Assessment of premorbid function in first-episode schizophrenia: modifications to the Premorbid Adjustment Scale

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Studies have found Cannon-Spoor's Premorbid Adjustment Scale (PAS) to be a useful measure of premorbid function and an effective predictor of outcome in patients with chronic schizophrenia. Despite its widespread use, the applicability and reliability of the scale for use with young patients who experience their first episode of schizophrenia have not been thoroughly examined. We review the studies that used the PAS to assess premorbid function in patients with either chronic or first-episode schizophrenia. Difficulties that have been encountered with the use of the PAS in first-episode patients are presented, and modifications that have been made to the scale by various research groups are described. Finally, we make recommendations to enhance the use of the PAS when evaluating patients who have experienced their first episode of schizophrenia.

Des études ont révélé que l'échelle d'adaptation prémorbide de Cannon-Spoor (PAS) est une mesure utile du fonctionnement prémorbide et un prédicteur efficace du résultat chez les patients atteints de schizophrénie chronique. Bien que l'échelle soit couramment utilisée, son applicabilité et sa fiabilité auprès des jeunes patients qui vivent leur premier épisode de schizophrénie n'ont pas été examinées à fond. Nous examinons les études qui ont recouru à l'échelle PAS pour évaluer le fonctionnement prémorbide de patients atteints de schizophrénie chronique ou de patients connaissant leur premier épisode schizophrénique. Les difficultés d'utilisation de l'échelle PAS dans l'évaluation des patients en premier épisode de schizophrénie sont présentées, et les modifications que divers groupes de recherche ont apportées à l'échelle sont décrites. Enfin, nous formulons des recommandations pour l'amélioration de l'utilisation de l'échelle PAS dans l'évaluation des patients en premier épisode de schizophrénie.

Introduction

In the Calgary Early Psychosis Program, a well-established comprehensive treatment program for young people experiencing their first episode of psychosis, premorbid functioning is an important variable under study. Research that focuses on development of psychosis, first-episode psychosis, early detection and early intervention has begun to identify and define different phases in the development of the illness. Larson

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et al[1] describe the premorbid period, the prodromal period and the period of untreated psychosis before adequate treatment begins. Understanding and distinguishing between these periods is crucial to future research, early detection and illness management. Thus, an appropriate measure that supports these goals and is both valid and reliable for first-episode samples is required.

The Premorbid Adjustment Scale (PAS) developed by Cannon-Spoor and colleagues[2] is our measure of choice for assessing premorbid functioning in our clinical and research programs. However, in newly diagnosed patients, we began to experience some difficulty with this measure, particularly with the general section of the scale, which contains questions that may not be appropriate for first-episode subjects. We also had questions about the reliability of the scale, the training of the test administrators and the anchor points provided.

In this paper, we review the literature on premorbid functioning in individuals with chronic schizophrenia and those who are experiencing their first episode. We then narrow our focus to studies that have used the PAS to assess premorbid functioning and note the problems that have been encountered with its use. We also contacted research groups that were likely to have used this scale with first-episode patients to determine if they had experienced difficulties, and we review studies that used a modified version of the PAS. Finally, we make specific recommendations for further use of the PAS with patients who have experienced their first episode of schizophrenia.

Studies of premorbid functioning in individuals with established schizophrenia

Studies use a range of measures of premorbid functioning. Research has shown poor premorbid functioning in individuals with schizophrenia to be related to such factors as early and insidious onset,[2–10] poor clinical outcome and relapse.[3,5,10–18] Negative symptoms,[4,5,8,11,15,19] pronounced cognitive and neurological deficits[6,11,20,21] and abnormal computed tomographic (CT) and positron-emission tomographic scans[2,15,22–25] are also related to poor premorbid functioning. In addition, poor premorbid adjustment appears to be more common in patients with schizophrenia who exhibit electrodermal nonresponding,[16] decreased event potentials[20] and lower quartile birth weight and height.[21,22] Further, studies comparing nonpsychiatric subjects, subjects with schizophrenia and those who exhibit schizoaffective and major affective disorders show that those with schizophrenia exhibit the poorest premorbid adjustment overall. This adjustment is characterized by early and progressive deterioration in social functioning, which rarely improves over time.[5,7,8,26–28]

