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## Bottom-up rehabilitation in schizophrenia

Appelo, Martinus Theodoor

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## 8. Results.

### 8.1 Introduction.

To evaluate the effect of the programme, all 54 patients who participated in the rehabilitation programme for 75% or more, were rated five times. Twenty-seven patients participated in the cognitive skills training condition (condition 1a) and twenty seven patients participated in the standard condition of the programme (condition 1b).

In the drop-out condition (condition 2; n=24) only 9 patients (condition 2a) completed the first and third testing. However, at the final assessment the accommodation of all drop outs could be determined.

Patients participating in the 'long stay' control condition (condition 3; n=17) were rated at the first and third moment of assessment with an interval of eight months. At the fifth assessment accommodation and daily activities were administered.

After 55 months of data collection, 0.9% of the data concerning the 80 patients fully participating in the assessments (54+9+17) were missing values. Because of this low percentage, missing values were replaced by mean scores in every condition.

### 8.2 Correlations at the first assessment.

In table 8.1 the correlation coefficients of variables at the first assessment are presented. As expected, the correlation coefficients between the independent demographic variables show that duration of illness is related to age; a longer duration of illness presumes a more advanced age.

The correlations between the independent and dependent variables show that age is related to REHAB, SSIT-C and POV. If patients are older general behaviour, competence of social skills and psychomotor poverty tends to be worse. Level of education is related to DIGITS and SSIT-C. A higher level of education presupposes better performance on reproduction of declarative information, and higher competence of social skills. Duration of illness is related to CPT-d', REHAB and SSIT-C. If patients have longer duration of illness information processing, general behaviour and competence of social skills is worse.

In section 7.2 it was decided to include age and duration of illness as covariates in the analyses comparing the rehabilitation, drop-out and control conditions. Age and prior admissions have to be included as covariates in the analyses comparing both rehabilitation conditions. Although shared variance between dependent and independent variables is never high (maximum 12%), it is decided here on the basis of the results presented in table 8.1 to also include level of education as a covariate in the analyses on DIGITS and SSIT-C, and to include duration of illness as a covariate in every analysis on SSIT-C and REHAB.

Concerning the interrelation between dependent variables, the most striking finding is the relation of CPT-d' with DIGITS, HANOI, REHAB, SSIT-C and DIS. Although shared variance is never high (maximum 22%; REHAB), this may be conceived as a (narrow) confirmation of the concept of pervasiveness of cognitive disturbances at the first learning stage; low CPT-d' score supposes less reproduction of declarative information, more steps to complete the Tower of Hanoi, less social and general

competence (SSIT-C and REHAB), and more profound disorganization. Also, this results illustrates the independency of reality distortion and response variability (correlation coefficient is .06).

**Table 8.1: Correlation Coefficients first assessment (n=80).**

|                        | 1.    | 2.    | 3.     | 4.     | 5.     |       |
|------------------------|-------|-------|--------|--------|--------|-------|
| 1. Age                 | 1.00  |       |        |        |        |       |
| 2. Level of education  | -.13  | 1.00  |        |        |        |       |
| 3. Duration of illness | .77** | -.09  | 1.00   |        |        |       |
| 4. Prior admissions    | .21   | .03   | .26    | 1.00   |        |       |
| 5. CPT-d'              | -.26  | .22   | -.31*  | -.24   | 1.00   |       |
| 6. WCST-P              | .19   | -.26  | .14    | .27    | -.28   |       |
| 7. DIGITS              | .04   | .31** | -.04   | .11    | .32*   |       |
| 8. HANOI               |       | .06   | -.23   | .18    | -.04   | -.30* |
| 9. REHAB               | .30*  | -.10  | .34**  | -.23   | -.47** |       |
| 10.UCL-P               |       | -.05  | -.04   | -.06   | .21    | .05   |
| 11.SSIT-C              | -.30* | .30*  | -.31** | .10    | .37**  |       |
| 12.SSIT-W              | -.14  | .18   | -.15   | .02    | .05    |       |
| 13.POV                 | .33*  | -.01  | .25    | -.08   | -.24   |       |
| 14.DIS                 | .15   | .08   | .16    | -.20   | -.36*  |       |
| 15.REA                 | .16   | -.05  | .27    | .13    | .06    |       |
|                        | 6.    | 7.    | 8.     | 9.     | 10.    |       |
| 6. WCST-P              | 1.00  |       |        |        |        |       |
| 7. DIGITS              | -.17  | 1.00  |        |        |        |       |
| 8. HANOI               | .22   |       | 1.00   |        |        |       |
| 9. REHAB               | .16   | -.09  | .20    | 1.00   |        |       |
| 10.UCL-P               |       | .12   | -.01   | .08    | 1.00   |       |
| 11.SSIT-C              | -.16  | .16   | -.09   | -.38** | .02    |       |
| 12.SSIT-W              | -.13  | .16   | -.08   | -.02   | .06    |       |
| 13.POV                 | -.02  | -.14  | .04    | .27    | -.30*  |       |
| 14.DIS                 | .09   | -.11  | .12    | .46**  | .01    |       |
| 15.REA                 | .05   | .20   | -.04   | .37**  | -.09   |       |
|                        | 11.   | 12.   | 13.    | 14.    | 15.    |       |
| 11.SSIT-C              | 1.00  |       |        |        |        |       |
| 12.SSIT-W              | .34*  | 1.00  |        |        |        |       |
| 13.POV                 | -.07  | -.14  | 1.00   |        |        |       |
| 14.DIS                 | -.30* | -.10  | .09    | 1.00   |        |       |
| 15.REA                 | -.19  | .01   | .18    | .31*   | 1.00   |       |

Two tailed significance:      \* = p < .01      \*\* = p < .001

It is no surprise that general behaviour (REHAB) is related to symptoms (DIS, REA; respectively, .46 and .37) and social competence (SSIT-C). Less competence of general behaviour presupposes more symptoms and less social competence.

SSIT-C and SSIT-W, both measures of the same task, are slightly related (.34). The same holds for problem-oriented coping (UCL-P) and the psychomotor poverty

syndrome. Profound psychomotor poverty presumes a less problem oriented coping style. Reality distortion is slightly related to disorganization. Shared variance is 10%.

Although some dependent variables are related, shared variance is never high. So, the overlap does not induce the inclusion of 'underlying' constructs as measures of evaluation.

### 8.3 Do drop-outs differ from non-drop-outs?

In section 7.2. it is concluded that being a drop-out is not dependent upon sex, source of reference, age, duration of illness, prior admissions or level of education. In this section it is determined whether drop-outs differ from non-drop-outs at the first assessment on any dependent variable of the present study. In table 8.2 the results on the comparison are presented (oneway analysis of variance) between the mean scores in condition 1 (rehabilitation condition) and condition 2 (drop-outs). If F-probability is  $> .05$  than the difference is considered to be non significant.

Table 8.2: Comparing drop-outs (n=24) to non-drop-outs (n=54).

| Variable | Df.   | Sum of Square | F-ratio | F-probability |
|----------|-------|---------------|---------|---------------|
| CPT-d'   | 1, 76 | 0.28          | 0.24    | n.s.          |
| WCST-P   | 1, 76 | 10.72         | 0.08    | n.s.          |
| DIGITS   | 1, 76 | 1.39          | 0.14    | n.s.          |
| HANOI    | 1, 76 | 10.03         | 0.03    | n.s.          |
| REHAB    | 1, 76 | 1320.82       | 2.47    | n.s.          |
| UCL-P    | 1, 76 | 4.91          | 0.35    | n.s.          |
| SSIT-C   | 1, 76 | 103.77        | 1.20    | n.s.          |
| SSIT-W   | 1, 76 | 0.48          | 0.85    | n.s.          |
| POV      | 1, 76 | 2.89          | 0.04    | n.s.          |
| DIS      | 1, 76 | 44.88         | 2.90    | n.s.          |
| REA      | 1, 76 | 6.40          | 0.51    | n.s.          |

In table 8.2 the highest F-ratio concerns disorganization (DIS). In the drop-out condition, the mean DIS-score is 5.3, while in the rehabilitation condition, the mean-score is 3.6. A high standard deviation in the drop-out condition (4.9) explains why this result is not significant ( $p=.09$ ). The same holds for REHAB, which shows the second highest F-ratio ( $p=.12$ ). The mean score in the drop-out condition is 42.0 (s.d.= 26.9). In the rehabilitation condition, mean score is 32.9 (s.d.= 21.5). Thus, in general it can be concluded that at the first assessment, drop-outs do not differ from patients who participated in the programme for 75% or more, on any measure. However, if patients have a very high disorganization score ( $> 10$ ) and very poor general behaviour ( $> 70$ ), it seems reasonable to assume that they are unable to participate in a rehabilitation programme as applied in the present study.

