Appendix 1

Checklist for assessing methodological quality of studies with within-subject repeated measures design

Date..... Reviewer: .....

First author……

Study title .....

Year of publication……

External validity

1. Was a representative sample of participants used?	good / moderate / poor
2. Was size of visual field defect sufficiently specified?	good / moderate / poor
3. Was macular sparing/splitting specified in terms of measurement of macular sparing/splitting?	good / moderate / poor

Internal validity

4. Was restitution of visual field adequately measured?	good / moderate /poor
5. Was visual search field adequately measured?	good / moderate / poor
6. Was reading performance adequately measured?	good / moderate / poor
7. Was functional outcome adequately measured?	good / moderate / poor
8. Were stimuli of outcome measures derived from the stimuli of the training program or vice versa?	good / moderate / poor
9. Was co-morbidity identified as a confounding factor and controlled for?	good / moderate / poor
10. Was spontaneous recovery identified as a confounding factor and controlled for?	good / moderate / poor
11. Were examiners blinded to clinical information from participants?	good / moderate / poor

Item 1 Was a representative sample of participants used?

The following characteristics of the study population were explicitly described :

- inclusion and exclusion criteria, age, sex, time after onset after the lesion, etiology of the lesion (specified in terms of vascular lesions, trauma, tumor, cerebral inflammation), location of lesion (specified in posterior thalamus, occipito-parietal cortex, temporal cortex, optic radiation, striate cortex) : *good*
- inclusion and exclusion criteria, age, sex, without mentioning time after onset after lesion or without specifying etiology of the lesion: *moderate*
- not described: *poor*

Specification of the location of the lesion gives the possibility to analyse the influence of other deficits like visuo-spatial disorders or visual agnosia. Time after onset can be an important indication as period of sponteanous recovery. Specification the etiology of the brain injury is essential since different causes, like a vascular lesion or a tumor can influence the course of the brain injury differently.

Item 2 Was size of HVFDs sufficiently specified?

- specified in degrees and/or diagrams, graphics: *good*
- description left/right, complete/incomplete hemianopia,quadranopia: *moderate*
- not described: *poor*

Item 3 Was macular sparing/splitting specified in terms of measurement of macular sparing/splitting?

- specified in degrees and/or diagrams, graphics: *good*
- description macular splitting/sparing: *moderate*
- not described: *poor*

The size of the HVFDs and the presence or absence of macular sparing/splitting depends of the location of the lesion of the brain and varies between patients. The description of the type of visual field was considered as an important contribution for external validity.

Item 4 Was restitution of visual field adequately measured?

- fixation control was assessed by a method which allowed the investigator to see a display of the retina image, the fixation cross and the stimuli simultaneously: *good*
- fixation control was performed by the patient, for example responding to a randomly change of color of the fixation point with the control of the investigator and/or of a video camera: *moderate*
- fixation control was performed by the patient for example responding to a randomly change of color of the fixation point without the control of the investigator and/or by a video camera : *poor*

The aim of the VRT is to increase visual field size by shifting the absolute visual field border and improving detection ability in areas of residual vision. Stimulation in this area could provoke saccadic eye movements towards the stimulus, which can be misinterpreted as a visual field recovery. Therefore fixation control was defined as criterion to assess whether the restitution of visual field was adequately measured.
The following measurement methods are discussed with regard to fixation control:

SLO is a method to detect absolute HVFDs with high spatial resolution. The method provides a simultaneous assessment of the retinal image and the stimulus in the central 10-degree visual field, thus allowing an absolute fixation control.
Perimetric/campimetric instruments are fundamentally different from the SLO.
HRP is a campimetric procedure to detect small visual stimuli above detection threshold and the stimuli are presented in the central 27-degree visual field on a computer monitor. As fixation control the fixation point randomly changes its color whereupon the patient has to respond. Perimat, Periform and Pericolor are a type of automated perimetry, with various computer programs up to 40 degree visual field. In Perimat small light stimuli are presented in random position on a black screen, Periform examines the patient's ability to recognize orientations and Pericolor assesses colour perception.Fixation was controlled with a video camera.
TAP is a static perimeter where the visual field up to 30 degrees eccentricity is determined by presenting stimuli near threshold detection. The spatial resolution of TAP is relatively low. Fixation is controlled with a video camera. Goldmann is a kinetic perimeter with a visual field up to 180 degrees eccentricity using stimuli in a hemisphere. Fixation is controlled by the investigator.

Item 5 Was visual search field adequately measured?

- combination of tests of visual search field such as perimetric/ campimetric measures, slides, table test: *good*
- only perimetric tests: *moderate*
- no test: *poor*

The term 'visual search field' is defined as the area that a patient can actively scan by eye movements but without head movements. The training of visual search field consists usually of different steps from learning eye movements strategies to systematic scanning strategies. Perimetric tests do not adequately measure scanning strategies. Therefore a combination of tests was defined as a criterion to evaluate if visual search field was adequately measured such as perimetric instruments to assess the visual field and specific visual search field tests as identifying objects visually on a table or on slides.

Item 6 Was reading performance adequately measured?

- retest-reliability of the reading tests was determined : *good*
- standardized reading test were used: *moderate*
- retest-reliability of the reading tests was not determined and no standardized reading tests were used : *poor*

In general reading tests are used for measurement of reading performance, assessing reading time and reading errors. When the tests are highly reliable, they are sensitive to changes in reading performance during therapy. Therefore retest-reliability of the reading tests was defined as criterion to assess whether the reading performance was adequately measured.

Item 7 Was functional outcome adequately measured?

- validated observation of ADL tasks and/or validated questionnaires: *good*
- not validated instruments like structured interviews, questionnaires: *moderate*
- no reported instruments like questions: *poor*

As the functional outcome is a subjective measure, validated questionnaires or validated observations of ADL tasks were defined as criterion to assess functional outcome.

Item 8 Were stimuli of outcome measures derived from the stimuli of the training program or vice versa?

- None of the stimuli of the outcome measures were derived from the stimuli of the training program: *good*
- majority of the stimuli of the outcome measures was not derived from the stimuli of the training program: *moderate*
- majority of the stimuli of the outcome measures was derived from the stimuli of the training program: *poor*

Possible source of bias: using similar stimuli in training programs as in outcome measures.

Item 9 Was co-morbidity identified as a confounding factor and controlled for?

- co-morbidity was mentioned in particular higher order visual deficits like visual neglect, visual agnosia, alexia and neuropsychological tests were performed: *good*
- co-morbidity was only mentioned: *moderate*
- co-morbidity was not mentioned: *poor*

Possible source of bias: higher order visual deficits like visual neglect, visual agnosia, alexia.

Item 10 Was spontaneous recovery identified as a confounding factor and controlled for?

- time of onset was controlled for > 1 year : *good*
- time of onset was controlled for < 1 year and post hoc: *moderate*
- time of onset was not controlled for and only mentioned: *poor*

Possible source of bias: spontaneous recovery since time of onset.

Item 11 Were examiners blinded to clinical information from participants?

- examiners were blinded : *good*
- examiners were not blinded/ not reported*: poor*

To avoid bias it is desirable that examiners proceed without knowing clinical information. Blinding the examiners to clinical information contributes to internal validity.