The Algorithmically Structured Systematic Exploration of Subject’s State of Mind. I. Development of a New Interview

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ABSTRACT

Objective: To develop an interview method that combined the qualities of unstructured interviews, such as openness to unexpected information, and the qualities of structured interviews, such as adequate psychometric properties. Method: The innovative principle of the Algorithmically Structured Systematic Exploration of Subject’s State of Mind (Assess_Mind) is to investigate, not the contents of mental phenomenology, but five mental functions – or “registers” – that mediate the experience of patients. The functioning of these registers – affects, fears, desires, memories, and associations of ideas – is explored using a rigorously defined algorithm for interviewing. Scales have been developed to rate 390 interviews on psychopathological dimensions of interest in a study of patients undergoing in vitro fertilization (IVF) treatment. Results: As shown by vignettes from the various registers, the Assess_Mind provides detailed, comprehensive, and deep information on the five registers it investigates. Conclusion: Although the Assess_Mind uses a structured algorithm for data collection, its usefulness as a clinical research tool is based on the width and depth of its coverage of patients’ current mental experience. Copyright © 2007 John Wiley & Sons, Ltd.

Key words: interview, psychological, fertilization in vitro, emotions, motivation

INTRODUCTION

The aim of the present paper is to describe the development of the Algorithmically Structured Systematic Exploration of Subject’s State of Mind (Assess_Mind). In a subsequent paper, we shall report a study of the reliability and validity of
ratings obtained through this instrument in a specific psychosomatic study of infertile patients treated through *in vitro* fertilization (IVF). Because studies on the role of psychosocial factors in the etiology of infertility have yielded contradictory conclusions (Wright et al., 1989), we suspected that measures derived from questionnaires were not fully adequate to answer such a complex question. We thought that developing an instrument more open and able to pinpoint more fine-grained information might allow us to reach more stable conclusions.

The interview is one of the essential tools of research in psychopathology. Interviews vary considerably as regards the degree to which they are structured. For a variety of reasons detailed hereafter, researchers may prefer to use a highly structured interview; however, for other reasons, they may also be willing to use an unstructured interview. As shown in a series of landmark articles (Cox et al., 1981a; Hopkinson et al., 1981; Rutter and Cox, 1981; Rutter et al., 1981), a directive style is associated with obtaining better-quality factual information than that associated with a more free style approach. Conversely, emotional expression is facilitated by a low level of interviewer talk, with few interruptions, by a high rate of open (rather than closed) questions, by direct requests for feelings, by interpretations, and expressions of sympathy.

Thus, depending on the nature of the information that is being sought, different interview techniques will be adapted for use. Of course, it would be highly desirable to use an interview which combined the advantages of unstructured interviews with those of structured interviews and there have been attempts to integrate data from structured and unstructured interviews (Hendin and Siegel, 1981; Haas et al., 1987). In those attempts, data were collected from different kinds of interviews (structured and psychoanalytically oriented), and the data obtained through one approach were interpreted with information derived through the other approach. By contrast, the objective of the present study was to develop a new research interview that would combine the qualities of the two approaches and therefore meet the following criteria.

- In terms of what it investigates, the interview was to be as open as possible as to the nature and content of information it could collect.
- The interview should meet the usual criteria of scientific instruments, that is, reliability and validity.

The advantages of unstructured interviews as data collection instruments are manifold. They are potentially open to all types of information. The unstructured interview is also well-adapted to study mental representations. We refer here to a range of cognitions from abstract thoughts to the recall of concrete sensory experiences. One category of mental representations, memories, is particularly important clinically. The unstructured interview is obviously very appropriate to investigate memories, in particular autobiographical episodic memories, which help to understand a patient’s development, including the
Development of Assess_Mind

development of his or her psychopathology. Each unique individual is particularly well captured by unstructured interviews, and this is nowhere more apparent than in the area of autobiographical episodic memories.

Another hallmark of each unique patient may be the individual pattern of “connectivity” between their thoughts. The unstructured interview permits the investigator to determine the sequence of thoughts as they emerge in the discourse, which offers a window into this pattern of connectivity. The Psychoanalytic Research Interview (Cartwright, 2004) is an interesting recent example illustrating how an unstructured interview, used within a research context, relies on the associative nature of the interview material to understand intrapsychic processes.

In addition, the unstructured interview is highly flexible. It may be adapted to the level of understanding of the subjects and to the clinical picture. The interviewer's interventions may be adapted to previous utterances of subjects and to the emotional and cognitive aspects of discourse. If an important problem is suggested by the subject in a vague manner, the interviewer can focus the investigation on this point to clarify the matter. Psychoanalytically oriented clinicians can be alerted by a great variety of cues, including lexical choices and sequences of themes, to the presence of preconscious or unconscious thoughts and feelings, and can then explore these hints as they deem appropriate.

In terms of interview data reduction and analysis, it is possible for the researcher to exploit a potentially very rich database, to raise questions and hypotheses, and to draw clinical inferences and conclusions. The more clinically knowledgeable the researcher, the more use will be made of the information collected.

In contrast, many disadvantages of unstructured interviews are the “reverse side” of their advantages, as some advantages may become disadvantages if an unstructured interview is not conducted appropriately. According to Kvale (2003) “The quality of the knowledge produced in an interview depends on the craftsmanship of the researcher,” which rests on the technical mastery and the reasoned judgments of a qualified researcher, acquired through accumulated experiences of long periods of training. Thus, not all interviewers may actually use the potentially comprehensive coverage of unstructured interviews. The interactive nature of unstructured interviews generates the possibility of interviewer bias: interviewers may focus on topics that are particularly interesting to them and may avoid or neglect other topics. Interinterviewer reliability is poor, as interviewers’ interventions vary with their clinical skills, experience, affective reactions to patients, knowledge, and theoretical orientation (Saghir, 1971). Differences between interviewers have been clearly demonstrated by Cox et al. (1981a). Some of the interviewers these workers studied were “highly active and directive whereas others were the reverse. [. . .] the interviewers varied consistently with respect to the overall quality of the factual information they obtained.” As summarized by Young et al. (1987), poor reliability is related to many sources of variability, for example differences in topics discussed, variability in phrasing.
questions, changes of interview procedure by the same interviewer at different times, the interaction of differing interview styles and patient characteristics, the use of clinical judgment in unspecified ways, and informal methods for recording information.