#### 8.4 The results of the programme.

In this section the results are presented of the programme on cognitive organization (DIGITS, HANOI and DIS), coping (UCL-P), social skills (SSIT-C and SSIT-W), general functioning (REHAB and POV), psychotic symptoms (REA), accommodation and daily activities. Central hypothesis is:

Hypothesis 1: Patients who have participated in the rehabilitation programme, will improve more on every outcome category compared to patients who have dropped out of the programme or have participated in a traditional long stay ward programme.

To test this hypothesis a comparison is made between subjects who participated in the rehabilitation programme (n=54; condition 1), the drop-outs who stayed on the ward but did not complete the first and third assessment (n=9; condition 2a), and the control subjects (n=17; condition 3) who participated in the traditional long stay ward programmes.

The first assessment is compared to the third assessment, using multivariate analysis of variance with repeated measures (T1 and T3) for every category (except accommodation and daily activities) with age and duration of illness as covariates. With regard to the analyses on DIGITS and SSIT-C, the level of education is also included as a covariate. To verify which conditions have improved significantly on which variables, results on the one-tailed T-tests are inspected as well.

The results on accommodation and daily activities are calculated using crosstabs and the Chi-square ( $X^2$ ) test for association. In each condition results on accommodation and daily activities have been assessed up to the one year follow-up. The results are presented in table 8.3, 8.4 and 8.5 and will be discussed in the next sub-sections. At the one year follow up the accommodation of all drop-outs (condition 2; n=24) was determined, in the 'drop-out-column' (table 8.5) the results of all drop outs are presented in parenthesis.

##### 8.4.1 Results on cognitive organization.

Results on DIGITS, HANOI and DIS show that only the main effect 'moment' is significant. This signifies that the cognitive organization has changed. The main effects 'condition' and the interaction effect 'condition x moment' are not significant. So, in all three conditions, cognitive organization have changed in the same direction.

The univariate results on DIGITS show that none of the conditions significantly have changed. Proceduralization improves in the rehabilitation and drop-out conditions and tends to improve in the control condition. Raw scores on disorganization decreases in all conditions. However, only the control condition has improved significantly.

To check which disorganization-items have not changed during the programme, the items constituting this measure were tested with one-tailed T-tests. The first assessment is compared to the third assessment for the drop-out condition (n=9) and the rehabilitation condition (n=54) (table 8.6).

Social inattentiveness, diminished understanding of speech and 'mannerisms' have not improved during the programme in the rehabilitation and drop-out conditions. If only the drop out results are analyzed, none of the items that constitute disorganization show improvement.

In summary, it is concluded that a better performance on cognitive organization is related to improved proceduralization. However, improvement cannot be attributed to participating in the rehabilitation programme.

**Table 8.3: MANCOVA results (rehabilitation, drop-out and control).**

| Category<br>(variable(s))                              | Sum of<br>Squares | Df | F-value | Significance<br>of F. |
|--|-------------------|----|---------|-----------------------|
| <b>Cognitive organization<br/>(DIGITS, HANOI, DIS)</b> |                   |    |         |                       |
| Condition  | 67.26             | 2  | 0.39    | .681                  |
| Regression   | 228.73            | 3  | 0.88    | .458                  |
| Moment   | 732.38            | 1  | 12.55   | .001                  |
| Condition x Moment                                     | 13.22             | 2  | 0.11    | .893                  |
| <b>Coping<br/>(UCL-P)</b>                              |                   |    |         |                       |
| Condition  | 1.37              | 2  | 0.03    | .970                  |
| Regression   | 0.77              | 2  | 0.02    | .983                  |
| Moment   | 2.68              | 1  | 0.58    | .449                  |
| Condition x Moment                                     | 8.13              | 2  | 0.88    | .418                  |
| <b>Social skills<br/>(SSIT-C, SSIT-W)</b>              |                   |    |         |                       |
| Condition  | 931.82            | 2  | 4.65    | .013                  |
| Regression   | 1301.79           | 3  | 4.33    | .007                  |
| Moment   | 144.25            | 1  | 6.12    | .016                  |
| Condition x Moment                                     | 22.97             | 2  | 0.49    | .616                  |
| <b>General functioning<br/>(REHAB, POV)</b>            |                   |    |         |                       |
| Condition  | 1679.75           | 2  | 1.77    | .177                  |
| Regression   | 4026.43           | 2  | 4.25    | .018                  |
| Moment   | 1911.75           | 1  | 18.87   | .000                  |
| Condition x Moment                                     | 356.07            | 2  | 1.76    | .179                  |
| <b>Reality distortion<br/>(REA)</b>                    |                   |    |         |                       |
| Condition  | 123.97            | 2  | 3.74    | .028                  |
| Regression   | 34.79             | 2  | 1.05    | .355                  |
| Moment   | 42.75             | 1  | 11.62   | .001                  |
| Condition x Moment                                     | 1.76              | 2  | 0.49    | .788                  |

Table 8.4: T-test results (rehabilitation, drop-out and control).

| Variable       | T1          | T3          | T-value | Significance |
|----------------|-------------|-------------|---------|--------------|
| <b>DIGITS</b>  |             |             |         |              |
| Rehabilitation | 11.1 (3.2)  | 11.6 (3.9)  | 1.32    | .096         |
| Control        | 11.1 (2.8)  | 11.1 (3.5)  | 0.11    | .457         |
| Drop-out       | 12.1 (2.4)  | 12.6 (3.3)  | 0.63    | .278         |
| <b>HANOI</b>   |             |             |         |              |
| Rehabilitation | 30.4 (17.3) | 21.3 (9.8)  | 3.77    | .000         |
| Control        | 29.4 (21.0) | 20.2 (8.0)  | 1.71    | .053         |
| Drop-out       | 27.5 (14.2) | 15.2 (2.9)  | 2.50    | .028         |
| <b>DIS</b>     |             |             |         |              |
| Rehabilitation | 3.6 (3.4)   | 2.9 (3.4)   | 1.61    | .057         |
| Control        | 6.4 (3.8)   | 5.2 (3.5)   | 1.81    | .045         |
| Drop-out       | 6.4 (5.8)   | 4.3 (5.3)   | 0.97    | .180         |
| <b>UCL-P</b>   |             |             |         |              |
| Rehabilitation | 16.9 (3.5)  | 17.0 (3.9)  | -0.39   | .348         |
| Control        | 16.8 (3.0)  | 17.0 (3.5)  | -0.23   | .412         |
| Drop-out       | 18.0 (4.2)  | 16.6 (3.6)  | 2.50    | .024         |
| <b>SSIT-C</b>  |             |             |         |              |
| Rehabilitation | 47.6 (9.0)  | 52.9 (11.2) | -4.21   | .000         |
| Control        | 37.1 (15.5) | 40.8 (14.1) | -1.86   | .041         |
| Drop-out       | 44.4 (8.6)  | 47.4 (9.8)  | -0.64   | .278         |
| <b>SSIT-W</b>  |             |             |         |              |
| Rehabilitation | 0.61 (0.74) | 1.20 (1.32) | -3.04   | .002         |
| Control        | 0.24 (0.44) | 0.24 (0.57) | 0.00    | .500         |
| Drop-out       | 0.60 (0.89) | 0.60 (0.55) | 0.00    | .500         |
| <b>REHAB</b>   |             |             |         |              |
| Rehabilitation | 32.9 (21.5) | 24.0 (19.6) | 3.58    | .001         |
| Control        | 44.6 (20.0) | 40.1 (19.5) | 1.61    | .064         |
| Drop-out       | 50.2 (27.6) | 40.3 (31.9) | 1.28    | .168         |
| <b>POV</b>     |             |             |         |              |
| Rehabilitation | 22.2 (7.1)  | 15.2 (6.8)  | 7.24    | .000         |
| Control        | 26.2 (6.2)  | 25.1 (5.7)  | 0.98    | .171         |
| Drop-out       | 24.2 (7.3)  | 17.7 (10.9) | 2.43    | .021         |
| <b>REA</b>     |             |             |         |              |
| Rehabilitation | 3.5 (3.5)   | 1.9 (2.4)   | 4.37    | .000         |
| Control        | 6.2 (4.3)   | 4.6 (2.6)   | 2.50    | .012         |
| Drop-out       | 4.3 (3.3)   | 3.4 (3.3)   | 0.74    | .239         |

Table 8.5: X<sup>2</sup> results (rehabilitation, drop-out and control).

