.07	.04	.26*	−.03	−.04
Growth	1–7	.82	−.18*	−.01	−.08	.05	.14	.16*	.24**
Peer reports[a]									
Suppression	1–7	–	.13	.15	.23*	.22	−.08	−.04	−.14
Reappraisal	1–7	–	−.05	−.11	.11	.04	.03	.10	.08
Rumination	1–7	–	.02	.32**	−.09	.07	−.29*	−.29*	−.32**
Reflection	1–7	–	−.06	.07	.14	.04	−.17	−.08	−.03
Difficulty expressing emotions	1–7	–	.14	.28*	.07	.26*	−.01	.01	−.20
External thinking style	1–7	–	.31**	.22	.19	.32**	.00	.07	−.24*

Note. MST = Mental States Task. CONC = Concrete, LoDef = Low defensive level, IntDef = Intermediate defensive level, OBR = Objective-rational, HiDef = High defensive level, REF = Reflective, Total MST = total score on MST.
[a]n = 76.
$^{*}p < .05$. $^{**}p < .01$.

authenticity, empathy, and borderline traits in this study were similar to the ones obtained in Study 1). These results confirm the convergent validity indices across the two studies.

Emotional regulation. Table 5 also reports the correlations among mental states and additional constructs relative to emotional regulation, for Sample 4 ($n = 188$). Broadly, CONC, LoDef, and IntDef were generally associated with less adaptive emotional regulation functioning. OBR was positively associated with reappraisal, suppression, and denial of sadness. HiDef showed a fairly strong correlation with reappraisal and associations with reactions to sadness that represent both the initial openness of HiDef and its secondary defensive retraction; it was negatively associated with disinterest in sadness, but positively associated with denial of sadness and perceptions of sadness as being harmful. Finally, REF was generally related to adaptive emotional regulation functioning.

Peer Reports

The correlations among participants' mental states and peer ratings ($n = 76$) are shown in Table 5. CONC was positively associated with an externally thinking style as evaluated by peers. According to peers, LoDef was positively associated with rumination and difficulty describing emotions, while IntDef was positively related to suppression. OBR was positively correlated with difficulty describing emotions and an external thinking style, and positively correlated with suppression (marginal significance). Finally, HiDef and REF were negatively associated with rumination as evaluated by peers. Unexpectedly, reappraisal and self-reflection as evaluated by the peers were unrelated to participants' mental states.

General Discussion

The goal of the present research was to develop a practical measure assessing mental states as actualized in the here and now. Overall, the present results suggest that the MST possesses a strong factorial structure and adequate predictive validity with respect to a large range of related concepts. In line with the mental states model, the MST appears to well represent both "lower" and "higher" mental states according to the reflective continuum, which were found to be linked to a large range of negative/immature and positive/mature constructs, respectively. In addition, each mental state measured by the MST appears to have particular characteristics and to distinctively relate to some specific constructs.

Factor analyses of the MST indicated that six mental states can be both conceptually and empirically distinguished, namely, concrete thinking, low defensive level, intermediate defensive level, objective-rational, high defensive level, and reflective thinking, in both French and English versions of the task. Intercorrelations among these mental states also confirmed the hierarchical structure of these mental states, that is, opposed mental states were found to be negatively associated (e.g., concrete and reflective thinking), whereas mental states that share some characteristics were positively correlated (e.g., concrete thinking, intermediate defensive level, and objective-rational, which are all characterized by some distant attitude with respect to one's subjective experience). Moreover, these intercorrelations were of an acceptable moderate effect size, without being too highly correlated. Overall, these findings suggest that each mental state is sufficiently distinct from the other, and that each appears to tap into specific characteristics.

The total MST score derived from this six-factor model correlated positively and moderately with the score derived from the original MSRS content analysis method. This finding was important to confirm that the MST adequately assesses mental states as described by the mental states model. Although the MSRS observer-rated method has privileged access to some aspects more difficult to obtain with the MST self-report (e.g., clinical judgment), the results of the present research suggest that the MST has adequate power to assess mental states along the reflective continuum.

Portraits of Mental States

The present findings suggest that the MST is strong enough to capture with sufficient finesse the different characteristics and issues of each mental state. The portrait of each mental state is detailed below according to the findings obtained in the present research.

Concrete thinking. The lack of openness toward one's subjective experience and emotional dysregulation were highlighted by the negative associations between concrete thinking and mindfulness and authenticity, and by its positive correlation with an external thinking style as rated by peers. Concrete thinking was also negatively associated with positive and reflective emotions elicited after the MST and with lower levels of enjoyment of the task, thus underscoring the lack of interest and of reflectivity with respect to emotional contents. The negative association with empathy reveals a lower interest in others' emotional experience. There was no specific correlation with immature defenses, but a negative association was found with the use of more mature defenses, which is consistent with the claim that higher representational capacities are needed to use more mature defenses (e.g., Chan, 1997; Cramer, 2006). Finally, concrete thinking was unrelated to all psychological adjustment variables, which highlights a very interesting issue that concrete people may—despite their impoverished representational capacities—not present (or report) more psychological symptoms or lower positive adjustment, as compared with people with better representational capacities.