In terms of data reduction and analysis it is very difficult to derive reliable and valid measures because of the highly variable nature of interventions used by various interviewers, and even by the same interviewer from one interview to the next. Finally, training has to be very thorough and prolonged, not only to conduct unstructured interviews adequately, but also to use optimally the information that is gathered.

The advantages and disadvantages of structured interviews are largely the opposite of those of unstructured interviews. In research contexts, structured schedules are now used most often for a variety of reasons. Standardized and systematic questioning is associated with better-quality factual data (Cox et al., 1981b). Questions and probes are carefully selected as to their content and tested as to their wording. This standardization minimizes interviewer variance. Standardized schedules were actually developed to enable various clinicians to diagnose mental disorders reliably (Wing et al., 1967; Saghir, 1971; Spitzer and Endicott, 1978; Young et al., 1987).

At the data analysis step, it is much easier to code information and to achieve intercoder reliability. Reliability and validity are relatively easy to evaluate. Finally, structured interviews require definite, but limited and specific, skills at both the administration and the data analysis steps. Training to administer and to analyze data is therefore much shorter than for unstructured interviews. If we admit that both the unstructured and the structured interviews present advantages and disadvantages, is it possible to combine in a new type of interview the advantages of both instruments, without incorporating their disadvantages? At least one instrument combines both these kinds of qualities, the Adult Attachment Interview (AAI) (Main et al., 1985). The AAI is specifically focused on the representational aspects of attachment relationships in adults. In summary, the interviewer uses a series of standardized open questions as probes to investigate past attachment relationships. The subject’s discourse is transcribed verbatim and evaluated on a series of rating scales. Based on these ratings, the transcript is considered as reflecting one of several categories of attachment relationships. Research has shown that intercoder reliability on assigning categories of attachment to transcripts was satisfactory (Fonagy et al., 1991). As regards predictive validity, it has been repeatedly demonstrated that the specific patterns of attachment shown by adults predict significantly that the same pattern will also be shown by their infants in their attachment to these same adults as parents (e.g. Fonagy et al., 1991). From the technical point of view, the AAI has been a model in developing the Assess_Mind. However, the purpose and the content of the Assess_Mind are very different from those of the AAI.
THEORETICAL MODEL UNDERLYING THE ASSESS_MIND

The primary purpose of the Assess_Mind is to provide researchers with a very detailed image – a “cartography” – of the current mental experience of a subject. Our aim is thus related to the phenomenological approach (Chessick, 2002; Giorgi and Giorgi, 2003). As formulated by Chessick (2002), “Phenomenology as we [Chessick] use it here attempts to capture in all its concrete immediacy the intrinsic nature of one’s experience, exactly as it occurs to a person and without any embellishment, explanation, extrapolation, interpretation, inference, or attribution to any theory; for example, what it feels like to experience dizziness, grief, hunger, or pain.” In addition, under the term “phenomenology,” we include not only the current conscious experience of the subject but also the range of representations and emotions that are accessible to awareness upon questioning by the interviewer. Therefore, questions are intended to investigate a series of modalities or areas of mentation, that we call “registers” of mentation.

The concept of registers of mentation is derived from the fact that two very broad modalities of the phenomenology of mental activity may be distinguished: the first is cognitive and the second is affective. However, in response to the perception of specific items of the environment, cognitive and affective modalities are generally combined. Mischel and Shoda (1995) call these combinations “cognitive-affective units.” Thus, specific cognitions, such as the plan to perform a specific action, have various types of correlates: affective correlates, and/or motivational correlates, and/or mnemonic correlates, and/or ideational correlates. As they are associated with specific cognitions, each of these categories of correlates may be considered as fulfilling a distinctive and fundamental function in relation with cognition. We refer metaphorically to these functions with the term “registers,” as if the various types of correlates of cognitions were “written” on as many mental registers. In practice, as is detailed hereunder, the specificity of the Assess_Mind interview format is to focus on the investigation of each of these mental registers. More precisely, five registers are sequentially investigated during the interview: affects in general; fears; desires; memories; and free associations of ideas.

Here is an illustration of the distinction between contents of mentation and registers of mentation. Any utterance occurring in an interview, irrespective of the interview format, may be characterized within a two-dimensional system: (i) the utterance has a content; (ii) it is associated with one (or more) register(s) of mentation. For instance, if a subject says “Last year, the doctor diagnosed I had bilateral tubal occlusion,” the content is a specific event in the history of the patient’s infertility while the register of mentation is a specific form of mental representation, that is, the recall of an episodic memory.

In terms of interviewing techniques, the first utterance could conceivably be collected in response to either of two questions: (i) “Do you know the cause of
your infertility?" (content-oriented question); or (ii) “Which memories are currently coming back to your mind?” (register-oriented question). The principle of the present interview method is to explore mental phenomenology not by questioning subjects about specific contents, such as their symptoms, their marital relationships, and so on, but instead to question them about registers of their mental life. Hereunder, we provide the rationale for the selection of the five registers explored in the Assess_Mind.