|  | Rehabilitation<br>cond.1 | Drop-out<br>cond.2a(2)                  | Control<br>cond.3 |
|--|--------------------------|---|-------------------|
| <b>Location<br/>(reference at T3)</b>        |                          |   |                   |
| Independent living                           | 14                       | 4                                       | 0                 |
| Family                                       | 4                        | 0                                       | 0                 |
| Sheltered accommodation                      | 28                       | 2                                       | 0                 |
| Long stay ward                               | 8                        | 3                                       | 17                |
| Outside                                      | 46                       | 6                                       | 0                 |
| Inside                                       | 8                        | 3                                       | 17                |
|  | 1 versus 2a+3:           | X <sup>2</sup> (1)=30.24, p < .000      |                   |
|  | 2a versus 3:             | X <sup>2</sup> (1)= 8.39, p < .005      |                   |
|  | 1 versus 2a:             | X <sup>2</sup> (1)= 2.68, n.s.          |                   |
| <b>Location<br/>(1 year follow-up)</b>       |                          |   |                   |
| Re-admission                                 | 2                        | 0 (3)                                   | 0                 |
| Outside                                      | 44                       | 6 (15)                                  | 1                 |
| Inside                                       | 10                       | 3 (9)                                   | 16                |
|  | 1 versus 2a+3:           | X <sup>2</sup> (1)=23.11, p < .000      |                   |
|  | 2 versus 3:              | X <sup>2</sup> (1)= 5.62, p < .05       |                   |
|  | 1 versus 2:              | X <sup>2</sup> (1)= 1.69, n.s.          |                   |
| <b>Daily activity<br/>(reference at T3)</b>  |                          |   |                   |
| Paid   | 1                        | 1                                       | 0                 |
| Unpaid                                       | 19                       | 2                                       | 0                 |
| Study  | 10                       | 0                                       | 0                 |
| Inside                                       | 15                       | 3                                       | 17                |
| None   | 9                        | 3                                       | 0                 |
| Outside                                      | 30                       | 3                                       | 0                 |
| Other  | 24                       | 6                                       | 17                |
|  | 1 versus 2a+3:           | X <sup>2</sup> (1)=12.27, p<.001        |                   |
|  | 2a versus 3:             | X <sup>2</sup> (1)= 3.56, n.s. (p=.059) |                   |
|  | 1 versus 2a:             | X <sup>2</sup> (1)= 0.77, n.s.          |                   |
| <b>Daily activity<br/>(1 year follow-up)</b> |                          |   |                   |
| Outside                                      | 33                       | 4                                       | 1                 |
| Other  | 21                       | 5                                       | 16                |
|  | 1 versus 2a+3:           | X <sup>2</sup> (1)=10.72, p<.001        |                   |
|  | 2a versus 3:             | X <sup>2</sup> (1)= 3.42, n.s. (p=.064) |                   |
|  | 1 versus 2a:             | X <sup>2</sup> (1)= 0.33, n.s.          |                   |

Drop-out cond.2 = all drop-outs (n=24)  
Drop-out cond.2a = drop-outs who completed both assessments (n=9)  
Location outside = independent living + family + sheltered accommodation  
Location inside = long stay ward  
Daily activity outside = payed + unpaid + study  
Daily activity other = inside + none

**Table 8.6: Disorganization items (T-tests; n=63).**

| item | T1 | T3 | T-value | Significance |
|------|----|----|---------|--------------|
|------|----|----|---------|--------------|



|   |           |           |      |      |
|---|-----------|-----------|------|------|
| s11: poverty of content of speech       | .67 (.10) | .40 (.75) | 2.48 | .008 |
| s27: social inattentiveness             | .76 (.76) | .67 (.88) | 0.74 | .233 |
| c11: discongruent emotions              | .84 (.57) | .62 (.73) | 2.23 | .015 |
| c12: diminished understanding of speech | .48 (.69) | .44 (.71) | 0.29 | .386 |
| c14: incoherent speech                  | .60 (.91) | .40 (.77) | 1.89 | .032 |
| c16: mannerisms                         | .27 (.65) | .27 (.60) | 0.00 | .500 |

#### 8.4.2 Results on problem-oriented coping.

Results on UCL-P do not reveal any main effects. This signifies that no differences are found between the conditions. Also the covariates do not explain a significant proportion of variance, and the mean score of the conditions on problem-oriented coping does not change between the first and third assessment. The interaction effect 'condition x moment' is not significant which implies that the conditions do not fluctuate in different directions between the first and third assessment.

The univariate results point out that the rehabilitation and control conditions remain unchanged. However, the drop-out condition has deteriorated. Problem-oriented coping is not positively affected by the programme and is not stable in the drop-out condition.

#### 8.4.3 Results on social skills.

Three main effects are found on SSIT-C and SSIT-W. There is a difference between the conditions and the regression is also significant. The main effect 'moment' is also significant which signifies that the scores have changed. Overall, the changes are in the same direction. Table 8.4 explains which conditions improve significantly on both SSIT-C and SSIT-W.

The univariate results demonstrate that competence of social skills and W-questions make progress in the rehabilitation condition. In the control condition, only competence shows improvement. Neither competence nor W-questions improve in the drop-out condition. Consequently, overall, social skills have improved in the rehabilitation condition and not in the control and drop-out condition. However, competence of social skills also shows improvement in the control condition. Only the improvement on SSIT-W can be attributed to participating in the programme for more than 75%.

#### 8.4.4 Results on general functioning.

Two main effects are found on general functioning. Firstly, the regression on the covariates is significant. A large proportion of variance can be explained by the effects of age and duration of illness. Secondly, the main effect 'moment' is significant which signifies a change in general functioning. The main effect 'condition' and the interaction effect 'condition x moment' are not significant. Thus, general functioning has changed in

the same direction in every condition. To verify which conditions and variables have improved significantly, results on the one-tailed T-tests are inspected (table 8.4).

The rehabilitation condition shows improvement on both measures. The control condition does not significantly improve on any measure. In the drop-out condition the poverty syndrome improves. Consequently, general functioning has improved after participating in the rehabilitation programme. However, compared to the rehabilitation condition, at the first assessment, age is higher and duration of illness is longer in the control condition. Thus, improvement cannot be attributed only to participating in the rehabilitation programme.

#### 8.4.5 Results on reality distortion.

In table 8.3 two main effects on reality distortion are reported. Firstly, the 'condition' effect represents a stable and significant difference between the conditions. Secondly, the 'moment' effect represents a change in all conditions. Since there is no interaction effect, the change is in the same direction for all conditions. So, reality distortion does not improve more in the rehabilitation condition.

To check how the conditions differ and which conditions have improved significantly, one-tailed T-tests are performed (table 8.4).

Reality distortion is higher in the control condition compared to the rehabilitation condition. However, both conditions improve. The drop-out condition does not improve.

To check which reality distortion items did not change during the programme, the items constituting this measure are tested with one tailed T-tests. The first assessment is compared to the third assessment for the drop out condition (n=9) and the rehabilitation condition (n=54) (table 8.7).

'Feeling controlled' and 'commenting voices' show the least improvement during the programme. In the drop-out condition these items are stable (c3 and c8: T-value = .00, Significance = .50).

Table 8.7: Reality distortion items (T-tests: n=63).

| item                              | T1        | T3        | T-value | Significance |
|-----------------------------------|-----------|-----------|---------|--------------|
| c3: feeling controlled            | .35 (.70) | .22 (.52) | 1.47    | .073         |
| c4: disrupted thoughts            | .89 (.94) | .51 (.78) | 3.27    | .001         |
| c5: ideas of persecution          | .60 (.73) | .24 (.47) | 3.88    | .000         |
| c8: commenting voices             | .70 (1.0) | .51 (.90) | 1.45    | .072         |
| c9: other auditory hallucinations | .59 (1.0) | .30 (.66) | 2.50    | .008         |
| c10: other hallucinations         | .46 (.88) | .25 (.28) | 1.86    | .034         |

#### 8.4.6 Results on accommodation.

After the programme, patients have been referred to different locations: independent housing facilities, living with their family, sheltered accommodation outside the clinic, or long stay wards. In table 8.5 the results are presented for each condition.

At the third assessment, 46 patients (85.2%) who participated in the rehabilitation programme were referred to housing facilities outside the clinic. Six patients of the drop-out condition and none of the control patients were referred to a housing facility outside the clinic.

Being referred to a residence outside the clinic, did not imply patients could leave the hospital directly after the programme. In 23 cases patients had to wait at the outflow department until the intended accommodation was available.

The dependency between condition and accommodation (inside or outside the hospital) is analyzed with the Chi-Square ( $X^2$ ) test for association. Results are presented in table 8.5.

At the third assessment, being referred to residences outside the clinic is dependent upon the condition. More patients who have participated in the rehabilitation programme are referred to housing facilities outside the clinic, compared to patients who participated in the control and drop-out conditions. Also, more patients who dropped out of the study are referred to housing facilities outside the clinic compared to patients who participated in the control condition. Comparing drop-outs to the rehabilitation condition, the result is not significant ( $X^2_{(1)} = 2.68$ , n.s.). Consequently, it is concluded that participating in the rehabilitation for less than 75%, also leads to a higher chance of referral to a facility outside the clinic. Being referred to an accommodation outside the clinic is possibly related to the general attitude of professionals during the programme. Regardless the percentage of participation, all patients were helped to obtain their goals.

