Author's response to reviews

**Title:** Observational Skills Assessment Score: reliability in measuring amount and quality of use of the affected hand in unilateral Cerebral Palsy

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**Author's response to reviews:** see over
Hoensbroek, July 16th 2013

Mr. Josefino M. Rodis
Journal editorial office
BMC Neurology

Dear Mr. Josefino M. Rodis,

On behalf of all authors, I hereby send you the revised manuscript “Observational Skills Assessment Score: reliability in measuring amount and quality of use of the affected hand in unilateral Cerebral Palsy” (version final 3), as you asked me in your mail from June.

We revised the paper according to the reviewers’ comments. In the following pages answering the reviewers’ comments we gave a point by point description of the changes made.

We hope that the revised paper will meet the high standards of BMC Neurology. Hoping to hear from you soon, I remain

Yours sincerely

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Observational Skills Assessment Score: reliability in measuring amount and quality of use of the affected hand in unilateral Cerebral Palsy. Comments on final version 2.

We would like to thank the reviewers for their comments and suggestions. We have revised our article based on these comments, and we will explain the changes made, in this document.

Reviewer 1

Reviewer’s report

Title: Observational Skills Assessment Score: reliability in measuring amount and quality of use of the affected hand in unilateral Cerebral Palsy

Version: 2 Date: 14 April 2013

Reviewer: Styliani Milioti

Reviewer’s report:

Major Compulsory Revisions

Overall: In my opinion the sections “Method” and “Participants & study design” need rewriting.

Method:

This section must be placed after the Participants description

Participants and study design:

The separation of the first paragraph, concerning the participants description (A convenience sample of ………….able to perform these tasks.) placed before the “Methods” section with the title “Participants”, will make it easier for the reader to follow.

The second paragraph (The three tasks………. 4 assessors for both age groups) must be included to the Method section before the OSAS administration protocol and the OSAS scoring protocol.
According to the GRRAS guidelines the description of the participants is a part of the methods section. We agree with you, that in this section first the study design and participants, than raters, statistics, results and discussion should be mentioned. But we felt it necessary to first describe the development, description, administration and scoring of the OSAS, because otherwise it is not clear what kind of assessment subject is of this reliability study.

Minor Essential Revisions

Discussion:

2nd Paragraph, last sentence (In conclusion, the OSAS …………………………
bimanual performance in CP children). Please replace the word performance with the word task of function since according to ICF, you have mentioned already, there is a clear distinction between “performance” and “capacity” and in your study you are not measuring performance but capacity.

This was changed as follows:

In conclusion, the OSAS appears to be a reliable assessment tool, with good agreement between repeated measurements, to measure quality of use of the affected assisting hand in forced bimanual task execution in CP children.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
'I declare that I have no competing interests'
Reviewer's report

Title: Observational Skills Assessment Score: reliability in measuring amount and quality of use of the affected hand in unilateral Cerebral Palsy

Version: 2 Date: 27 May 2013

Reviewer: Ann-Kristin Gunnes Elvrum

Reviewer's report:

This study aimed to measure intra- and inter-rater reliability, and test-retest reliability of the newly developed Observational Skills Assessment Score (OSAS) in children with unilateral spastic cerebral palsy (CP). A convenient sample of 32 children with unilateral spastic CP was included with 16 children in each of the following age groups: 2.5-6 (younger age group) and 12-16 (older age group) years of age. Three age specific bimanual tasks were performed in both groups. All children performed one measurement session. Two measurements sessions were performed six weeks apart for all children in the older age group and two weeks apart for ten children in the younger age group. A total of three experienced therapists participated in testing and eight physiotherapists or occupational therapists performed the ratings. The authors found that OSAS appears to be a reliable assessment tool of quality of use of the affected hand, with good agreement between repeated measures.

There are some shortcomings in this manuscript that need to be addressed.

Major compulsory revisions:

1. More precise descriptions with references are needed in the Background to clarify how the authors define capacity and performance. This will have implications for the rest of the manuscript.
This was done in the last sentence of the first paragraph of the Background section (Therefore, evaluation of hand function over time or after treatment should focus on the actual use of the affected hand in bimanual activities of daily life, i.e. bimanual performance, as well as on the maximum potential capability to use the affected hand in bimanual tasks, which is called capacity), with referral to the article of Lemmens et al. Valid and reliable instruments for arm-hand assessment at ICF activity level in persons with hemiplegia: a systematic review. *BMC Neurology* 2012, 12:21.

2. The rational for and aim of OSAS is unclear. It says in the Background, 3rd paragraph that OSAS combines both aspects of unilateral capacity (MUUL) and bimanual performance (AHA), but it is unclear what is meant by this. Is both capacity and performance assessed, or do the authors refer to the terms unilateral and bilateral?

In the Background section this was rewritten as follows:

In hindsight this is not surprising because the MUUL contains many items relating to target accuracy, which cannot be expected to be influenced by BoNT-A. Furthermore, it measures unilaterally and contains tasks that are usually not done by the assisting hand. In 2007 the AHA was specifically developed to assess the spontaneous use of the assisting hand in bimanual performance. Use of the affected hand is stimulated but not obligated in the AHA. We felt the need for an instrument that measures the potential capability of the affected hand in bimanual skills: the capacity of the affected (assisting) hand. Therefore, we developed the Observational Skills Assessment Score (OSAS) using basic ideas of the Video Observation Aarts and Aarts (VOAA) [13]. Whereas the MUUL measures unilateral capacity and the AHA measures actual use in bimanual performance, the OSAS measures both amount and quality of use of the affected hand in tasks in which both hands have to be used obligatory.