In the development of the Assess_Mind, we distinguished feelings and desires. This distinction rests on the following basis. If we see the mind as a system which first receives information from the outer environment and from the body, then processes such information, and finally responds to it, then feelings – as the etymology of this word indicates – are closely related to the reception of information. Feelings assign an emotional valence to information. By contrast, desires, that is, the third register, may be seen as closely related to the output of the system, as they imply that the subject perform an action or that some change occur in the environment or in the body. Again, Psychoanalysis was an important theoretical basis in emphasizing this distinction between feelings and desires, because of the central role it assigns to desires in the causation of psychopathology when conflicting desires become unmanageable.

“Fears,” that is, the second register, is actually a subset of the register of “Affects.” However, based on the major role assigned by psychoanalysis to anxiety in the etiology of psychopathology, the register of “Fears” was singled out to ensure that fears would be explored, even if subjects did not mention any fear during the exploration of affects.

The cognitive aspect of “cognitive-affective units” clearly comprises various submodalities, for example perception, formal thinking, memory, and so forth. Based on psychoanalytic theory, we hypothesized that two most fruitful probes of cognitive activity would be asking subjects to recall episodic memories and to produce free associations. In psychoanalytic theory, it is the unconscious and repressed memories which are considered as factors in the etiology of psychopathology. However, we hypothesized that accessing preconscious episodic memories in response to a specific probe would yield important indices of subjects’ current state of mind. Free associations are mental representations linking up with one another after subjects have been asked to suspend efforts to impose logical and moral constraints on the flow of their thoughts. In psychoanalysis, free associations yield the verbal material that can eventually lead to the understanding of unconscious representations, affects, and motives. Although a face-to-face interview is less appropriate to the production of free associations than is the classical analytical situation, we hypothesized that asking subjects, through a specific probe, to suspend (as much as possible) logical and moral constraints on the flow of their thoughts would elicit the expression of important aspects of their current state of mind. In addition, we thought that placing this probe in the final part of the interview, that is, after subjects had been helped to get in contact with their affects, fears, desires, and memories, would facilitate the
expression of deep aspects of their preconscious functioning. Finally, we have found it useful to designate under a generic term, “mentations,” the various kinds of mental productions – affects, fears, desires, memories, associations of ideas – elicited in investigating the different registers. Although the five domains are explored separately, we do not consider these registers as functioning independently: (i) from a practical point of view, probes to explore a particular register sometimes elicit the expression of mentations belonging to another register, for example the probe on desires may elicit the recall of an episodic memory; (ii) some mentations combine two or more registers, for example subjects may express affects about a memory (e.g. “This is a sad memory”).

The Assess_Mind does not investigate with a specific probe the domain of abstract reasoning, that is, the most logical aspects of thinking. In constructing the Assess_Mind, we hypothesized that the most difficult aspects to explore would not be the logical aspects of mentation, but its “deepest” aspects, that is, the experiences that subjects tend to conceal or omit because they are considered as socially undesirable and/or because they are associated with intensely painful emotions.

An advantage of the register-oriented questions is that they are limited in number (just as the registers themselves). By contrast, the diversity of the contents of mental phenomenology is quasi unlimited, so that the researcher designing a new interview schedule oriented toward contents is forced to make a partly arbitrary selection among these contents before inclusion into the schedule. Within the context of exploratory studies, a related advantage of using register-oriented questions is that subjects are free to specify the contents that seem important to them. Hence, in the subsequent analysis of the interview, researchers are able, not only to identify the contents expressed by subjects but also to note those that are conspicuously absent, for example the lack of reference to the partner in an interview before IVF treatment. This approach also contrasts with an approach based on the search for symptoms, in that all the registers cited above exist both in healthy and pathological functioning. However, healthy or pathological status will be reflected in the quality of affects, desires, memories, and ideas expressed by subjects.

METHOD
Clinical Setting and Patients

The Assess_Mind was developed in the course of a research on the psychological factors potentially affecting the outcome of IVF (Stoléru et al., 1997). Subjects were interviewed in the gynecology clinic on the day before oocyte retrieval (OR) and, if embryos were subsequently obtained in vitro, they were interviewed again four or five days later a few hours before embryo transfer (ET). The participants were 139 women and 101 of their spouses. As some patients were interviewed twice (before OR and ET) a total of 390 interviews were conducted.
For female patients, the means (standard deviations, [SDs]) for age, years of education, and years of infertility were 32.7 (3.1), 15.1 (3.7), and 6.2 (3.8) years, respectively. The corresponding figures for men were 35.0 (4.5), 15.5 (3.8), and 5.2 (3.3) years, respectively.

Selection of Registers and Construction of Algorithm

The five registers were selected on the basis of the theoretical model presented above. In addition, we studied systematically nondirective interviews recorded in a previous study (Stoléru et al., 1993) to determine whether the five selected registers adequately covered the phenomenology reported by subjects in a similar situation. Finally, a psychological and psychopathological literature search was performed, again to determine which registers of mental functioning might have been omitted from our initial choice of five registers.

The algorithm was developed in the pilot phase of the study. This phase included 110 interviews (among the 390 interviews). Difficulties encountered by interviewers were systematically discussed with them, which led to improvements in the Manual for Administering the Assess_Mind (Stoléru and Le Mer, unpublished).

Structure and Administration of the Interview

The Assess_Mind comprises two modules: a data collection instrument and a set of rating scales. A full description of the administration and rating procedures has been written in two manuals, one for each module of the instrument (Stoléru and Le Mer, unpublished). We shall first describe the various kinds of interventions by the interviewer. Then we shall detail the algorithm defining when and why these various kinds of interventions are to be used. Four kinds of interventions are used: (i) Introduction of the interview; (ii) Initial probes (IPs) introducing each register; (iii) Requests for specification; and (iv) Follow-up probes.