Concerning the rehabilitation patients, at the fourth assessment, six months after the programme, seventeen patients (31%) live independently, four patients (7%) live with their family, eighteen (33%) have sheltered accommodation outside the clinic, seven (13%) have been referred to a long-stay ward, and none of the patients discharged after the programme have been re-admitted to the hospital. Eight patients (15%) are still waiting for suitable accommodation at the outflow department.

At the one year follow up, results for all drop-outs ( $n=24$ ; condition 2a) could be established. In the 'drop out column' these results are presented in parenthesis (table 8.5).

One year after the programme, 10 patients (19%) are hospitalized. So, 81% of patients are living outside the clinic.

All patients have left the outflow department. Seven patients who were referred to sheltered accommodation did not stay there. Three patients have moved to independent housing facilities, two patients who were referred to sheltered accommodation but had to wait at the outflow department have gone back to their families. One patient has been re-admitted to a long stay ward, and one patient was re-admitted to an admission department. So, overall, after their referral to accommodation outside the clinic, two of the patients, have been re-hospitalized at the one year follow up. This means that the re-admission rate is 4.3%. As a result, 95.7% of patients referred to accommodation outside the clinic, have not been hospitalized again at the one year follow up.

Comparing the rehabilitation patients to the drop-out and control condition, at the one year follow up, accommodation is significantly related to condition ( $X^2_{(1)} = 23.01$ ,

$p < .000$ ). Comparing the rehabilitation condition to all drop-outs ( $n=24$ ), at the one year follow up no significant association can be found ( $X^2(1) = 1.69$ , n.s.). The association is significant if drop-outs are compared to the control condition ( $X^2(1) = 5.62$ ,  $p < .05$ ).

#### 8.4.7 Results on daily activities.

During the second stage of the programme and after the programme, patients are referred to different 'jobs': paid employment or unpaid but regular employment outside the clinic, regular and official study activities, regular daily activities inside the clinic and no regular daily activity at all. In table 8.5 the results are presented for every condition.

At the third assessment, 30 patients (55.6%) who participated in the rehabilitation programme are referred to activities outside the clinic. Three patients of the drop-out condition and none of the control patients participate in activities outside the clinic. Results of the Chi-Square ( $X^2$ ) tests show that at the third assessment, being referred to daily activities outside the clinic is dependent upon the condition. More patients who participate in the rehabilitation programme 'work' outside the clinic compared to patients who participate in the control and drop-out conditions. Comparing the drop-out to the rehabilitation condition, the result is not significant ( $X^2(1) = 0.77$ , n.s.). Consequently, just as for accommodation, it is concluded that participating in the rehabilitation programme for less than 75%, also leads to a higher chance of referral to daily activities outside the clinic. So, being referred to activities outside the clinic is probably a matter of professional attitude as well.

The results at third assessment stabilize until one year after the programme. At the one year follow up, more patients who participated in the rehabilitation programme 'work' outside the clinic compared to the drop-out and control condition ( $X^2(1) = 10.72$ ,  $p < .001$ ). Comparing the drop-out to the rehabilitation condition, the result is not significant ( $X^2(1) = 3.42$ , n.s.).

#### 8.4.8 Conclusion.

In table 8.8 the results of the third testing are summarized. After eight months of training in the rehabilitation condition, significant improvement is found in: proceduralization (HANOI), competence of social skills (SSIT-C), asking W-questions as a reaction to social prompts (SSIT-W), general behaviour (REHAB), the psychomotor poverty syndrome (POV), and reality distortion (REA). Proceduralization and psychomotor poverty also improve in the drop-out condition. Reality distortion also improves in the control condition. Consequently, hypothesis 1 is rejected; patients who participate in the rehabilitation condition do not improve more on every outcome category compared to patients who drop out of the programme or participate in a traditional long stay ward programme. However, asking W-questions as a reaction to social prompts (SSIT-W) and general behaviour (REHAB) only improve in the rehabilitation condition. With regard to general behaviour, this result cannot be explained only by participating in the rehabilitation programme more than 75%.

Does the fact that only improvement on SSIT-W can be attributed to participating

in the programme more than 75%, mean that applying a rehabilitation programme to schizophrenic patients is useless? No, after the programme 85% of the patients have been referred to an accommodation outside the clinic and 56% of the patients have been referred to 'working situations' outside the clinic. At the one year follow up, 81% of patients live outside the clinic. Only 4% of patients is re-admitted to the hospital and 61% of patients 'work' outside the clinic. As to accommodation and working situation, the results are significantly better in comparison with the control condition but not compared to the drop-out condition. Apparently, it is not the training perse that enables patients to live outside the hospital. Also, improved functioning does not directly lead to discharge from the hospital. In that case, control patients would have also left the hospital. It appears that the general professional attitude and strategies to prevent hospitalization and to dismiss patients to housing facilities and working situations outside the hospital are the key issues that lead to success.

**Table 8.8: Summary of the results of the third testing.**

| Category                | Variables              | Result                                  | Condition |     |    |
|-------------------------|------------------------|---|-----------|-----|----|
|                         |                        |   | 1.        | 2a. | 3. |
| Cognitive Organization  |                        | Conditions change in the same direction |           |     |    |
|                         | DIGITS                 |   | -         | -   | -  |
|                         | HANOI                  |   | +         | +   | -  |
|                         | DIS                    |   | -         | -   | +  |
| Problem Oriented Coping | UCL-P                  | No change                               | -         | -   | -  |
| Social Skills           |                        | Conditions change in the same direction |           |     |    |
|                         | SSIT-C                 |   | +         | -   | +  |
|                         | SSIT-W                 |   | +         | -   | -  |
| General Functioning     |                        | Conditions change in the same direction |           |     |    |
|                         | REHAB                  |   | +         | -   | -  |
|                         | POV                    |   | +         | +   | -  |
| Reality Distortion      | REA                    | Conditions change in the same direction | +         | -   | +  |
| Accommodation           | % Outside the hospital |   | 85        | 0   | 50 |
| Daily Activities        | % Outside the hospital |   | 56        | 0   | 50 |

1 = Rehabilitation condition  
2a = Drop-out2 (drop-outs who completed both assessments)  
3 = Control

- = no improvement (univariate)
- + = improvement (univariate)

Because reference to housing facilities and working situations has not been controlled for by age and duration of illness, it can not be concluded that traditional long stay ward programmes do not lead to discharge from the hospital. However, after eight months, none of the control subjects (including six patients who are younger than 33) was referred to an accommodation or working situation outside the hospital. Therefore, it seems reasonable to assume that at least some of the control patients would have been able to leave the hospital if they would have participated in the rehabilitation programme. Thus, the programme in general, but specifically the professional reinforcement of residual abilities, seems to be a successful strategy to prevent long term hospitalization in schizophrenia.

During the programme, the patients' functioning improves. However, the reproduction of declarative information (DIGITS), cognitive disorganization and problem-oriented coping (UCL-P) do not change. With regard to disorganization, especially the aspects of social inattentiveness, diminished understanding of speech, and mannerisms are not positively affected. Although reality distortion improves, feeling controlled and commenting voices do not diminish during the programme. In section 8.3 it was concluded that patients with profound disorganization and very poor competence on general behaviour do not seem to be able to participate in the programme. Thus, in general, the programme does not lead to the development of problem-oriented coping and does not contribute to reduced profound cognitive disorganization and severe psychotic symptoms. In the next section the questions are whether these results count for both conditions of the programme and whether the results maintain until the six and twelve months follow-up.

### 8.5 The additional value of cognitive skills training.

In this section, the additional value is determined of the cognitive skills training condition on cognitive organization (DIGITS, HANOI and DIS), coping (UCL-P), social skills (SSIT-C and SSIT-W), general functioning (REHAB and POV), psychotic symptoms (REA), accommodation and daily activities. Furthermore, the results of the first and second follow-up are presented.

A comparison is made between subjects who have participated in the cognitive skills training condition (n=27; condition 1a) and in the standard condition of the programme (n=27; condition 1b).

For every category (except accommodation and daily activities) the different assessments are compared using multivariate analysis of variance with repeated measures and age and prior admissions as covariates. With regard to the analyses on DIGITS and SSIT-C, the level of education is included as a covariate. Concerning the analyses on SSIT-C and REHAB, duration of illness is also included as a covariate. The DIGITS, HANOI, and UCL-P have been administered until the six months follow up. The REHAB, POV, DIS, and REA have been administered until the one year follow up. The SSIT-C and SSIT-W have been administered up to the third testing. For each category the relevant amount of assessments will be included in the analyses. The results on accommodation and daily activities are calculated using crosstabs and the Chi-square ( $X^2$ ) test for association. In table 8.9 and 8.10, the results are presented.