Level of premorbid functioning has also been used to distinguish between possible subtypes of schizophrenia including process versus reactive,[6] paranoid versus nonparanoid,[4,29] deficit versus nondeficit[18,19,27] and deteriorating versus nondeteriorating types.[7,27] Finally, sex differences have emerged in research examining premorbid functioning in patients with schizophrenia. It has been clearly illustrated that males experience poorer premorbid social adjustment, earlier age of onset and a greater degree of deterioration across both the premorbid and morbid period, than do females.[3,4,7,9,11,13,19,29,30]

Studies of premorbid functioning in patients experiencing a first episode of schizophrenia

Results of studies conducted with individuals experiencing a first episode of psychosis are similar to those with individuals who have a chronic course of illness. Women tend to display better premorbid adjustment than men.[1,13,30] Poor premorbid functioning appears to be associated with cognitive impairment;[31] poor adaptation to school;[17] poor social, sexual and occupational functioning;[5] long duration of untreated psychosis;[1,32] negative symptoms[32] and delayed remission of positive symptoms.[13] In a study examining the relation between premorbid functioning and resting cerebral glucose metabolism levels in first-episode and previously treated patients with schizophrenia, higher metabolism and lower left hemispheric values were related to better premorbid adjustment and outcome.[24]

Premorbid Adjustment Scale

Several scales have been developed to measure social functioning during the premorbid period. The Elgin Prognostic Scale was the first of its kind.[33] In 1953, Phillips[34] devised the second major and most widely used of the ordinal prognostic rating scales, and in 1969, Gittelman-Klein and Klein[35] developed the Pre-

morbid Asocial Adjustment Scale. The PAS, developed by Cannon-Spoor et al,[2] is a compilation of items from each of these scales and was developed with the goals of research in mind. Currently, it is one of the most widely used measures of premorbid adjustment in schizophrenia populations.

The PAS was designed to measure premorbid functioning from a developmental perspective, conceptualizing good premorbid adjustment as the achievement of age-appropriate developmental and social milestones. The scale examines 4 areas of development:

- sociability and withdrawal
- peer relationships
- ability to function outside of the nuclear family and
- capacity to form intimate socio-sexual ties

at each of 4 developmental stages (i.e., childhood [up to age 11], early adolescence [12–15 years], late adolescence [16–18 years] and adulthood [19 years of age and older]). In addition to the 4 developmental scales, the PAS includes a general scale that assesses factors such as the level of best functioning achieved by the individual, as well as items related to characteristics of illness onset, energy level, education and independence.

The premorbid period, as defined by Cannon-Spoor et al,[2] ends 6 months before the first admission to hospital or the onset of florid psychotic symptoms, and, as such, the test is completed only for the developmental periods that apply to this time frame. For example, if a patient was 19 at the time of completing the scale, but was first admitted to hospital with psychotic symptoms at the age of 17, only the childhood, early adolescence and late adolescence developmental scales would be completed.

All PAS ratings are based on interviews with patients, their family members or both, and each item is scored on a Likert-type scale of 0–6, where lower numbers indicate normal, healthy functioning and higher numbers suggest pathologic development. Phrased anchor points are given for each item to aid in scoring. In situations where, for any reason, there is insufficient information to complete an item, it is not scored and the item is excluded in the calculation of the overall score.

Scores for each of the subscales are calculated by dividing the obtained score by the total possible score for that section. The overall PAS score is calculated by averaging the scores obtained on each of the developmental subscales and on the general section. Ratings for both the subscales and the overall PAS score are expressed as decimal point numbers ranging from 0.0 to 1.0, where lower numbers represent the "healthiest" level of functioning.[2]

Several studies have used Cannon-Spoor's PAS in its original form to assess different aspects of schizophrenia in patients with chronic illness. In their original study, Cannon-Spoor et al[2] found premorbid function, as measured by the PAS scores, was useful to distinguish between nonpsychotic controls and patients with schizophrenia, patients frequently admitted to hospital and those with an outpatient status, and patients who experienced insidious versus acute onset. In addition, they found the PAS to be an effective predictor of abnormal CT scans and length of hospitalization.