The introduction of the interview runs as follows: “The interview I am proposing to you will bear upon several aspects of your current experience. We shall focus sequentially on several domains and, for each of them, I shall ask you to express what you are currently experiencing. Please try to answer by telling me what comes to your mind, even if your answers may seem embarrassing or irrational to you.”

The first IP is: “The first domain which I would like you to talk about is the domain of your feelings; I would like to ask you to tell me which feelings, which emotions you are currently experiencing.” The probes for the other registers are: “I shall now shift to the domain of fears and apprehensions. I would like to ask you which fears or apprehensions you are currently experiencing.” Third register: “I shall now shift to the area of desires. I would like to ask you to tell me which desires you are currently feeling.” The investigation of the fourth register is directed to episodic memories in general and to childhood episodic memories.
in particular. Therefore, the probe for the fourth register is: “I would now like to shift to the domain of memories. Which memories are coming back to your mind at this moment? You may evoke recent memories as well as childhood memories.” Finally, the probe for the fifth register is: “I would now like to shift to another domain which is the associations of ideas. For this domain even more than for the others, I am going to ask you to tell which ideas come to your mind, without excluding ideas, even if they seem irrational or embarrassing. While you are letting ideas come to your mind and link up with one another, and as you are letting your mind wander freely, which are the first ideas coming to your mind?”

Importantly, the IPs are not expressed in the form of questions that subjects may answer by “Yes” or “No.” This feature of the probes is consistent with the finding that the percentage of open questions is positively correlated with the number of feelings expressed by informants (Hopkinson et al., 1981). The probes do not include the terms “before oocyte retrieval [or embryo transfer],” because they would orient subjects to particular events. Actually, even in the hours preceding IVF subjects may well experience feelings related to quite different domains of their life.

Sometimes, in response to the IPs, subjects not only express mentations corresponding to the register being explored, but also specify these mentations spontaneously. For instance, in the third register, a subject may say that she or he wishes for the success of the IVF trial and then explain that she or he wishes that the baby will have hair of such color, such future, and so on. More often, however, subjects limit themselves to briefly identify desires (or affects or fears, etc.) in general terms. In such cases, the interviewer has to formulate a request for specification.

To illustrate the purpose of requests for specification, it is useful to compare each mentation expressed in response to an IP with a closed box on which a more or less explicit label would be written. For instance, if a subject says, in response to the IP on Fears, “I am afraid that the pregnancy does not go till its end,” this statement can be considered as a closed box bearing the label “Fear of premature termination of pregnancy.” Then it is the interviewer’s task to open this box to investigate its contents. In this case, the appropriate request for specification would be: How does this fear of premature termination of pregnancy present itself in your mind?”

The notion of explicit versus nonexplicit mentations is critical to the Assess_Mind. We consider that a mentation has been made explicit if the interviewer judges that she or he can form a clear, detailed, and specific homologous mentation in her/his own mind. Thus, if a subject says “I feel anxious,” this affect is not expressed in a detailed manner. The interviewer will then formulate a request for specification: “How does this feeling of anxiety present itself in your mind?” The patient may then explain that she is afraid to undergo a general anesthesia because she is not sure that she will awake from it. Similarly, in the register of Memories, increasingly explicit memories are: (i) memories of “family
reunions;” (ii) memories of family reunions at Christmas;” (iii) memories of the “family reunion at Christmas 1987 when uncle John brought a wonderful tennis racket to David, our child. We felt very grateful to him.” Only the last memory can be considered episodic and explicit.

Follow-up probes are used to bring subjects to express five mentations in each of the registers, if she or he has not done so spontaneously in response to the IPs and if time constraints allow it (see Algorithm hereafter). The number of five mentations has been chosen empirically, as it fits well with the 75-minute length of the Assess_Mind. For the first three registers, the wording of follow-up probes is: “Please, try again to tell me which feelings or emotions [or “fears and apprehensions,” or “desires”] you are currently experiencing.” For the fourth register, the follow-up probe is: “Please try again to tell me which memories are currently coming back to your mind” or, if the subject has already expressed a childhood memory, “Please try again to tell me which childhood memories are currently coming back to your mind.” For the fifth register, the follow-up probe is: “Please, try again to tell me which is the first idea that comes up to your mind at this time.” Importantly, like requests for specification and IPs, follow-up probes are not expressed as questions which may be answered by “Yes” or “No.”

As a rule, an interviewer’s intervention should not be expressed before a 10–20-second interval has elapsed since the subject has stopped talking. This rule has been included upon the empirical finding, in the pilot phase of the development of the instrument, that subjects spontaneously went on to specify mentations if interviewers gave them time to do so. The upper limit of 20 seconds has been introduced to prevent feelings of embarrassment or anxiety that often arise in subjects and/or interviewers during prolonged periods of silence. The time for the exploration of each register (15 minutes) has been found to strike an optimal balance between the need to explore registers as completely as possible and the need to avoid fatigue in subjects.

The structure of the Assess_Mind as a data collection instrument can be schematized as the algorithm illustrated in Figure 1.

After introducing the interview, the interviewer formulates the IP of the Register of Affects. We shall first consider the usual case when subjects express one to four affects in response to this IP. Affects expressed are briefly noted on a special form, the Summary of the Assess_Mind Interview. After a 10–20-second pause by the subject, the interviewer formulates a request for specification for the first mentation she or he judges as not fully explicit. The subject will then detail this mentation. However, the same mentation may need further requests for specification to help the subject get to the level of the specific mental image and/or feeling. After the first nonexplicit mentation has been specified, the interviewer formulates a request for specification for the second nonexplicit mentation, and the process continues until either (i) the time limit is reached for the first register (15 min) or (ii) all nonexplicit mentations have been specified. In the first case, the interviewer shifts to the next register. In the second case, as less than five mentations have been expressed in response to the IP, the

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Figure 1. Algorithm of the Assess_Mind. For the register of Association of ideas the only criterion for termination is 15 minutes of exploration. IP = initial probe.