Comparing the conditions, no condition effect is found on cognitive organization, problem-oriented coping, social skills, general functioning and reality distortion. In addition, the conditions are unrelated to accommodation and daily activities at the third and fifth assessment. As a result, no stable and significant differences are found between the cognitive skills training condition and the standard condition of the programme.

The regression on social skills and general functioning is significant. Concerning social skills, especially the level of education produces a significant effect on the outcome (T-value= -2.62,  $p < .05$ ). Prior admissions accounts for the effect on general functioning (T-value= 2.18,  $p < .05$ ).

On each category, except problem-oriented coping, a moment effect is found. For problem-oriented coping, the interaction effects is significant. Apparently, fluctuations in problem-oriented coping are not the same in both conditions.

To find out whether the performances improve in both conditions, the first and final scores are compared with one-tailed T-tests for every variable. The results are presented in table 8.11.

With regard to all subjects (condition 1a+1b), besides problem-oriented coping, all variables improve significantly between the first and final assessment. In the standard condition all variables improve significantly. Although in the cognitive skills training condition, besides UCL-P, all variables improve, the change is not significant with regard to DIGITS, SSIT-W and REHAB. In this condition problem oriented coping deteriorates significantly between first and final assessment. The mean score on problem-oriented coping amounts to 17.4 at the first assessment, and 17.3, 17.1 and 16.4 at the second, third and fourth assessment respectively. In the standard conditions the mean scores are 16.3, 16.3, 17.0 and 17.6. Thus, in the cognitive skills training condition, the problem-oriented coping score deteriorates during the second stage of the programme and during the first six months after the programme. In the standard condition the score improves at the third and fourth assessment.

Compared to the results of the third testing, as presented in the previous section, the results of the final testing (condition 1a+1b) also show improvement in reproduction of declarative information and cognitive disorganization. To determine whether all items that constitute disorganization have improved at the one year follow up, the results are tested with one-tailed T-tests for every item (table 8.12).

Just as at the third assessment, social inattentiveness and mannerisms do not improve significantly. However, diminished understanding of speech does improve at the one year follow-up.

With regard to reality distortion, the items are also inspected at the one year follow-up (table 8.13).

Although feeling controlled and commenting voices do not diminish during the programme (table 8.7), at the one year follow-up these items show improvement. However, ideas of persecution do not improve compared to the first assessment. As a consequence, delusional (paranoid) ideas, reoccur after termination of the programme.

### 8.5.1 Conclusion.

With regard to cognitive organization, problem-oriented coping, social skills,

general functioning, reality distortion, accommodation and daily activities, the individual cognitive skills training does not have additional value to the standard condition of the rehabilitation programme. With regard to the variables that constitute the categories, the univariate results show that some variables (DIGITS, UCL-P, SSIT-W and REHAB) do improve significantly in the standard condition of the programme but not in the cognitive skills training condition.

In correspondence with the findings of Hodel (1993) these results strongly oppose the opinion that cognitive disturbances have a pervasive character. In other words, aiming at the prevention of long term hospitalization it does not seem to be necessary to train disturbed information processing individually. Psycho-education and the training of survival skills that employ a methodology which takes into account the presence of cognitive disturbances, is sufficient to prepare about 80% of patients to live outside the hospital.

Some variables that do not improve after the programme, do show improvement at the one year follow-up. However, social inattentiveness, mannerisms and delusional thinking do not improve. Apparently these symptoms need specific attention in the rehabilitation process of schizophrenic patients.



Table 8.9: MANCOVA results (condition 1a and 1b).

| Category<br>(variable(s))                              | Sum of<br>Squares | Df | F-value | Significance<br>of F. |
|--|-------------------|----|---------|-----------------------|
| <b>Cognitive organization<br/>(DIGITS, HANOI, DIS)</b> |                   |    |         |                       |
| Condition  | 92.66             | 1  | 1.06    | .309                  |
| Regression   | 255.66            | 3  | 1.46    | .242                  |
| Moment   | 1550.56           | 4  | 14.60   | .000                  |
| Condition x Moment                                     | 87.55             | 3  | 0.82    | .484                  |
| <b>Coping<br/>(UCL-P)</b>                              |                   |    |         |                       |
| Condition  | 1.20              | 1  | 0.03    | .865                  |
| Regression   | 54.72             | 2  | 0.67    | .516                  |
| Moment   | 1.79              | 3  | 0.13    | .942                  |
| Condition x Moment                                     | 42.83             | 3  | 3.09    | .029                  |
| <b>Social skills<br/>(SSIT-C, SSIT-W)</b>              |                   |    |         |                       |
| Condition  | 10.38             | 1  | 0.11    | .742                  |
| Regression   | 1250.56           | 4  | 3.29    | .018                  |
| Moment   | 497.45            | 2  | 9.47    | .000                  |
| Condition x Moment                                     | 23.34             | 2  | 0.44    | .642                  |
| <b>General functioning<br/>(REHAB, POV)</b>            |                   |    |         |                       |
| Condition  | 343.54            | 1  | 0.45    | .504                  |
| Regression   | 9777.20           | 3  | 4.30    | .009                  |
| Moment   | 5609.23           | 4  | 10.27   | .000                  |
| Condition x Moment                                     | 167.23            | 4  | 0.31    | .874                  |
| <b>Reality distortion<br/>(REA)</b>                    |                   |    |         |                       |
| Condition  | 35.46             | 1  | 1.70    | .199                  |
| Regression   | 3.40              | 2  | 0.08    | .922                  |
| Moment   | 108.98            | 4  | 9.37    | .000                  |
| Condition x Moment                                     | 16.19             | 4  | 1.39    | .238                  |

Table 8.10: X<sup>2</sup> results (condition 1a and 1b).

|                                      | Condition 1a  | Condition 1b  |
|--------------------------------------|---------------|---|
| <hr/>                                |               |   |
| Location<br>(reference at T3)        |               |   |
| Independent housing facility         | 7             | 7   |
| Family                               | 2             | 2   |
| Sheltered accommodation              | 15            | 13  |
| Long stay ward                       | 3             | 5   |
| Outside                              | 24            | 22  |
| Inside                               | 3             | 5   |
|                                      | 1a versus 1b: | X <sup>2</sup> (1)=0.15, n.s.                         |
| <br>                                 |               |   |
| Location<br>(1 year follow-up)       |               |   |
| Re-admission                         | 0             | 1   |
| Outside                              | 24            | 20  |
| Inside                               | 3             | 7   |
|                                      | 1a versus 1b: | X <sup>2</sup> (1)=1.10, n.s.                         |
| <hr/>                                |               |   |
| Daily activity<br>(reference at T3)  |               |   |
| Paid                                 | 1             | 0   |
| Unpaid                               | 11            | 8   |
| Study                                | 6             | 4   |
| Inside                               | 4             | 11  |
| None                                 | 5             | 4   |
| Outside                              | 18            | 12  |
| Other                                | 9             | 15  |
|                                      | 1a versus 1b: | X <sup>2</sup> (1)=1.88, n.s.                         |
| <br>                                 |               |   |
| Daily activity<br>(1 year follow-up) |               |   |
| Outside                              | 19            | 14  |
| Other                                | 8             | 13  |
|                                      | 1a versus 1b: | X <sup>2</sup> (1)=1.25, n.s.                         |
| <hr/>                                |               |   |
| Condition 1a                         | =             | cognitive skills training (n=27)                      |
| Condition 1b                         | =             | standard (n=27)                                       |
| Location outside                     | =             | independent living + family + sheltered accommodation |
| Location inside                      | =             | long stay ward  |
| Daily activity outside               | =             | payed + unpaid + study                                |
| Daily activity other                 | =             | inside + none   |