Although many studies have used the PAS to assess premorbid functioning,[8,11,12,36,37] few have assessed the reliability or validity of the scale. Krauss et al[8] undertook this task in a sample of German patients with schizophrenia and schizoaffective disorder and found high intercorrelations between each of the subscales and the overall PAS score.

Research assessing premorbid functioning in first-episode patients using Cannon-Spoor's PAS has been limited. Amminger and colleagues[13] investigated the relation between premorbid adjustment and short-term therapeutic outcome in first-episode psychosis in adolescents, and Robinson et al conducted a longitudinal follow-up to assess predictors of relapse.[17] Other studies include the work of Larsen et al,[1,9,32] Haas and Sweeney,[7] and that of Chakos et al,[38] Fannon et al[31] and Gureje et al.[19]

Problems with the PAS for first-episode patients

Our first concern with the PAS is with the general section of the scale, especially when it is used to assess young, first-episode patients. A significant number of our patients are under 18 years of age, and several items on the general scale either do not apply or are inappropriate for these young people. For example, high school students receive low scores if they live at home, are dependent on their parents or have not finished high school, even if these are appropriate for their age. Many of the individuals in our program are in their early twenties and are university students, who also often live at home.

In addition, several items on the general scale do not assess premorbid function, but rather, a global measure of current or best functioning achieved by these pa-

tients. Also, as identified by Bailer et al,[3] there is the possibility of "contaminating" the early morbid period with questions that assess functioning during the 3 years and up to 6 months before illness onset. If the patient experiences insidious onset, this time frame may, in fact, include the early period of illness. Additionally, because of the nature of an early psychosis program, where one of the goals is early detection and intervention, we are working with individuals who have experienced symptoms for only a few months or even a few weeks. As a result, at times, the administration of the PAS is difficult because the time frame given in the scale is inappropriate for these individuals. For example, even if there has been an "abrupt change," it may not have occurred in the time frame provided.

Furthermore, because the overall PAS score is calculated by averaging the scores on each of the subscales, the general scale is weighted more heavily in the overall score for young patients who have an early age of onset. This is because fewer developmental subscales are completed.

Upon consideration of the many flaws with the use of the general section for first-episode samples, it becomes clear that this uneven weighting of the general scale in the overall scoring of the PAS is a fundamental problem with the measure. Overall, we do not find the general section of the scale to be particularly useful; it may, in fact, be unfairly biased against young patients.

We assess premorbid functioning from the patient's perspective and use collaborative information collected from a relative, usually a parent; inter-rater reliability is therefore crucial. In our examination of the literature, we discovered that, of 42 studies reviewed for this paper, only 1 had examined the reliability of the PAS in depth.[8] In this paper, estimation of the reliability of the subscales with one another showed high positive values of Cronbach's alpha between 0.81 and 0.93.

A third problem relates to the fact that there are no recent data provided on many of the anchor points, and only 1 study had attempted to standardize the administration of the scale and its anchor points.[37] As well, Amminger et al[13] report asking questions within a standardized semistructured interview, which was generated for the purpose of the study. These authors also included 10 sessions of supervised PAS ratings.

Some of the anchor points in the PAS are vague, and this has caused confusion for scoring among raters. For example: Is a high school student who is in a "vocational" school and doing very well rated as a "good student," or is he rated as less than fair because this is likely the level that would be accomplished if he were in a regular high school classroom? We have also identified problems with the anchor points used to assess sociosexual functioning in adulthood. A homosexual relationship must last longer than a heterosexual relationship to obtain the same score. There is no clear justification for this discrepancy, and as such, we do not believe it is necessary. In addition, if an individual is over 30 years of age and not married, they can score a maximum of 2; there is no opportunity for these individuals to score a 0 or 1 on this item. Because it is no longer unusual for individuals to be single at the age of 30, this should not be used as an indication of social dysfunction. This item has less relevance for our program because of the age group that we work with, but researchers might wish to re-examine the scoring of this item and the social implications of its use for older, more chronically ill patients.