The interviewer formulates a follow-up probe after a 10–20-second period of silence. In response to this follow-up probe, in some cases subjects express additional mentations that may require requests for specification. Then this process continues until five mentations have been made explicit or the time limit has been reached. In other cases, subjects say that they have no more affects to express. Then the interviewer shifts to the register of Fears.

In the first case considered, the subject had expressed one to four affects in response to the IP. In the second possible case, the subject would not express any affect. This case has been theoretical until now as it has never happened.
In such a case, the interviewer would make sure that the IP has been understood and formulate a follow-up probe. If no feeling would be expressed, the interviewer would shift to the next register. By contrast, in response to the IP on Affects, fairly frequently subjects express five or more affects. Then the procedure is the same as when the subject expresses one to four mentations, except that no follow-up probe is necessary.

The same procedure is followed for the second and third registers. It is also followed for the fourth register, except that the probe on childhood memories is formulated either after about 7 minutes 30 seconds have elapsed or after three memories from adulthood have been specified, whichever criterion is first met. In the fifth register, the interviewer will not note more than five ideas expressed by subjects because they are usually too numerous. After 10–20-second pauses, she or he will invite subjects to associate to the previously expressed idea (“Which is the first idea that comes to your mind in association with the idea of [previous idea mentioned by the subject]?”). If the subject cannot associate, or if the flow of associations becomes circular (idea 1 → idea 2 → idea 3 → idea 1 → idea 2, etc.), the interviewer formulates the follow-up probe of the register of Associations (see above). All ideas are treated in the same manner, whatever their apparent importance.

Sometimes, subjects experience emotions that are so painful or intimate that the interviewer is not sure she or he should proceed. The interviewer should then acknowledge this difficulty by asking the subject whether she or he agrees to continue exploring the current register. Generally, subjects will agree. If they do not, the interviewer should shift to the next register.

**RATING SCALES**

All interviews are recorded on audiotape and transcribed verbatim. The rater may, or may not, be the interviewer. In order to assess interrater reliability all interviews were rated by two researchers. In addition, to assess the potential effect upon ratings of having been the interviewer, some of the interviews were conducted by either one of the raters. Twelve rating scales were specifically developed for this study to measure psychological constructs hypothesized to be relevant to the outcome of IVF. The selection of the content scales was based on a literature search on the psychological aspects of infertility and on our previous work (Stolér and Le Mer, 1993; Stolér and Le Mer, 1997). The purpose of scales is to obtain a quantitative evaluation of the transcripts on a series of psychological dimensions. For each scale, possible ratings range from one (zero or extremely low degree) to nine (extremely high degree). Criteria for the various ratings have been defined in a manual (Stolér and Le Mer, unpublished). Each scale is applied to the entire transcript. Psychometric properties of scales are reported in a companion paper. (Le Mer and Stolér, 2007)

Scale 1 is intended to measure the intensity of the wish to have a child. Scale 2, negative affects associated with the project to conceive a child, was developed.
on the grounds of infertile patients’ ambivalence to prospective parenthood (Cabau and De Sernarclens, 1986). Scale 3, negative affects associated with the IVF procedure, was developed upon the suggestion (Wright et al., 1989) that intense negative emotions induced by infertility diagnostic and therapeutic procedures could by themselves lower chances of success of IVF trials. Similarly, scale 4, negative affects associated with infertility, was developed upon the suggestion (Wright et al., 1989) that intense depressive or anxious responses to infertility could generate a vicious cycle contributing to infertility. Scale 5 assesses negative affects associated with problems not directly related to the current IVF trial. Scale 6 evaluates positive affects associated with the project to have a child. Scale 7, vulnerability to psychosomatic disorganization, is based on recording past and current episodes of psychosomatic disorders. Episodes of psychosomatic disorders have received operational definitions in the rating manual (Stoléru and Le Mer, unpublished) based on current conceptions of somatization disorder (American Psychiatric Association, 1994). Scale 8, expression of emotions, is intended to measure to which degree subjects experience emotions in response to external events or to their own mental activity. This scale has been developed on the basis of theories of psychosomatic disorders developed by Sifneos et al. (1977) and by Marty (1976). According to Marty’s theory, psychosomatic patients tend to have a poor capacity to generate affectively laden conscious mental representations and to limit themselves to the more logical kind of operational thinking, a disturbance that has been called “pensée opératoire.” Scales 9 and 10 relate to episodic memories associated with the project to conceive a child. These two scales, positive episodic memories (scale 9) and negative episodic memories (scale 10) are based on the theoretical premise that the nature of episodic memories – considered both for their figurative or representational aspects and for the associated recalled affects – are indices of the present state of mind (Blaney, 1986; Rolls, 1999). To increase the magnitude of the hypothesized relation between episodic memories and the outcome of IVF, only episodic memories bearing on the following referents were rated: (i) parenthood; (ii) subjects’ marital dyad; and (iii) previous IVF trials. Scale 11, husband’s support and concern for wife, applies only to male patients’ transcripts. Scale 12, representational activity related to IVF, was developed to assess subjects’ capacity to generate mental representations of IVF-related referents. This scale was developed on the basis of Marty’s “pensée opératoire” theory.