**Table 8.11: First and final assessment (T-tests).**

| Variable     | Condition | T1                               | Final assessment | T-value | Significance |
|--------------|-----------|----------------------------------|------------------|---------|--------------|
| DIGITS       | 1a        | 10.9 (2.6)                       | T4: 11.6 (3.5)   | -1.18   | .124         |
|              | 1b        | 11.3 (3.8)                       | T4: 12.6 (4.5)   | -2.68   | .006         |
|              | 1a+1b     | 11.1 (3.2)                       | T4: 12.1 (4.0)   | -2.62   | .006         |
| HANOI        | 1a        | 29.5 (16.7)                      | T4: 20.0 (6.1)   | 3.19    | .002         |
|              | 1b        | 31.3 (18.1)                      | T4: 17.7 (4.5)   | 3.83    | .000         |
|              | 1a+1b     | 30.4 (17.3)                      | T4: 18.9 (5.4)   | 4.99    | .000         |
| DIS          | 1a        | 2.6 (2.9)                        | T5: 1.4 (1.5)    | 2.11    | .022         |
|              | 1b        | 4.7 (3.7)                        | T5: 2.7 (3.1)    | 2.64    | .007         |
|              | 1a+1b     | 3.7 (3.4)                        | T5: 2.1 (2.6)    | 3.02    | .002         |
| UCL-P        | 1a        | 17.4 (3.4)                       | T4: 16.4 (4.2)   | 1.61    | .006         |
|              | 1b        | 16.3 (3.6)                       | T4: 17.6 (3.6)   | -2.55   | .009         |
|              | 1a+1b     | 16.9 (3.5)                       | T4: 17.0 (3.9)   | -0.31   | .380         |
| SSIT-C       | 1a        | 46.8 (9.7)                       | T3: 53.7 (10.8)  | -3.38   | .001         |
|              | 1b        | 48.3 (8.2)                       | T3: 52.1 (11.7)  | -2.53   | .009         |
|              | 1a+1b     | 47.6 (9.0)                       | T3: 52.9 (11.2)  | -4.21   | .000         |
| SSIT-W       | 1a        | 0.67 (0.78)                      | T3: 1.04 (1.29)  | -1.24   | .113         |
|              | 1b        | 0.56 (0.70)                      | T3: 1.37 (1.36)  | -3.25   | .002         |
|              | 1a+1b     | 0.61 (0.74)                      | T3: 1.20 (1.32)  | -3.04   | .002         |
| REHAB        | 1a        | 28.7 (18.2)                      | T5: 25.9 (22.6)  | 0.64    | .265         |
|              | 1b        | 37.1 (24.0)                      | T5: 26.4 (23.1)  | 2.42    | .011         |
|              | 1a+1b     | 32.9 (21.5)                      | T5: 26.2 (22.7)  | 2.15    | .018         |
| POV          | 1a        | 21.6 (7.2)                       | T5: 12.1 (5.5)   | 5.43    | .000         |
|              | 1b        | 22.7 (7.1)                       | T5: 13.0 (8.0)   | 7.19    | .000         |
|              | 1a+1b     | 22.2 (7.1)                       | T5: 12.5 (6.8)   | 8.76    | .000         |
| REA          | 1a        | 2.5 (2.3)                        | T5: 1.4 (1.8)    | 2.62    | .007         |
|              | 1b        | 4.4 (4.3)                        | T5: 2.3 (3.0)    | 2.93    | .004         |
|              | 1a+1b     | 3.5 (3.5)                        | T5: 1.9 (2.5)    | 3.73    | .000         |
| Condition 1a | =         | cognitive skills training (n=27) |                  |         |              |
| Condition 1b | =         | standard (n=27)                  |                  |         |              |

**Table 8.12: Disorganization items (T-tests; n=54).**

| item                                    | T1        | T5        | T-value | Significance |
|---|-----------|-----------|---------|--------------|
| s11: poverty of content of speech       | .53 (.88) | .31 (.58) | 1.97    | .028         |
| s27: social inattentiveness             | .69 (.71) | .49 (.64) | 1.43    | .080         |
| c11: incongruent emotions               | .80 (.57) | .39 (.60) | 3.77    | .000         |
| c12: diminished understanding of speech | .41 (.67) | .18 (.43) | 2.47    | .009         |
| c14: incoherent speech                  | .45 (.76) | .27 (.53) | 1.70    | .048         |
| c16: mannerisms                         | .20 (.53) | .14 (.49) | 1.00    | .161         |

**Table 8.13: Reality distortion items (T-tests; n=54).**

| item                              | T1        | T5        | T-value | Significance |
|-----------------------------------|-----------|-----------|---------|--------------|
| c3: feeling controlled            | .33 (.65) | .10 (.36) | 2.87    | .003         |
| c4: disrupted thoughts            | .84 (.93) | .49 (.87) | 2.70    | .005         |
| c5: ideas of persecution          | .57 (.76) | .53 (.78) | 0.26    | .398         |
| c8: commenting voices             | .61 (.96) | .35 (.74) | 1.79    | .040         |
| c9: other auditory hallucinations | .45 (.88) | .18 (.52) | 2.24    | .015         |
| c10: other hallucinations         | .47 (.88) | .21 (.58) | 2.15    | .018         |

## 8.6 Predictors of successful rehabilitation.

### 8.6.1 Stability of CPT-d'.

In section 7.5.3. it is assumed that patients who are unable to process information do not profit from the programme. Considering that the CPT-d' score presumably represent a stable vulnerability indicator of schizophrenia, related to the prediction of success, two hypotheses are formulated on this measure of response variability. The first hypothesis is:

Hypothesis 2a: CPT-d' score does not change as a result of the programme.

In both rehabilitation conditions, CPT-d' is administered until the fourth testing. Thus, the interval between the first and final assessment is 14 months. Hypothesis 2a is tested using multivariate analysis of variance with repeated measures (T1, T2, T3, and T4). No covariates are included in this analysis. In table 8.14 the results are presented.

**Table 8.14: Stability of CPT-d' (MANOVA: condition 1a and 1b).**

| Variable                      | Sum of Squares | Df | F-value | Significance of F. |
|-------------------------------|----------------|----|---------|--------------------|
| Response variability (CPT-d') |                |    |         |                    |
| Constant                      | 1804.22        | 1  | 557.15  | .000               |
| Moment                        | 1.30           | 3  | 1.17    | .322               |

The moment effect is not significant. Overall, CPT-d' score did not change until fourteen months after the first assessment. So, hypothesis 2a is accepted; CPT-d' score does not change as a result of the programme.

The second hypotheses on CPT-d' presumes that this score will successfully predict the outcome of the programme. In the next section all the first assessment scores will be used to establish predictive variables.

### 8.6.2 Predicting improvement.

According to the procedure as described in section 7.6, the change between two assessments in each variable is expressed as a proportion of the standard deviation of all observations. The adjusted improvement score in each variable is calculated for every subject as to the first stage (T1-T2), the second stage (T2-T3) and the programme (T1-T3). To select variables for multiple regression analysis, the correlations between the adjusted improvement scores and the first and second assessment scores are inspected. In tables 8.15, 8.16 and 8.17 the correlations are presented. Adjusted improvement scores referring to the first and second stage are marked with respectively 'S1' (table 8.15) and 'S2' (table 8.16). Improvement scores referring to the programme are marked with 'P-' (table 8.17). Significant correlations ( $p < .01$ ) are printed in boldface.

The results show, that in most cases improvement on a particular variable is only significantly related to the first or the second assessment score on that variable itself. Only two exceptions are found. Firstly, during the first stage improvement on proceduralization (S1HANOI) is significantly related to proceduralization at first assessment (HANOI1) and to information processing (CPT-d1). Secondly, during the programme improvement on reality distortion (P-REA) is related to reality distortion at first assessment (REA1) and to reproduction of declarative information at first assessment (DIGITS1).

The prediction of improvement on proceduralization (HANOI) during the first stage and on reality distortion (REA) during the programme are calculated with stepwise multiple regression analyses. With regard to proceduralization the dependent variable is S1HANOI and the independent variables are HANOI1 and CPT-d1. Regarding reality distortion the dependent variable is P-REA and the independent variables are REA1 and DIGITS1. The results are presented in table 8.18 and 8.19.

During the first stage, 66% of the improvement on proceduralization (HANOI) is explained by the HANOI-score at the first assessment. Information processing (CPT-d1) does not explain variance of this improvement. During the programme, 53% of the improvement on reality distortion (REA) is explained by the REA-score at the first assessment. The DIGITS-score at the first assessment adds 4% of explained variance of improvement on reality distortion.

To find out whether the reference at third assessment with regard to status of accommodation and daily activities can be predicted at first assessment, the subjects are divided into two groups on both variables. The first group includes patients who are referred to housing facilities (n=46) or working situations (n=30) outside the clinic, the second group includes patients who stay inside the hospital (n=8) or have daily activities inside the hospital, or no activities at all (n=24)(see table 8.5). For both 'accommodation' and 'daily activities' with oneway analysis of variance, first assessment scores of both groups are compared. The results on accommodation are presented in table 8.20 and the results on daily activities in table 8.21.

The results show that at the first assessment general behaviour (REHAB) and disorganization (DIS) differentiate patients who after the programme are discharged from the hospital or referred to working situations outside the hospital from patients who stay/work in the hospital or have no activities at all.