Some researchers have expressed specific criticisms of the scale. Buchanan et al[18] excluded the general scale because it was not primarily a measure of premorbid function, but rather an assessment of best functioning and onset features. Bailer et al[3] expressed concern with items 2, 3 and 4 of the general scale, suggesting that they may actually be measuring early morbid function in patients who experience insidious onset.

We also contacted several research groups throughout North America who use the PAS in their research programs and asked them to identify any problems they have encountered with the use of the PAS and any modifications they had made. Several stated that there were obvious problems, particularly with young patients, but few had made any formal modifications in their use of the scale.

Modifications to the PAS

The most common modifications to the PAS reported in the literature are exclusion of the general scale,[13,17,18,38] the adult scale[27] or both.[20,28] Unfortunately, in many cases where modifications have been made, there is little or no explanation given about why specific sections have been excluded.

In a study conducted by Gureje et al[19] of premorbid functioning in Nigerian patients, the PAS was translated and modified quite extensively. The researchers assessed early and late adolescents together and deleted sections dealing with scholastic performance because of

the lack of a formal education system in Nigeria. The researchers also excluded the general section because they suggested it is not strictly a measure of premorbid function. In addition to the aforementioned translation, the PAS has also been formally translated for use in research programs in Poland,[36] Norway[1] and Spain.[39]

Some researchers have made changes to the original PAS by adding, rather than excluding sections of the scale. Morice et al[37] developed a structured interview to ensure standardized administration of the scale. Smith and colleagues of the University of British Columbia have added 12 questions aimed at assessing aspects of premorbid functioning not measured by the PAS.[40] In contrast, Bailer et al[3] used the general scale alone as a predictor of outcome.

Andreasen and colleagues at the University of Iowa have developed a modified version of a premorbid scale, the Modified Premorbid Adjustment Scale (MPAS).[41] This alternative 24-item scale was adapted from the Premorbid Asocial Adjustment Scale developed by Gittelman-Klein and Klein[35] and is part of the Comprehensive Assessment of Symptoms and History (CASH) battery. The MPAS divides the premorbid period into childhood (6–12 years of age) and adolescence (13–21 years of age). The major modifications are in the sociosexual section of the earlier scale that these authors considered to be "outdated and unduly prescriptive."[41] Additionally, they excluded several items from the original scale and extended the premorbid period from 6 months to 1 year before onset. They report good inter-rater reliability and test–retest reliability.[5,41]

Recommendations

One obvious option to overcome these problems is to use a different scale that is relevant for the populations being studied and has established reliability and validity (e.g., MPAS from the CASH). However, the PAS is a widely used scale and could continue to be very valuable if some changes were made. On the basis of the above review, we are making several specific recommendations that we have recently put into practice in our own research with first-episode subjects.

- The general scale should not be used. However, because this affects the overall total, the general scale score should be reported so that results from different studies can be compared.
- Methods of training and inter-rater reliability should be reported.
- Reasons for deviating from the published scales should be provided.
- We have written a supplementary scoring manual with definitions of some of the terms and anchors that will better enable raters to make objective and reliable assessments of premorbid function. These minor changes are in ***italics*** in the scale in Appendix 1.
- To ensure that both homosexual and heterosexual relationships are scored equally, we have modified item 3 in the adulthood subscale: aspects of adult social-sexual life.
- The date of onset of the psychotic illness must be established before one can determine when the premorbid period ended. There is much debate about determining the date of onset. Current research is examining the development of psychotic symptoms, conversion rates to psychosis and accurately determining prodromal symptoms. We make some recommendations here on how to determine the time of onset, but as new ideas and evidence emerges, it may be that determining onset will require revision. The goal is to attempt to find a point in time when the individual had no experience of symptoms and then work toward the time when symptoms began. This is often difficult to determine accurately and, for many individuals, there is a lengthy prodromal period.

  At the present time, we make the following recommendations:

  (1) We recommend first estimating a date when the symptoms first appeared such that they were noticeable and of concern. These symptoms should be clearly noticed by the individual, the family or both. They may be bothersome to the individual or even impair his or her functioning in some way. At least 1 positive symptom should be rated a 4 or more on the PANSS (Positive and Negative Syndrome Scale).

