

Data Request form YOUth (version 6.0, February 2020)

Introduction

The information you provide here will be used by the YOUth Executive Board, the Data Manager, and the Data Management Committee to evaluate your data request. Details regarding this evaluation procedure can be found in the Data Access Protocol.

All data requests will be published on the YOUth researcher's website in order to provide a searchable overview of past, current, and pending data requests. By default, the publication of submitted and pending data requests includes the names and institutions of the contact person and participating researchers as well as a broad description of the research context.

After approval of a data request, the complete request (including hypotheses and proposed analyses) will be published. If an applicant has reasons to object to the publication of their complete data request, they should notify the Project Manager, who will evaluate the objection with the other members of the Executive Board and the Data Management Committee. If the objection is rejected, the researcher may decide to withdraw their data request.

Section 1: Researchers

In this section, please provide information about the researchers involved with this data request.

- Name, affiliation and contact information of the contact person
- Name and details of participating researchers (e.g. intended co-authors)
- Name and details of the contact person within YOUth (if any)

Contact person for the proposed study:	
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Section 2: Research context

In this section, please briefly describe the context for your research plans. This section should logically introduce the next section (hypotheses). As mentioned, please note that this section will be made publicly available on our researcher's website after submission of your request.

Please provide:

- The title of your research plan
- A very brief background for the topic of your research plan

- The rationale for and relevance of your specific research plan
- The specific research question(s) or aim(s) of your research (Please also provide a brief specification)
- A short description of the data you request

References can be added at the end of this section (optional).

Title of the study
Language measures in the YOUth study: Validating the modified N-CDIs and PPVT-III-NL scores

Background of the topic of your research plan, rationale, relevance (max. 500 words)
<p>Within the YOUth study, we are collecting various vocabulary measures: modified versions of the Dutch Communicative Developmental Inventory (N-CDIs), collected around 10 months and 3 years, and the Dutch Peabody Picture Vocabulary Task (PPVT-III-NL) administered around 3 years. The N-CDI is a parent-reported measure of receptive and expressive vocabulary, while the PPVT measures receptive vocabulary during a task administered by a test assistant. Both tasks are validated and normed, but the norming of the N-CDI is based on Flemish children (Zink & Lejaegere, 2002, 2003). We are collecting modified versions of the N-CDIs where typical Flemish words are replaced by similar Dutch words. In addition, the N-CDIs used in the YOUth study have a unique combination of the short (vocabulary) and long (grammar) forms. Lastly, we have adjusted the administration of the N-CDI and PPVT by partially automating it. Since these tasks are not usually administered on computers, it is important to confirm that the results are valid and that the automated scripts do not introduce any unexpected negative effects. All in all, it is vital to establish whether the adjusted N-CDI used in YOUth produces valid vocabulary scores. The first aim of this study is to assess the adjusted N-CDI's validity and internal consistency.</p> <p>We can assess the adjusted N-CDI's concurrent validity by comparing the N-CDI scores obtained around 3 years of age to the PPVT scores obtained around the same time. The PPVT is previously validated and normed on Dutch children in the Netherlands (Schlichting, 2005). It is also important to check for internal consistency within the modified N-CDI, because we combined parts of the long and short versions of the questionnaire. Lastly, we can check its predictive validity by examining whether N-CDI scores obtained around 10 months of age can predict N-CDI and PPVT scores around 3 years of age. The present study is not intended as a norming study, but we hope to establish that the modified N-CDI is a useful instrument to assess Dutch children's vocabulary scores around 10 months of age and 3 years of age. This analysis shows whether we can reliably use these scores to predict children's vocabulary sizes in future studies.</p> <p>The second aim of this study is to evaluate whether there are any individual differences affecting vocabulary scores and test validity. Previous studies have found that, for example, girls have higher vocabulary scores on standardized tests, and the CDI has higher validity for girls (Reese & Read, 2000). Children of caregivers' with a high socio-economic status (SES) also have higher test validity (e.g., Reese & Read, 2000). There are many more factors negatively influencing early vocabulary, for example, a bilingual language background (e.g., De Houwer, 2019), a low birth weight and/or preterm birth</p>

(e.g. Brósch-Fohraheim et al., 2019; Leijon et al., 2016). We do not know how these factors influence the validity of the adjusted N-CDI. We need to know this in order to reliably use this task for all children included in the YOUth cohort study.

The specific research question(s) or aim(s) of your research

The main aim of this study is to assess the validity of the modified N-CDIs used in the YOUth cohort study. The second aim is to examine individual differences affecting children's vocabulary scores and test validity.

Summary of the data requested for your project: Please indicate which data you request to answer your research question.

- N-CDI collected around 10 months of age (R0) and around 3 years of age (R3)
- Peabody Picture Vocabulary Task data collected around 3 years of age (R3)
- Questionnaires on spoken languages in the child's environment, family income and economic situation, child's medical history (at least including birth weight and gestational age at birth)
- Sex and ages in weeks of participants at the moment of data collection

References (optional)

Dunn, L. M., Dunn, L. M., Bulheller, S., & Häcker, H. (1965). Peabody picture vocabulary test. Circle Pines, MN: American Guidance Service.

Feldman, H. M., Dale, P. S., Campbell, T. F., Colborn, D. K., Kurs-Lasky, M., Rockette, H. E., & Paradise, J. L. (2005). Concurrent and Predictive Validity of Parent Reports of Child Language at Ages 2 and 3 Years. *Child Development*, 76(4), 856–868.