Low defensive level. Low defensive level was positively associated with trait-like negative emotionality, negative emotions elicited after the MST, and the perception of sadness as a harmful emotion. Some self-reflection capacity was present; it was, however, mostly motivated by perceived threats, leading to rumination, as rated by the participants and their peers. The consequent lack of openness and the presence of emotional dysregulation were highlighted by the negative associations with mindfulness and authenticity and by the positive correlations with difficulties identifying and describing emotions. Peers corroborated this latter finding.

Furthermore, as expected, this mental state was found to be associated with the use of immature defenses and with less adaptive strategies of regulation, such as suppression. It was also negatively associated with the use of more adaptive defenses, which is consistent with the higher mental elaboration capacities needed to use more mature defenses (e.g., Chan, 1997; Cramer, 2006). There was also a positive correlation with the intellectualization defense, presumably related to the difficulty talking about and describing exactly what one feels, as reflected in the intellectualization items. The above are usually characteristic of the borderline personality organization and our findings further supported the relationship between low defensive level mental state and borderline traits. Finally, this mental state was associated with impaired psychological adjustment, as indicated by its positive correlations with psychological and physical symptoms, and its negative correlations with life satisfaction and self-esteem.

Intermediate defensive level. The results partially corroborated the definition of this mental state. Emotional dysregulation was highlighted by the positive association with a preference for external thinking instead of a focus on one's subjective experience. The failure to acknowledge others' emotional experience was demonstrated by the negative association with empathy. Intermediate defensive level was not associated with major distortion defenses, but was positively related to denial of the emotion of sadness and to the use of suppression—this latter result being corroborated by peers. Finally, IntDef was unrelated to all psychological adjustment variables, except for a positive association with self-esteem.

These findings raise the important concern of underreporting. In fact, the use of denial and minimization strategies may prevent one from reporting personal difficulties and symptoms if the items of the questionnaires are too obvious or susceptible to social desirability. A main consequence of this bias seems to be that several correlational results with this mental state were nonsignificant. Along these concerns, it is unclear how to interpret the positive association with explicit self-esteem. Future research should clarify this issue by comparing, for instance, explicit

and implicit measures of self-esteem, to reduce denial and bias effects (for a distinction between secure and fragile high self-esteem, see Zeigler-Hill, 2006).

Objective-rational. The emotional distance from one's subjective experience was highlighted by the positive correlations with external thinking style (as rated by participants and their peers) and with difficulties describing emotions (as rated by peers), and by the negative associations with some authenticity subscales (Study 1) and empathy. It was also positively related to the use of intellectualization, denial of the emotion of sadness, and suppression as rated by the participants (marginally significant as rated by peers), all of which suggest an emotional distance and difficulty describing emotions. Although the pattern of correlations is similar to the one obtained for concrete thinking and intermediate defensive level states, the objective-rational stance was further characterized by more adaptive emotional regulation strategies, such as cognitive reappraisal, and more adaptive outcomes, such as fewer physical symptoms. Moreover, this mental state was associated with more positive and reflective emotions elicited after the MST, thus suggesting some positive involvement in an emotionally challenging task.

High defensive level. The presence of some reflective processes and openness to the true subjective experience was highlighted by the positive associations with interest in the emotion of sadness, reflective emotions elicited after the MST, enjoyment of the task, and authentic relationship connections (Study 1), and by the negative association with difficulty identifying emotions. Findings also provided some evidence of a second movement of retraction. Although the emotion of sadness was envisioned with interest, it was also considered potentially harmful and denied. Furthermore, the high defensive level state was positively related to mature defenses (e.g., self-observation, anticipation) and adaptive emotional regulation strategies such as reappraisal (e.g., positive reevaluation of the experience). This latter result is important, as the correlation was moderately high with reappraisal, thus underscoring the essential contribution of positive explicit reevaluation of the experience in this mental state. In sum, the subjective experience is first embraced with interest and openness and is re-evaluated and reinterpreted in a more positive and constructive light to cope with the experience. Finally, results support the fact that this mental state was associated with better psychological adjustment (reduced psychological symptoms and enhanced life satisfaction and self-esteem).

Reflective thinking. Full openness toward one's subjective experience was highlighted by the positive associations with mindfulness, authenticity, self-reflection, and interest in the emotion of sadness as well as perceiving sadness as an important emotion that has the potential for personal growth. Reflective thinking was also positively associated with reflective and positive emotions elicitation and with higher levels of enjoyment of the task, thus underscoring a great interest and reflectivity with respect to emotional contents. A higher interest in others' subjective experience was demonstrated by the positive association with empathy. Reflective thinking was also expected and found to be related to the use of mature defenses (because of the measure used in the present research) and to reappraisal strategies seeking to regulate difficult experiences.