With regard to accommodation, patients who stay in the hospital (n=8) have higher disorganization score (mean: 6.4; standard deviation: 3.4) and poor general

behaviour (mean: 47.0; standard deviation: 22.2) as compared to patients who leave the hospital (n=46;

**Table 8.15: 1st assessment scores and Improvement during the 1st stage (correlations).**

|          | AGE    | LEVEL OF EDUCATION | DURATION OF ILLNESS | PRIOR ADMISSIONS |        |      |      |
|----------|--------|--------------------|---------------------|------------------|--------|------|------|
| S1DIGITS | .16    | .07                | -.02                | -.03             |        |      |      |
| S1HANOI  | .09    | -.11               | .33                 | .12              |        |      |      |
| S1DIS    | -.04   | .21                | -.19                | -.27             |        |      |      |
| S1CPT-d  | .17    | -.08               | .05                 | -.11             |        |      |      |
| S1UCL-P  |        | .28                | -.08                |                  | .32    |      | .11  |
| S1REHAB  | -.08   | -.24               | -.06                | -.05             |        |      |      |
| S1POV    | .00    | .18                | -.06                | .21              |        |      |      |
| S1SSIT-C |        | -.02               | .06                 | -.07             | -.07   |      | -.08 |
| S1SSIT-W | .01    | -.12               | -.07                | -.05             |        |      |      |
| S1REA    | -.05   | -.01               | .05                 | .25              |        |      |      |
|          | CPT-d1 | WCST-P1            |                     | DIGITS1          | HANOI1 | DIS1 |      |
| S1DIGITS | .15    | -.14               | -.08                | -.09             |        | .05  |      |
| S1HANOI  | -.37*  | .14                | -.09                | .79**            |        | .17  |      |
| S1DIS    | -.03   | -.06               | -.02                | .03              |        | .44* |      |
| S1CPT-d' | -.57** | .19                | -.26                | .21              |        | .23  |      |
| S1UCL-P  | -.21   | .18                | -.06                | .14              |        | -.09 |      |
| S1REHAB  | -.17   | .08                | -.27                | -.04             |        | .07  |      |
| S1POV    | -.01   | .02                | .05                 | .08              |        | .05  |      |
| S1SSIT-C |        | -.31               | -.15                | -.23             |        | .12  |      |
| S1SSIT-W | .09    | -.01               | -.19                | .17              | .30    | -.13 |      |
| S1REA    | .20    | .02                | .20                 | -.10             |        | .08  |      |
|          | UCL-P1 | REHAB1             | SSIT-C1             | SSIT-W1          |        |      |      |
| S1DIGITS | -.15   | -.11               | .12                 | .17              |        |      |      |
| S1HANOI  | .03    | .35                | -.21                | -.08             |        |      |      |
| S1DIS    | -.11   | .04                | .04                 | .21              |        |      |      |
| S1CPT-d  | -.21   | .32                | .01                 | .10              |        |      |      |
| S1UCL-P  | -.42*  | .37*               | .01                 | .10              |        |      |      |
| S1REHAB  | -.11   | .44*               | .03                 | .09              |        |      |      |
| S1POV    | .01    | -.07               | .12                 | .20              |        |      |      |
| S1SSIT-C |        | .15                | .19                 | -.49**           |        | -.22 |      |
| S1SSIT-W | .05    | -.12               | .07                 | -.63**           |        |      |      |
| S1REA    | .05    | -.02               | .03                 | .22              |        |      |      |
|          | POV1   | REA1               |                     |                  |        |      |      |
| S1DIGITS | .01    | -.08               |                     |                  |        |      |      |
| S1HANOI  | -.02   | .02                |                     |                  |        |      |      |
| S1DIS    | .18    | -.03               |                     |                  |        |      |      |
| S1CPT-d  | .21    | .02                |                     |                  |        |      |      |
| S1UCL-P  | .05    | .02                |                     |                  |        |      |      |
| S1REHAB  | .03    | -.16               |                     |                  |        |      |      |
| S1POV    | .49**  | -.04               |                     |                  |        |      |      |
| S1SSIT-C |        | -.05               | -.30                |                  |        |      |      |
| S1SSIT-W | .10    | -.23               |                     |                  |        |      |      |
| S1REA    | -.07   | .69**              |                     |                  |        |      |      |

N of cases: 54      2-tailed Signif: \* - .01    \*\* - .001

Table 8.16: 2nd assessment scores and Improvement during the 2nd stage (correlations).

|          |        |         |         |         |      |  |       |
|----------|--------|---------|---------|---------|------|--|-------|
|          | CPTD2  | DIGITS2 | HANOI2  | DIS2    |      |  |       |
| S2DIGITS | -.11   | -.42*   | -.01    | -.13    |      |  |       |
| S2HANOI  | .08    | .11     | .60**   | -.26    |      |  |       |
| S2DIS    | -.33   | -.26    | .19     | .48**   |      |  |       |
| S2CPT-d  | -.28   | -.02    | -.09    | -.00    |      |  |       |
| S2UCL-P  | -.05   | -.20    | .26     | .12     |      |  |       |
| S2REHAB  | .02    | .14     | .21     | -.17    |      |  |       |
| S2POV    | .12    | -.26    | .03     | .04     |      |  |       |
| S2SSIT-C |        | .28     | .21     |         | -.02 |  | -.17  |
| S2SSIT-W | .20    |         | .12     | -.01    |      |  | -.03  |
| S2REA    | -.23   |         | .19     | -.04    |      |  | .18   |
|          | UCL-P2 | REHAB2  | SSIT-C2 | SSIT-W2 |      |  |       |
| S2DIGITS | -.15   | .06     | .06     | .01     |      |  |       |
| S2HANOI  | -.06   | .11     | .09     | .09     |      |  |       |
| S2DIS    | .01    | .14     | -.20    | -.35    |      |  |       |
| S2CPT-d  | .05    | .09     | -.08    | -.09    |      |  |       |
| S2UCL-P  | -.21   | .09     | .20     | .12     |      |  |       |
| S2REHAB  | -.02   | .55**   | .08     | .13     |      |  |       |
| S2POV    | -.14   | .04     | .06     | .19     |      |  |       |
| S2SSIT-C |        | -.15    | -.15    |         | -.31 |  | -.23  |
| S2SSIT-W | -.05   |         | -.08    | -.06    |      |  | -.38* |
| S2REA    | -.10   |         | .19     | -.30    |      |  | -.11  |
|          | POV2   | REA2    |         |         |      |  |       |
| S2DIGITS | .18    | .26     |         |         |      |  |       |
| S2HANOI  | .07    | -.07    |         |         |      |  |       |
| S2DIS    | .17    | .22     |         |         |      |  |       |
| S2CPT-d  | .16    | .40*    |         |         |      |  |       |
| S2UCL-P  | .00    | -.03    |         |         |      |  |       |
| S2REHAB  | -.10   | -.11    |         |         |      |  |       |
| S2POV    | .70**  | .25     |         |         |      |  |       |
| S2SSIT-C |        | -.02    | .37*    |         |      |  |       |
| S2SSIT-W | -.06   | .22     |         |         |      |  |       |
| S2REA    | .29    | .47**   |         |         |      |  |       |

N of cases: 54      2-tailed Signif: \* - .01    \*\* - .001

disorganization: 3.2 (3.3); general behaviour: 30.5 (20.7). However, because the standard deviations are high, it can only be concluded that very high disorganization score (> 10) and very poor general behaviour (> 70) at first assessment, seems to predict that a patient will stay in the hospital after the programme. The same holds for daily activities. Patients who after the programme have no activities or work inside the hospital (n=24) have higher disorganization score (mean: 4.9; standard deviation: 3.9) and poor general behaviour (mean: 39.3; standard deviation: 21.6) as compared to patients who work outside the hospital (n=30; disorganization:

2.6 (2.7); general behaviour: 27.8 (20.4). Again, the standard deviations are high. Thus, it can only be concluded that very high disorganization score (> 9) and very poor general behaviour (> 60) at first assessment, seems to predict that a patient will not be able to work

outside the hospital after the programme.