  (2) Then, as Andreasen's group[41] has done, we recommend that the end of the premorbid period be taken as **1 year** before that date. It is preferable to underestimate the length of the premorbid period than to overestimate it.
- We recommend that researchers make use of both the total score (without the general score) and the individual subscores. The overall score will give an accurate estimate of premorbid functioning over the whole period and is useful for considering issues of poor versus good premorbid functioning. The indi-

vidual scores are useful for comparing individuals whose premorbid functioning declined during different development periods as well as considering the impact of early versus late decline on illness course.

- The PAS should be completed as a semistructured interview. If possible, it is recommended that the interview be conducted with both the patient and a family member. The final scores should be based on a combination of the information gathered from different sources. It is always possible to clarify some questions later, particularly if patients are in an improved clinical state.

In summary, we believe that the PAS is a worthwhile scale to use. It does, however, require some updating and modifications, and these need to be standardized, particularly if the scale is to be used to study the early development of psychotic illnesses (i.e., both the premorbid and prodromal periods). This is particularly important considering some of the questions that may arise with the presentation of early symptoms. It is possible that negative symptoms may predate positive symptoms, and the onset of the "psychotic illness" would therefore be marked by negative rather than by positive symptoms. Since some negative symptoms reflect a decline in social and emotional functioning, this may make it difficult to differentiate early negative symptoms from a decline in social functioning in the premorbid period. However, until the issue of early negative symptoms has been more fully researched, a decline in social functioning is best rated as poor functioning during the premorbid period. This further supports the need for a clearly defined and updated premorbid scale.

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Appendix 1: Premorbid Adjustment Scale with modifications

Instructions

This scale is designed to measure **only premorbid functioning**, where "premorbid" is defined as the period ending ***12 months*** before evidence of characteristic florid psychotic symptomatology.

Only those life periods that are **premorbid** by this definition should be rated on this scale, regardless of the present age of the subject (e.g., a 39-year-old who had his first psychotic episode at age 17 would not be rated on the adult section, but would be rated on all other sections including the general section). *In order to determine if a particular section should be scored, the onset date recorded in the chart should be consulted. If the individual showed signs of psychotic symptoms less than 12 months prior to this date, the section corresponding to this time frame should not be scored because it does not fall under the "premorbid period."*

Scoring

Items are rated from 0 to 6. If it is impossible to rate an item, it should be marked as N/A (not available) on the scoring sheet. The possible score indicates the highest score obtainable by adding the maximum score for all items **completed** (e.g., if a subject receives ratings of 2, 3, 3 and 2 for the 4 items in the childhood section, the total score is 10. The possible score is 6 + 6 + 6 + 6 = 24. The total score divided by the possible score is 0.42). The score for any one section is expressed as a total score divided by possible score for the items rated. If only 3 items could be rated, then the possible score would be 18 (6 + 6 + 6), the total score would be 8 (2 + 3 + 3) and the section score 0.44.

The overall score is obtained by averaging all the subscale scores.

When scoring particular items, the patient need not meet all criteria set out in the anchor points. For example, on item 1 (sociability and withdrawal), the anchor point given for a score of 4, a patient must show moderate withdrawal. Daydreaming and excessive fantasy are offered in the anchor point to suggest the types of behaviour that might be exhibited by an individual who would receive this score. It is important to remember, however, that these are simply guidelines, and the individual is not required to meet all of the criteria offered in the anchor point in order to receive that score.

Appendix 1 cont.

Childhood (up through age 11)

1. Sociability and withdrawal
- 0 - Not withdrawn, actively and frequently seeks out social contacts
- 2 - Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize
- 4 - Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others, but does not seek it
- 6 - Unrelated to others, withdrawn and isolated, avoids contacts

2. Peer relationships
- 0 - Many friends (*more than 5*), close relationships ("*best friends" or people you could confide in*) with several
- 1 - *2–5 friends*
- 2 - Close relationships with a few friends (1 or 2), casual friendships with others
- 3 - *Only casual friends*
- 4 - Deviant (*unusual*) friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only
- 6 - Social isolate, no friends, not even superficial relationships