Finally, consistent with past research (Bouchard et al., 2008), reflective thinking was unrelated to psychological adjustment. A possible explanation for this result rests on the distinction between satisfaction versus maturity, which have been suggested to be two independent processes (e.g., Noam, 1998) that are conducive to different forms of well-being (King, 2001). In the present research, psychological adjustment mostly focused on satisfaction outcomes (e.g., life satisfaction, self-esteem) rather than maturity. Maturity refers to a deeper self-understanding characterized by personal growth (King, 2001), which is more likely to relate to reflective thinking. In the present research, results on attitudes toward sadness provide preliminary evidence supporting this anticipated relationship. Indeed, reflective thinking was the only mental state associated with perceiving sadness as having a potential for personal growth. Therefore, examining the relationship between reflective thinking and maturity outcomes (e.g., personal growth, integration of the self, ego-development) appears to be a fruitful avenue for future research.

Overall, concrete thinking, low defensive level and intermediate defensive level as measured by the MST appear to well represent "lower" mental states according to the reflective continuum,

as they were found to be mostly linked to a large range of negative/immature constructs. Conversely, high defensive level and reflective thinking seem to correspond to "higher" mental states and were found to be mostly associated with positive/mature constructs. The objective-rational mental state appears to fall between these two broad categories, as it was found to be associated with both negative/immature and positive/mature constructs. The consequences of the objective-rational state presumably depend on the context; it may be associated with more negative/immature consequences in contexts requiring emotional investment or attention, but be adaptive in emotional contexts requiring intellectual abilities or quick problem solving. Future research should examine this issue within different types of context.

The present findings also support the usefulness of aggregating all the subscales of the MST into a measure of a mental states continuum along the line of their negative to positive contributions to the process of mentalization. Indeed, the *Total MST* score was positively related to openness and interest in subjective experiences (authenticity, mindfulness, empathy), positive and reflective emotions elicitation, the use of more mature defenses and adaptive emotional regulation strategies (reappraisal instead of suppression), perceptions of sadness as having a potential for growth, and less psychological symptoms and emotional dysregulation (alexithymia).

Adaptability of the MST

The MST can be adapted to diverse research questions, psychological issues, and populations. The items can be easily adapted depending on the image chosen. For example, if one seeks to study couple relationships, the card #4 of the TAT could be used (the image portrays a woman grabbing the shoulders of a man while the man is turning away from her, with another woman in the background). In this case, the MST items could be adapted to the perspective of one of the two characters or to both of them. Moreover, the MST can be adapted to other types of material toward which participants are asked to react, think, or write about. For instance, participants could be invited to read a vignette or to watch a film excerpt and then to write down their spontaneous reactions to the material or to describe personal memories. Only some items would have to be slightly adapted to fit a more personal material (e.g., "I thought that the situation I experienced [by the character] was difficult, but that things always settle down." The MST has the great advantage of being easily adaptable to various material and, consequently, to diverse research questions.

Limitations and Conclusions

The present research was limited in a number of ways. First, all measures were self-report. Although the MST was created with particular attention to bias concerns, this was not necessarily the case for the other questionnaires used in this research. As discussed above, the use of denial and minimization defenses in the intermediate defensive level stance could prevent one from reporting personal difficulties and symptoms if the items are too obvious or susceptible to social desirability. Likewise, self-closure from subjective experiences due to the emptiness characterizing concrete thinking may have precluded adequate evaluation of one's psychological adjustment and problems (e.g., evaluation of one's difficulties to identify emotions or of life satisfaction). Behavioral or indirect psychological adjustment and emotional regulation measures might be needed in future research to confirm the present findings (e.g., explicit versus implicit self-esteem or observers' ratings of the participants' reactions to a simulated situation of rejection or to negative feedback).

Second, only university students were recruited, which limits the generalization of the results. Future research should replicate the present findings with community dwelling and clinical populations. Finally, the present research focused on assessing mental states with an image related to loss/depressive states. Consequently, its usefulness with respect to other themes remains unknown (e.g., competence, couple interactions, sexuality). In its present form, the MST is not a global measure, but assesses mental states in the specific context of loss, which is an essential clinical theme. Future research may use different images with the MST to capture the portrait of the person's mental states with respect to other themes.

In sum, the present research proposes a practical task that evaluates differences in attitudes toward one's and others' subjective experience, in both French and English. Analyses suggested that six mental states can be theoretically and empirically distinguished. The present findings provide adequate evidence of validity and reliability for the MST as a task to evaluate mental states in the here and now. This innovative self-report measure is likely to contribute to future research in diverse domains and approaches, notably in facilitating the empirical investigation of mentalization and mental states. Future interesting avenues concern the clinical use of the MST, which could eventually be used with patients in psychotherapy and clinicians. These few stimulating avenues give an overview of the range of possible applications of the MST. It is our hope that the development of the MST will encourage future research on mental states.

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