The description of OSAS in the Method adds to the confusion. Is the child “forced to use the hand” (stated in the 1st paragraph, Method section) or is “spontaneous use” assessed (stated in the 3rd paragraph, Methods section)? A more thoroughly and detailed description of the scope, tasks and administration of the tasks of OSAS would be helpful.

In the first paragraph of the Methods section “In these tasks, the child is forced to use its affected hand repetitively.” was replaced by “These tasks cannot be performed by the child without repetitively using the affected hand.” In the third paragraph of the methods section the word “spontaneous” was deleted, because it leads to confusion.
We added an addendum in which the construction tasks for the older age group are described in detail.

3. It is confusing to read the description of various numbers of participants and raters for different reliability measures in the Method. Is it possible to make a flow chart to clarify this?

A flow chart of the reliability assessments and raters was added, figure 2.

4. The Guidelines for Reporting Reliability and Agreement Studies (GRRAS) are referred to in this manuscript, which is good. However, when comparing this manuscript with the GRRAS guidelines there are some shortcomings that need to be addressed. For example the sampling method for both rated subjects and raters are not clearly stated. The sampling method used in this study allows for blinding, but it is not clear whether blinding was actually used. Furthermore it is unclear what kind of training was provided to the raters and if the rating was done independently.

In our opinion the sampling methods for the participants and raters was described in paragraph Participants and study design (A convenience sample of 16 children aged 12 to 16 years (older age group) and 16 children aged 2.5 to 6 years (younger age group) with unilateral spastic CP performed the tasks. The older children participated in a constrained induced therapy program and the younger children in a BoNT-A and/or specific therapy effect study) and Raters (The assessors were physiotherapists or occupational therapists trained by an occupational therapist who is co-developer of the OSAS), of the Methods section. Also the training was described in this paragraph and whether rating was done independently. The videotapes for the intra-rater reliability were renamed (see flow diagram), which allowed blinded scoring.

5. In this study both quality of use of the affected hand (categorical data) and amount of use (continuous data?) were scored. Has it been considered to use different statistical methods for the various data?
We are aware that in this reliability study continuous data were used in amount of use (percentages) and ordinal data for quality of use. Despite this difference we have chosen to report both data according to the method described by de Vet et al. ([Measurement in Medicine. Cambridge University Press 2011](#)), i.e. mean differences of the two measurements and their standard deviations (SD) were computed. Intra Class Correlation (ICC) values of these mean scores were computed to determine the intra-rater, the inter-rater and test-retest reliability of both amount and quality of use and the Standard Error of Measurement (SEM) and the Smallest Detectable Difference (SDD) were calculated as measures of agreement.

6. There is a lot of information in the Results and a lot of numbers and information in the figures and tables. Maybe it could be considered to separate the reporting of the reliability of OSAS for the two age groups since different tasks are performed?

We tried to make it more clearly by reporting the means and ranges and the reliability data for the older and younger age group separately.

7. Limitations of the study are not clearly stated in the Discussion.

Limitations were added in Discussion section as follows:

In the present study 32 children, between the age of 2.5 and 16 years were included in the intra- and inter-rater reliability analyses and 26 children in the test-retest reliability analysis. This number is limited. Moreover, children aged 7-11 years old were not included in the present study. But part of the OSAS is developed for children aged 7-16 years old. Reliability data from this age group should be collected in the near future.

Minor Essential Revisions:

1. 1st paragraph, Background: A more precise description of hand function problems in children with unilateral CP could be to include the motor component of the impairment with additional references.
See literature referral: Children with clinically apparent unilateral Cerebral Palsy (CP) have specific hand function problems. If they use their affected hand, it is always as an assisting hand. Even with only minor impairment of their affected hand, they do often not use it to its full potential in bimanual tasks. This is called developmental disregard [1,2,3,4].

2. 3rd paragraph, Background: Which tasks on the MUUL is not suitable for the assisting hand (except the drawing task)? Is this the authors’ impression or do you have a reference for this statement?

The drawing task, grasp and release of the pellet, reach to brush and reach to bottom are tasks that are usually performed by the dominant, non-affected hand, which is based on our clinical experience.

3. 3rd paragraph, Background: What is meant by “The task was chosen to match the children’s level of spatial insight and praxis to prevent the influence of cognitive aspects” and how was this determined? This is also mentioned in the Discussion (6th paragraph) but no references are given.

The text was changed as follows: Due to developmental problems task performance especially in young children can be influenced by visual spatial insight, praxis and cognitive aspects [14]. Therefore the OSAS’ tasks were chosen appropriate for the children’s age and their intellectual abilities to prevent these influences on task performance. In chapter 8 of "Illingworth RS. The Development of the Infant and Young Child. Normal and abnormal. Churchill Livingstone 1980 seventh edition." normal development is described and in chapter 14 the influence of mental retardation. We hope this clarifies what we intended to mention.

Discretionary Revisions:

1. BoNT-A is a more commonly used abbreviation for Botulinum toxin A than btA.

BtA was replaced by BoNT-A.

2. 2nd paragraph, Background: Maybe it is not necessary to list all the
instruments included in the review by Gilmore et al (2010), but merely refer to the conclusion?

You are right, we changed it and it makes interpretation easier.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.