3. Scholastic performance (*as compared with all other students that age in the general population [i.e., a student doing very well in a special needs school would rate no higher than a 4]*)
- 0 - Excellent student (*straight A's – likely to attend a post-secondary institution*)
- 1 - *A's and B's* (*likely to pursue post-secondary studies*)
- 2 - Good student (*B's – post-secondary*)
- 3 - *Average student* (*B's and C's*)
- 4 - Fair student (*C's*)
- 5 - *D's – failing some classes*
- 6 - Failing all classes

4. Adaptation to school
- 0 - Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers
- 1 - *Likes school, few discipline problems*
- 2 - Fair adaptation, occasional discipline problems, not very interested in school, but no truancy or rare. Has friends in school, but does not often take part in extracurricular activities
- 3 - *Sometimes truant*
- 4 - Poor adaptation, dislikes school, frequent truancy, frequent discipline problem (*may have been suspended*)
- 5 - *Expelled from school*
- 6 - Refuses to have anything to do with school — delinquency or vandalism directed against school

Early adolescence (12–15 years of age)

1. Sociability and withdrawal
- 0 - Not withdrawn
- 2 - Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize
- 4 - Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others, but does not seek it
- 6 - Unrelated to others, withdrawn and isolated, avoids contact

2. Peer relationships
- 0 - Many friends (*more than 5*), close relationships ("*best friends" or people you could confide in*) with several
- 1 - *2–5 friends*
- 2 - Close relationships with a few friends (1 or 2), casual friendships with others
- 3 - *Only casual friends*
- 4 - Deviant (*unusual*) friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only
- 6 - Social isolate, no friends, not even superficial relationships

3. Scholastic performance (*as compared with all other students that age in the general population [i.e., a student doing very well in a special needs school would rate no higher than a 4]*)
- 0 - Excellent student (*straight A's – likely to attend a post-secondary institution*)
- 1 - *A's and B's* (*likely to pursue post-secondary studies*)
- 2 - Good student (*B's – post-secondary*)
- 3 - *Average student* (*B's and C's*)
- 4 - Fair student (*C's*)
- 5 - *D's – failing some classes*
- 6 - Failing all classes

4. Adaptation to school
- 0 - Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers
- 1 - *Likes school, few discipline problems*
- 2 - Fair adaptation, occasional discipline problems, not very interested in school, but no truancy or rare. Has friends in school, but does not often take part in extracurricular activities
- 3 - *Sometimes truant*
- 4 - Poor adaptation, dislikes school, frequent truancy, frequent discipline problem (*may have been suspended*)
- 5 - *Expelled from school*
- 6 - Refuses to have anything to do with school — delinquency or vandalism directed against school

5. Social-sexual aspects of life during early adolescence
- 0 - Started dating, showed a "healthy interest" in the opposite sex, may have gone "steady," may include some sexual activity
- 1 - Attachment and interest in others, may be same-sex attachments, may be a member of a group, interested in the opposite sex, although may not have close, emotional relationship with someone of the opposite sex, "crushes" and flirtations
- 2 - Consistent deep interest in same-sex attachments with restricted or no interest in the opposite sex
- 3 - Casual same-sex attachments with inadequate attempts at relationships with the opposite sex. Casual contacts with both sexes
- 4 - Casual contacts with the same sex, no interest in the opposite sex
- 5 - A loner, no or rare contacts with either boys or girls
- 6 - Antisocial, avoids and avoided by peers (differs from above in that an active avoidance of others rather than a passive withdrawal is implied)

Appendix 1 cont.