The rating system comprises two levels of ratings, that is, an elementary and a final rating. First, that is, at the elementary level, each mentation relevant to a particular scale is coded on a three-point scale: low, moderate, and high. In the second step, the rating on the final level takes into account both the intensity and the recurrence of elementary ratings. “Recurrence” refers to the number of registers where relevant mentations have been rated at the elementary level. For all rating scales, criteria for elementary and final ratings have been detailed in the rating manual.
RESULTS

First, using the transcript of the interview of a female patient (No. 193), we present examples of the clinical information provided by the Assess_Mind interview and of the actual operation of the algorithm. As illustrations, we present the verbatim transcript of the answer of this patient to the IPs of the registers of affects and of memories. For reasons of limited space, it is only for the first register that we present excerpts of the patient’s answers to requests for specification and to follow-up probes. One- to two-second periods of silence are indicated by suspension points. Interviewer’s words are italicized and placed between parentheses. Sometimes, we have inserted words between brackets to facilitate the understanding of elliptic oral discourse.

Response to the IP on Affects

{{3 sec of silence}} Uh! . . . a feeling . . . I don’t know, I am perhaps both . . . no . . . I am hopeful! And . . . but there is also the possibility of failure! As it is not a hundred percent sure uh yes . . . I feel that failure is . . . very present! . . . Even though I try not to think too much about it! We are not lucky enough to be able to have a child . . . easily! But if medicine offers to us the possibility to have one . . . I think we must consider it as a chance . . . [as] one of the advances of medicine and . . . I find it wonderful!

The interviewer noted two feelings, that is, hope, and an unspecified feeling associated with potential failure. When first mentioned, hope was not specified, then hope was related to “wonderful advances in medicine.” For each feeling, the interviewer expressed a request for specification. We present the answer to the request for specification of the second feeling:

Well, each time I think about success . . . what I am the most afraid of, what scares me most is not oocyte retrieval, it is not [embryo] transfer, if [such a] transfer happens . . . medical intervention is not important . . . Well I am not afraid, I am totally confident in the doctor, so I am not afraid at all! It is waiting afterwards [after embryo transfer that scares me] and to experience the failure if there must be a failure.

Then the patient explained how failure of IVF trial would demonstrate her own inadequacy, as opposed to previous failures of trials of artificial insemination by donor, which did not point solely to her as the infertile spouse:

Before, we were doing inseminations . . . it was less terrible! I was injected with sperm and then nature was allowed to act and then . . . well, it didn’t work . . . I said to myself “Well, it didn’t work!” I felt it was less hard and . . . less of a constraint . . . well, it was annoying but . . . as the process of inseminations was unfolding, I was sure that we would get to in vitro fertilization, I was saying to myself that it would not work otherwise! . . . So, I really feel that IVF will succeed . . . I don’t know if it will be on the first time or the second time but I believe that it will work . . . Because in fact I will be given something already . . . quote . . . “made”! . . . I will be given an embryo . . . or two . . . They will be reimplanted into me and . . . quote, “the work will be done!” . . . and I think that this is
Development of Assess_Mind

going to work. . . . But if it were not to work I would feel failure due to myself! . . . and not due to our couple in fact. . . . I would say to myself “It is me who has not succeeded in . . .” and I do not know how I am going to experience this! This is what makes me the most anxious!

After the two feelings had been specified, nine minutes had elapsed since the beginning of the interview, which left time to formulate a follow-up probe on affects. This probe allowed the patient to express (i) her anxiety about general anesthesia, whereas she had previously denied anxiety related to the medical intervention (see above) and (ii) feeling rather well, apart from the aforementioned anxieties. The latter statement is important because it modulates the intensity of negative affect expressed by this patient.

Response to the IP on Memories

Memories from adulthood: “Puff . . . memories!? Well, I don’t know . . . I liked very much the day of our wedding . . . it was nice! We organized a celebration, it was fine! Uh . . . [I remember] The moment when both of us met! . . . Less pleasant, [I remember] the moment when our problem was discovered! Yes, then I said to myself “It will be very, very hard!” Also less pleasant . . . the fact that . . . in the beginning it was not easy because . . . he was alone with his sister and . . . well . . . the two of us [the patient and the sister] were a little bit . . . rivals! . . . Well, we were to get married . . . we postponed the wedding because my husband’s grandmother died. . . . It was not easy because she had been the only person very close to him who was still alive! Because actually as he lost his mother . . . [as] his parents were divorced and [as] we hardly saw his father, the only person really very, very close to him was his grandmother. . . . Which memories [are coming to my mind]? . . . I can tell others [memories] that come to my mind . . . my second insemination was a bad experience . . . and I don’t know why! . . . But I had a fit of tears and Doctor X . . . he did not know what to do because . . . actually he did not hurt me . . . it was . . . I don’t know [why] on the first insemination I was . . . I experienced the first insemination as a first encounter! . . . As . . . uh . . . something . . . uh . . . nice . . . [whereas] on the second [insemination] I said to myself “This will fail” . . . so, actually this second insemination was really a very bad experience! The third [was a] . . . very good [experience] . . . because I was treated . . . so, I said to myself “This may succeed!” and actually [I did] the fourth . . . maybe to . . . get rid of inseminations and to do the IVF! . . . I truly believe in IVF!