**Table 8.17: 1st assessment scores and Improvement during the programme (correlations).**

|          | AGE    |      | LEVEL OF EDUCATION |      | DURATION OF ILLNESS |         | PRIOR ADMISSIONS |         |       |
|----------|--------|------|--------------------|------|---------------------|---------|------------------|---------|-------|
| P-DIGIT  | .19    |      | .14                |      | -.03                |         | -.06             |         |       |
| P-HANOI  |        | -.01 |                    | -.13 |                     | .23     |                  | -.16    |       |
| P-DIS    | -.08   |      | .08                |      | -.08                |         | -.32             |         |       |
| P-CPT-d  | -.14   |      | .11                |      | -.05                |         | -.31             |         |       |
| P-UCL-P  | .12    |      | .09                |      | .25                 |         | .04              |         |       |
| P-REHAB  | -.02   |      | -.03               |      | -.12                |         | -.28             |         |       |
| P-POV    | -.06   |      | .10                |      | -.08                |         | .03              |         |       |
| P-SSIT-C | -.12   |      | .24                |      | -.00                |         | .04              |         |       |
| P-SSIT-W |        | -.34 |                    | .00  |                     | -.15    |                  | -.16    |       |
| P-REA    | .17    |      | .09                |      | .22                 |         | .08              |         |       |
|          |        |      |                    |      |                     |         |                  |         |       |
|          | CPTD1  |      | WCST-P1            |      |                     | DIGITS1 |                  | HANOI1  | DIS1  |
| P-DIGIT  | .19    |      | .02                |      | -.09                |         | -.13             |         | -.13  |
| P-HANOI  |        | -.25 |                    | .20  |                     | -.06    |                  | .81**   | -.01  |
| P-DIS    | -.26   |      | -.08               |      | -.15                |         | .05              |         | .58** |
| P-CPT-d  | -.41*  |      | -.05               |      | -.10                |         | .10              |         | .13   |
| P-UCL-P  | -.06   |      | .16                |      | .00                 |         | .23              |         | -.05  |
| P-REHAB  | -.07   |      | -.21               |      | -.28                |         | -.08             |         | .04   |
| P-POV    | .00    |      | -.03               |      | -.13                |         | -.02             |         | -.01  |
| P-SSIT-C | .02    |      | -.13               |      | .15                 |         | -.05             |         | -.11  |
| P-SSIT-W |        | .19  |                    | -.05 |                     | -.04    |                  | -.04    | -.12  |
| P-REA    | .08    |      | -.08               |      | .41*                |         | -.10             |         | .21   |
|          |        |      |                    |      |                     |         |                  |         |       |
|          |        |      |                    |      |                     |         |                  |         |       |
|          | UCL-P1 |      | REHAB1             |      |                     | SSIT-C1 |                  | SSIT-W1 |       |
| P-DIGIT  | -.22   |      | -.11               |      | .26                 |         | .19              |         |       |
| P-HANOI  |        | -.07 |                    | .21  |                     | .05     |                  | -.07    |       |
| P-DIS    | -.03   |      | .11                |      | -.35                |         | -.01             |         |       |
| P-CPT-d  | -.12   |      | .25                |      | .06                 |         | .10              |         |       |
| P-UCL-P  | -.32   |      | .30                |      | .02                 |         | -.07             |         |       |
| P-REHAB  | -.22   |      | .52**              |      | -.08                |         | .25              |         |       |
| P-POV    | -.06   |      | .07                |      | .25                 |         | .09              |         |       |
| P-SSIT-C | .08    |      | -.20               |      | -.23                |         | -.11             |         |       |
| P-SSIT-W |        | -.05 |                    | -.15 |                     | .15     |                  | -.40*   |       |
| P-REA    | -.13   |      | .09                |      | -.07                |         | .12              |         |       |
|          |        |      |                    |      |                     |         |                  |         |       |
|          |        |      |                    |      |                     |         |                  |         |       |
|          | POV1   |      | REA1               |      |                     |         |                  |         |       |
| P-DIGIT  | .20    |      | -.06               |      |                     |         |                  |         |       |
| P-HANOI  |        | .02  |                    | .01  |                     |         |                  |         |       |
| P-DIS    | -.03   |      | .17                |      |                     |         |                  |         |       |
| P-CPT-d  | .11    |      | .20                |      |                     |         |                  |         |       |
| P-UCL-P  | -.02   |      | -.03               |      |                     |         |                  |         |       |
| P-REHAB  | .11    |      | -.14               |      |                     |         |                  |         |       |
| P-POV    | .66**  |      | -.01               |      |                     |         |                  |         |       |
| P-SSIT-C | -.12   |      | .05                |      |                     |         |                  |         |       |
| P-SSIT-W |        | -.17 |                    | .01  |                     |         |                  |         |       |
| P-REA    | -.03   |      | .69**              |      |                     |         |                  |         |       |

N of cases: 54      2-tailed Signif: \* - .01    \*\* - .001



**Table 8.18:** The prediction of improvement on proceduralization during the 1st stage (Multiple regression analysis).

| Independent variables: HANOI1, CPT-d1. |                      |                      |            |       |                   |
|--|----------------------|----------------------|------------|-------|-------------------|
| Dependent Variable                     | Step                 | % explained variance | multiple R | F     | Significance of F |
| SIHANOI                                | 1. HANOI1<br>2. ---- | 66                   | .81        | 99.89 | .0000             |

**Table 8.19:** The prediction of improvement on reality distortion during the programme (Multiple regression analysis).

| Independent variables: REA1, DIGITS1. |                       |                      |            |                |                   |
|---------------------------------------|-----------------------|----------------------|------------|----------------|-------------------|
| Dependent Variable                    | Step                  | % explained variance | multiple R | F              | Significance of F |
| P-REA                                 | 1. REA1<br>2. DIGITS1 | 53<br>57             | .73<br>.76 | 58.30<br>34.41 | .0000<br>.0000    |

**Table 8.20:** The prediction of accommodation: outside (n=46) vs inside (n=8) (Oneway analysis of variance).

| Variable at T1      | Df.   | Sum of Squares | F-ratio | F-probability |
|---------------------|-------|----------------|---------|---------------|
| Age                 | 1, 52 | 115.96         | 2.42    | n.s.          |
| Level of Education  | 1, 52 | 0.56           | 0.78    | n.s.          |
| Duration of Illness | 1, 52 | 13.82          | 0.79    | n.s.          |
| Prior Admissions    | 1, 52 | 0.21           | 0.03    | n.s.          |
| DIGITS              | 1, 52 | 2.05           | 0.19    | n.s.          |
| HANOI               | 1, 52 | 257.48         | 0.86    | n.s.          |
| DIS                 | 1, 52 | 69.83          | 6.50    | .01           |
| CPT-d               | 1, 52 | 0.60           | 0.50    | n.s.          |
| WCST-P              | 1, 52 | 0.80           | 0.01    | n.s.          |
| UCL-P               | 1, 52 | 5.35           | 0.43    | n.s.          |
| REHAB               | 1, 52 | 1865.12        | 4.29    | .04           |
| POV                 | 1, 52 | 0.07           | 0.00    | n.s.          |
| SSIT-C              | 1, 52 | 228.31         | 2.95    | n.s.          |
| SSIT-W              | 1, 52 | 0.00           | 0.00    | n.s.          |
| REA                 | 1, 52 | 29.99          | 2.45    | n.s.          |

**Table 8.21:** The prediction of daily activities: outside (n=30) vs inside (n=24 (Oneway analysis of variance).

| Variable at T1      | Df.   | Sum of Squares | F-ratio | F-probability |
|---------------------|-------|----------------|---------|---------------|
| Age                 | 1, 52 | 0.41           | 0.01    | n.s.          |
| Level of Education  | 1, 52 | 0.06           | 0.08    | n.s.          |
| Duration of Illness | 1, 52 | 3.56           | 0.20    | n.s.          |
| Prior Admissions    | 1, 52 | 4.16           | 0.61    | n.s.          |
| DIGITS              | 1, 52 | 0.37           | 0.04    | n.s.          |
| HANOI               | 1, 52 | 500.21         | 1.70    | n.s.          |
| DIS                 | 1, 52 | 69.51          | 6.50    | .01           |
| CPT-d               | 1, 52 | 0.30           | 0.25    | n.s.          |
| WCST-P              | 1, 52 | 0.00           | 0.00    | n.s.          |
| UCL-P               | 1, 52 | 8.89           | 0.71    | n.s.          |
| REHAB               | 1, 52 | 1737.87        | 3.97    | .05           |
| POV                 | 1, 52 | 120.00         | 2.45    | n.s.          |
| SSIT-C              | 1, 52 | 64.53          | 0.80    | n.s.          |
| SSIT-W              | 1, 52 | 0.13           | 0.24    | n.s.          |
| REA                 | 1, 52 | 8.89           | 0.70    | n.s.          |

### 8.6.3 Conclusion.

In the present study, first or second assessment score on each variable only explains its own improvement during the first stage, the programme, or the second stage. The only (but rather unimportant) exception is the DIGITS-score at the first assessment. The reproduction of declarative information explains 4% of variance of improvement during the programme on reality distortion.

Information processing (CPT-d') does not explain variance of the improvement during the programme on any of the variables. Thus, CPT-d' does not predict the success of the programme. Hypothesis 2b is rejected.

In section 8.3 it was concluded that patients with very high cognitive disorganization score and very poor general behaviour seem to be unable to participate in the programme for 75% or more. In the present section it is also found that these patients, if they do participate 75% or more, seem to be less able to live and work outside the clinic after the programme.