Late adolescence (16–18 years of age)

1. Sociability and withdrawal
- 0 - Not withdrawn
- 2 - Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize
- 4 - Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others, but does not seek it
- 6 - Unrelated to others, withdrawn and isolated, avoids contact

2. Peer relationships
- 0 - Many friends (*more than 5*), close relationships (*"best friends" or people you could confide in*) with several
- 1 - *2–5 friends*
- 2 - Close relationships with a few friends (1 or 2), casual friendships with others
- 3 - *Only casual friends*
- 4 - Deviant (*unusual*) friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only
- 6 - Social isolate, no friends, not even superficial relationships

3. Scholastic performance (*as compared with all other students that age in the general population [i.e., a student doing very well in a special needs school would rate no higher than a 4])*
- 0 - Excellent student (*straight A's – likely to attend a post-secondary institution*)
- 1 - *A's and B's* (*likely to pursue post-secondary studies*)
- 2 - Good student (*B's – post-secondary*)
- 3 - *Average student* (*B's and C's*)
- 4 - Fair student (*C's*)
- 5 - *D's – failing some classes*
- 6 - Failing all classes

4. Adaptation to school
- 0 - Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers
- 1 - *Likes school, few discipline problems*
- 2 - Fair adaptation, occasional discipline problems, not very interested in school, but no truancy or rare. Has friends in school, but does not often take part in extracurricular activities
- 3 - *Sometimes truant*
- 4 - Poor adaptation, dislikes school, frequent truancy, frequent discipline problem (*may have been suspended*)
- 5 - *Expelled from school*
- 6 - Refuses to have anything to do with school — delinquency or vandalism directed against school

5. Social-sexual aspects of life during early adolescence
- 0 - Always showed a "healthy interest" in the opposite sex, dating, has gone "steady," has engaged in some sexual activity (not necessarily intercourse)
- 1 - Dated regularly. Had only one friend of the opposite sex with whom the subject went "steady" for a long time. (Includes sexual aspects of a relationship, although not necessarily intercourse; implies a twosome, pairing off into couples as distinguished from below)
- 2 - Always mixed closely with boys and girls. (Involves membership in a crowd, interest in and attachment to others, no couples)
- 3 - Consistent deep interest in same-sex attachments with restricted or no interest in the opposite sex
- 4 - Casual same-sex attachments with inadequate attempts at adjustment to going out with the opposite sex. Casual contacts with both sexes
- 5 - Casual contacts with the same sex, with a lack of interest in the opposite sex. Occasional contacts with the opposite sex
- 6 - No desire to be with boys and girls, never went out with the opposite sex

Adulthood (age 19 and above)

1. Sociability and withdrawal
- 0 - Not withdrawn, actively and frequently seeks out social contact
- 2 - Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize
- 4 - Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others, but does not seek it
- 6 - Unrelated to others, withdrawn and isolated, avoids contact

2. Peer relationships
- 0 - Many friends (*more than 5*), close relationships (*"best friends" or people you could confide in*) with several
- 1 - *2–5 friends*
- 2 - Close relationships with a few friends (1 or 2), casual friendships with others
- 3 - *Only casual friends*
- 4 - Deviant (*unusual*) friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only
- 6 - Social isolate, no friends, not even superficial relationships

3. Aspects of adult social-sexual life

A. Married presently or formerly
- 0 - Married, only one marriage (or remarried as a result of death of spouse), living as a unit, adequate sexual relations
- 1 - Currently married with a history of low sexual drive, periods of difficult sexual relations, or extramarital affair
- 1 - Married more than one time, currently remarried. Adequate sexual relations during at least one marriage
- 2 - Married, or divorced and remarried, with chronically inadequate sex life
- 2 - Married and apparently permanently separated or divorced without remarriage, but maintained a home in one marriage for at least 3 years
- 3 - Same as above, but divorce occurred over 3 years ago and while married, maintained a home for less than 3 years

B. Never married, over 30 years of age
- 2 - Has been engaged one or more times or has had a long-term relationship (at least 2 years) involving heterosexual or homosexual relations, or apparent evidence of a love affair with one person, but unable to achieve a long-term commitment such as marriage
- 3 - Long-term heterosexual or homosexual relationship lasting over 6 months, but less than 2 years
- 4 - Brief or short-term dating experiences (heterosexual or homosexual) with one or more partners, but no long-lasting sexual experience with a single partner
- 5 - Sexual and/or social relationships rare or infrequent

Appendix 1 cont.