The interviewer noted nine memories: the day of the wedding; the first time when the patient and her husband met; the episode when infertility was discovered; the rivalry between her and her husband’s sister; the death of her husband’s grandmother; the four trials of artificial insemination. Because the exploration of memories from adulthood is limited to seven to eight minutes, the interviewer could express requests for specification for the three first memories. Each of these memories turned out to be very revealing about the patient’s mental representations of her husband. For instance, to specify the first memory, she mentioned that her husband, when about to put the wedding ring on his wife’s hand, “took the wrong hand! And then he could not put the ring on me.”
Response to the Probe on Childhood Memories

Memories from childhood!? {{4 sec of silence}} Oh! I had a spoilt childhood {{3 sec of silence}} uh... normally spoilt... I have no specific memories... uff... I did not like adolescence, I don’t know why! – But... before?... uh... my grandmother’s death... [my grandmother] who lived with us... but before that uh... puff! No... it’s true I do not have a memory... a thing that comes like that {{11 sec of silence}} (You mentioned the memory of your grandmother’s death. Please, try to tell me in detail an episode of your grandmother’s death and to tell me which feelings you experienced during this episode). My grandmother died in a clinic and she was repatriated to our home... the ambulance people brought the body... upstairs... and I did not want to see, it... this actually... uh... I went and hid into a wardrobe! My father found me... and told me... “But what are you doing in here?” Well, I said... uh... “I am waiting till it’s over!” And that’s it! The feeling?... I don’t know I didn’t want to see... and I wanted that nobody see me... and {{3 sec of silence}} I don’t know why I did that! {{5 sec of silence}} but I remember it very well.... I was {{6 sec of silence}} let’s say I was... yes I was 11! {{3 sec of silence}}.

Interestingly, this childhood memory referred to the death of a close relative. Such memories often emerged in these patients who were trying to conceive and give life to a new human being.

Results of the Application of Rating Scales

To demonstrate the results of the application of scales, for each scale we provide excerpts drawn from various interviews with their corresponding elementary-level ratings.

Scale 1. Wish to have a child
Here is an excerpt rated “High intensity:”

I want to have a child, I want to be a mother, I want to give lots of things to the baby, I want that my baby brings me lots of things. I feel like mothering my child, to be like all mothers crazy about... in love with my child.

Scale 2. Negative affects associated with the project to conceive a child
Here is an excerpt rated “Moderate intensity,” expressed by a patient after a request to specify her wish to be a good mother:

[If hope] I shall be able to see when he is ill... uh... [able] to try to prevent what is going to happen! Uh... and then much later, well, [able] to try and manage so that he will not be a drug-addicted child or a child who takes the wrong way, I mean a child who becomes a gangster! But I have time to worry about this! But, for early childhood, I think that... I hope that... uh! Well, I hear a lot of talk about [sudden] infant’s death... Well! I do not wish this [happens] to me, I do not wish this for anybody... but even less for me.
Scale 3. Negative affects associated with the IVF procedure
“High intensity:"

At present, I feel scared! I am scared by oocyte retrieval! I am very... I feel anxious... a little disoriented to be here [patients spent the night preceding OR in the clinic], tired, well, I don’t know, at present my feelings sum up to this [fear]! I do not see anything else! I feel anxious! It is a great anxiety, very little hope, it is primarily anxiety about tomorrow morning!

Scale 4. Negative affects associated with infertility
This excerpt was rated “Moderate intensity:"

We keep this [infertility] for us in our couple, we talk a lot about it within our couple but we find it difficult to... to avow this outside [our couple], I mean it is a sort of fault actually!

Scale 5. Negative affects associated with problems not directly related to the current IVF trial
“Low intensity:"

We had been living for seven years in the countryside! It’s been five months since we have moved to the building in the city... and we have a hard time to cope with this change!

Scale 6. Positive affects associated with the project to have a child
“Moderate intensity:"

Well, sure, I had rather do this as everybody else... naturally and... to do it in a more romantic manner but... well! At the same time it is hope [that we feel] when one cannot do otherwise!

Scale 7. Vulnerability to psychosomatic disorganization
The following excerpt illustrates a patient’s health problem, that is, extrauterine gestation, following a stressful life event:

There was the death [of the patient’s father], those are times that are not always easy to experience! But which we [her mother and her] experienced well, actually we overcame it, my mother did not have a depression... neither did I! The only problem is that she was about to lose me two months later... when I had an extrauterine pregnancy, so it was hard!... To lose a dear person is hard, [to lose] two seemed to belong to the realm of irrationality!

Scale 8. Expression of emotions
The following excerpt was rated “High Intensity:"

I am afraid of death, of my own death, because I do not know what is awaiting me behind [death] and this unknown makes me anxious! Any sort of unknown makes me anxious.
Scales 9 and 10. Episodic memories associated with the project to conceive a child

“High intensity” on positive episodic memories:

My parents have given enormously to me and I would dearly like to give, with my husband, to the child we will have this same, . . . give again what I have received.

“Moderate intensity” on negative episodic memories:

I am always thinking of the problems I have with young children, I have never known how to behave with a child. I always see the scene – I was in high school – at a friend’s home when a child was staring at me, and I felt as if I was blocked.

Scale 11. Husband’s support and concern for wife

“High intensity”:

I support her morally, I help her, but all the difficult part of the preparation, she is the one who does it, a difficult and painful part. In a couple, when one is in a difficult position, well the other one tries to be there to lift the [other] spouse out of the water.

Scale 12. Representational activity related to IVF

An example rated “High Intensity” was:

I am waiting for an important step! The step of oocyte retrieval . . . the step when there will be this mixing . . . uh . . . of our two essences . . . and maybe there are some [oocytes] which they [sperm cells] will leave aside and they [gametes] will say to each other “No, we do not feel like mixing together.” I don’t know what is going to happen in this tube.

DISCUSSION

We have tried to show that the Assess_Mind provides the clinical researcher with rich and detailed information on affective, motivational, and cognitive aspects of patients’ states of mind. Such richness and detail reflect the depth, the specificity, and the range of clinical data accessed through this instrument. This result was all the more difficult to achieve with patients studied here, who agreed to participate in this study only for research purposes, that is, with no therapeutic benefits, and who might have been tempted to minimize problems.

Where is the Assess_Mind located on a continuum ranging from unstructured to structured interviews? The Assess_Mind is highly structured as regards the algorithm that is followed and the wording of interviewers’ interventions based on this algorithm (see Figure 1). As a result, the interviewer feels guided and supported by the solid “handrail” represented by the algorithm. When administering the interviews, interviewers have been repeatedly struck by an important difference between the Assess_Mind and the unstructured clinical interview: the Assess_Mind requires from subjects actual mental work in the
sense that requests for specification lead subjects to specify mentations that would otherwise remain more general, and follow-up probes lead them to widen the scope of mentations they have initially expressed. One of the aims of the algorithm is to lead subjects to specify mentations in a very detailed manner. In the description of requests for specifications, we have illustrated the process of specification with an example from the register of memories: level 1, memories of “family reunions;” level 2, memories of “family reunions at Christmas;” level 3, “the family reunion at Christmas 1987 when uncle John brought a wonderful tennis racket to David, our child.” One may wonder whether there is a clear limit to this process of specification. For example, should the interviewer further ask how old David was, or who were the other participants in this family reunion? Clinically, these questions would clearly be irrelevant to the main meaning of this memory, which consists in a happy episode illustrating the ties between some of these family members. By contrast, the reason of the request for specification of the level 2 memory is that there had been several family reunions at Christmas; thus, level 2 does not refer to an episode, but is an abstraction based on several episodes. As such, it does not have much clinical meaning. Thus, as a rule, interviewers have been able to determine when a mentation has been made fully explicit, that is, when to stop the process of specification.

When judging from the five IPs, at first one may think that subjects need considerable insight to answer them appropriately. For instance, to tell the interviewer which emotions they are feeling, subjects have to be able to feel emotion(s) and to label these emotion(s) verbally. However, our experience over several hundreds of interviews has shown us that in almost all cases subjects have been able to focus on their emotional experience and to assign it a meaningful verbal label. Similarly, almost all patients have been able to answer the other IPs.

The Assess_Mind is not intended to yield a comprehensive biographical account of patients. The memories that emerge in response to the fourth probe represent a limited part of the patient’s history. The process of selection among the myriads of potentially recalled memories is largely nonconscious and has been shown to depend on the characteristics of the subjects’ current situation (Blaney, 1986). For instance, IVF patients will often recall episodes of being nurtured as children while they are engaged in becoming nurturers themselves. In other words, features of current life events facilitate the selective recall of similar past experiences. Reciprocally, memories influence the patients’ perceptions of current life situations. Thus, in the fourth register, while the past seems to be the exclusive focus, the Assess_Mind is also investigating the subject’s current mental state.

Until now the Assess_Mind has been mainly used in the research on the psychological dimensions of IVF. However, it can be used in a wide variety of psychological or psychopathological research problems. Encouraging pilot work has already been conducted in assessing HIV-infected patients, in investigating
postpartum depression, major depressive episodes, and in studying the psychological experience of ageing. Given its openness to very diverse contents, the Assess_Mind is well-adapted to exploratory studies of new fields or new situations for which the researcher has no a priori hypotheses. However, ratings derived from the scales can also be used in confirmatory studies, that is, to test a priori hypotheses.

Whereas the data collection module can be applied to diverse groups of subjects, most of the current rating scales are specific of the research on the psychological dimensions of IVF. We are currently developing a series of scales designed to be applicable to a wide range of clinical situations such as depressive or anxious disorders.

The Assess_Mind is similar to a group of instruments (e.g. Bellak, 1968; Luborsky et al., 1986; Vaillant et al., 1986; Weinryb and Rössel, 1991; Aguilar et al., 1996) which, although based on psychoanalytical theory, purport to yield reliable and valid quantitative data. However, whereas these instruments evaluate stable traits, the Assess_Mind has been conceived as an assessment of current state of mind. Thus, the Assess_Mind could complement these other instruments in providing measures that can vary from day to day. As it can be repeatedly administered, the Assess_Mind may be very useful to characterize the psychopathological state of psychiatric patients as they undergo episodes of their disorders or to study the psychological state of subjects as they experience various life events. Because the Assess_Mind is well-adapted to exploratory studies and because it is an assessment of current state of mind, we place hope in using it to identify psychotropic effects of new psychiatric drugs.

The Assess_Mind may also be used fruitfully in clinical practice to complement structured diagnostic interviews, using an approach which, although standardized, reveals the meanings that patients attach to their current experiences. Because of this emphasis on the patient’s perspective, the Assess_Mind is related to interviews based on a phenomenological approach (Giorgi and Giorgi, 2003). However, it differs from these interviews because its administration is based on an explicit algorithm and because of the use of rating scales.

It should also be acknowledged that the current research version of the instrument needs about 75 minutes for administering the interview and about four hours to rate the transcripts. These durations are about the same as those needed for instruments belonging to the same category, such as the AAI. We are currently developing a faster version, with a reduced time per register – 9 minutes instead of 15 minutes – with a proportionately reduced time for rating. In addition, we are testing the reliability and validity of ratings assigned immediately after interviews, that is, not based on transcripts or audiotapes.

In this paper, we have described the Assess_Mind and illustrated the range and the depth of clinical information it yields. We have shown that it incorporates advantages of unstructured interviews, such as unlimited range of potentially covered themes and possibility to record sequence of ideas expressed by subjects. Additionally, in describing the algorithm and the scales, we have shown
that the interviewers’ interventions were standardized, that all registers were systematically explored with the same sequence in all subjects, and that interviewers were requested to follow a detailed and explicit algorithm. We have thus showed that the instrument has the potential to meet usual criteria of quality for structured interviews, that is, reliability and validity. These characteristics of the instrument remain to be demonstrated and this study will form the subject of the second part of this twofold article. (Le Mer and Stoléru, 2007)

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