6 - Minimal sexual or social interest in either men or women, isolated

C. Never married, age 19–29 years

0 - Has had at least one long-term love affair (minimum 6 months) or engagement, even though religious or other prohibitions or inhibitions may have prevented actual sexual union. May have lived together

1 - Has dated actively, had several "boyfriends" or "girlfriends." Some relationships have lasted a few months, but no long-term relationships. Relationships may have been serious but a long-term commitment such as marriage was not understood to be an eventuality

3 - Brief or short-term dating experiences or affairs with one or more partners, but no long-lasting sexual experience with a single partner

4 - Casual sexual or social relationships with persons of either sex with no deep emotional bonds

5 - Sexual and/or social relationships rare or infrequent

6 - Minimal sexual or social interest in either men or women, isolated

General (not used)

1. Education

0 - Completed college and/or graduate school or professional school

1 - Completed high school and some college or vocational training or business school

2 - Completed high school

4 - Completed grade 8

6 - Did not get beyond grade 5

2. During a period of 3 years up to 6 months before first hospitalization or onset of first episode, patient was employed for pay or functioning in school

0 - All the time

2 - Half the time

4 - Briefly, about 25% of the time

6 - Never

3. Within a period of 1 year up to 6 months before first hospitalization or onset of first episode, change in work or school performance occurred

0 - Abruptly

2 - Within 3 months

4 - Within 6 months

6 - Imperceptibly, difficult or not possible to determine onset of deterioration

4. During a period of 3 years up to 6 months before first hospitalization or onset of first episode, frequency of job change, if working, or interruption of school attendance was:

0 - Same job held or remained in school

2 - Job change or school interruption occurred 2–3 times

4 - Kept the same job for more than 8 months, but less than 1 year, or remained in school continuously for the same period

6 - Less than 2 weeks at a job or in school

5. Establishment of independence

0 - Successfully established residence away from family home, financially independent of parents

2 - Made unsuccessful attempts to establish independent residence, lives in parents' home but pays room and board, otherwise financially independent

4 - Lives in parents' home, receives an allowance from parents which subject budgets to pay for entertainment, clothes, etc.

6 - Made no attempt to leave home or be financially independent

6. Global assessment of highest level of functioning achieved in subject's life

0 - Fully able to function successfully in and take pleasure from (1) school or job; (2) friends; (3) intimate sexual relationships; (4) church, hobbies etc. Enjoys life and copes with it well

2 - Able to function well and enjoys some spheres of life, but has a definite lack of success in at least one area

4 - Minimum success and pleasure in 3 areas of life

6 - Unable to function in or enjoy any aspect of life

7. Social-personal adjustment (based on most recent period of good functioning)

0 - A leader or officer in formally designated groups, clubs, organizations or athletic teams in senior high school, vocational school, college or young adulthood. Involved in intimate close relationships with others

1 - An active and interested participant, but did not play a leading role in groups of friends, clubs, organizations or athletic teams. Was involved in close relationships with others also.

2 - A nominal member but had no involvement in or commitment to groups of friends, clubs, organizations, etc. Had close relationships with a few friends

3 - From adolescence through early adulthood had a few casual friends

4 - From adolescence through early adulthood had no real friends, only superficial relationships

5 - From adolescence through early adulthood, quiet, reclusive, preferred to be by self, minimal efforts to maintain any contact at all with others

6 - No desire to be with peers or others. Either asocial or antisocial

8. Degree of interest in life

0 - Keen, ambitious interest in some of the following: home, family, friends, work, sports, art, pets, gardening, social activities, music and drama

2 - Moderate degree of interest in several activities including social gatherings, sports, music and the opposite sex

4 - Mild interest in a few things such as job, family, quiet social gatherings. The interest is barely sustaining

6 - Withdrawn and indifferent toward life interests of average individual. No deep interests of any sort

9. Energy level

0 - Strong drive, keen, active, alert, interest in life. Liked life and had enough energy to enjoy it. Outgoing and adequate in meeting life

2 – Moderately adequate drive, energy, interest as described above

4 - Moderately inadequate energy level. Tended toward submissive, passive reactions. Showed some potential to face life's problems, but would rather avoid them than expend the necessary energy

6 - Submissive, inadequate, passive reactions. Weak grasp on life, does not go out to meet life's problems, does not participate actively, but passively accepts his lot without having the energy to help self