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Fenson, L., Dale, P.S., Reznick, J.S., Thal, D., Bates, E., Hartung, J.P., Pethick, S. & Reilly, J.S. (1993). *MacArthur Communicative Development Inventories: User's guide and technical manual*. San Diego: Singular Publishing Group, Inc.

O' Toole, C., & Fletcher, P. (2010). Validity of a Parent Report Instrument for Irish-speaking Toddlers. *First Language*, 30(2), 199–217.

<https://doi.org/10.1177/0142723709359237>

Pan, B. A., Rowe, M. L., Spier, E., & Tamis-LeMonda, C. (2004). Measuring productive vocabulary of toddlers in low-income families: Concurrent and predictive validity of three sources of data. *Journal of Child Language*, 31(3), 587–608.

<https://doi.org/10.1017/S0305000904006270>

Reese, E., & Read, S. (2000). Predictive validity of the New Zealand MacArthur Communicative Development Inventory: Words and Sentences. *Journal of Child Language*, 27(2), 255–266. <https://doi.org/10.1017/S0305000900004098>

Schlichting, L. (2005). Peabody picture vocabulary test-III-NL. Amsterdam, the Netherlands: Hartcourt Assessment BV.

Zink, I. & Lejaegere, M. (2002). *N-CDI's: lijsten voor Communicatieve Ontwikkeling. Aanpassing en hernormering van de MacArthur CDI's van Fenson et al.* Leuven/Leusden: Acco.

Zink, I. & Lejaegere, M. (2003). *N-CDI's: korte vormen, Aanpassing en hernormering van de MacArthur Short Form Vocabulary Checklist van Fenson et al.* Leuven/Leusden: Acco.

Section 3: Hypotheses

In this section, please provide your research hypotheses. For each hypothesis:

- Be as specific as possible
- Provide the anticipated outcomes for accepting and/or rejecting the hypothesis

Hypotheses

- **Predictive validity:** High predictive validity suggests that the N-CDI score obtained around R0 can predict vocabulary scores obtained around R3 of the same participant. Previous studies on other versions of the CDI have shown repeatedly that there is predictive validity among CDI scores obtained at different time points. For example, a study validating the New Zealand CDI (Reese & Read, 2000) found highest predictive validity for the components measuring vocabulary size in the NZ CDI and results of the PPVT almost two years later ($r = .48, p < .01$). If the modified N-CDI has the same predictive validity, we expect similar correlations in the YOUTH data.
- **Internal consistency:** The first reliability measure is internal consistency, which measures whether the different parts of the N-CDI correlate with one another. The vocabulary section of the adjusted N-CDI in YOUTH contains a unique combination of the short-form for the section “words” and the long-form for the section “gestures & actions”. It is therefore important to check whether scores obtained on this adjusted section (i.e., the vocabulary section) correlate with scores obtained in the unaltered grammar section. Previous studies have found moderate to high correlations between the vocabulary and grammar sections of the CDIs ($r = .41 - r .76$) (Reese & Read, 2000). If scores obtained in the short vocabulary section of the N-CDI correlate with scores obtained in the grammar section, this shows that the unique combination of long and short forms is valid, and the adjusted N-CDI has internal consistency.
- **Concurrent validity:** The second reliability measure is the modified N-CDI’s concurrent validity. We expect that the scores obtained in the N-CDI during R3 can predict the scores obtained during the PPVT task also administered during R3. The PPVT is a well-established measure of children’s receptive vocabulary scores, which can be used to assess the concurrent validity of the adjusted N-CDI. High validity suggests that both tasks measure the same construct: vocabulary size.
- **Individual differences:** We expect there are individual differences which affect predictive validity and reliability. First, we expect a significant influence of children’s sex. Previous studies have shown that girls tend to have higher

vocabulary scores on these standardized tests and CDIs show higher validity for girls (e.g., Reese & Read, 2000). Secondly, we expect children’s N-CDI scores to be higher for children of caregivers with less education (e.g., Feldman et al., 2000; Reese & Read, 2000). We also expect the N-CDI to have higher predictive validity for PPVT scores for participants of lower SES, as previously found by Reese and Read (2000). Thirdly, we expect that a longer time gap between R0 and R3 (i.e., older age at R3) negatively affects the predictive validity of the N-CDI at R0. Fourthly, we expect that low birth weight and low gestational age affects vocabulary scores (e.g. Brósch-Fohraheim et al., 2019; Leijon et al., 2016). Lastly, we expect bilingualism to affect test scores when bilingual children are only tested in one of their native language (e.g., De Houwer, 2019). We do not yet know exactly to what extent these factors affect predictive and concurrent validity and internal consistency.

Section 4: Methods

In this section, you should make clear how the hypotheses are tested. Be as specific as possible. Please describe:

- The study design and study population (Which data do you require from which subjects?)
- The general processing steps (to prepare the data for analysis)
- The analysis steps (How are the data analysed to address the hypotheses? If possible, link each description to a specific hypothesis)
- Any additional aspects that need to be described to clarify the methodological approach (optional)

Study design, study population and sample size (e.g. cross-sectional or longitudinal; entire population or a subset; substantiate your choices)

In this study, we would like to use all participants that have completed the N-CDI at R0 (10 months) and the N-CDI and PPVT at R3. There is no need to select a subset, we are planning on using automated tools to obtain all scores. We are using longitudinal data from R0 and R3 in order to examine the predictive validity of the N-CDI.

General processing steps to prepare the data for analysis

1. Creating a dataframe of all PPVT raw scores, children’s ages in weeks, children’s sexes, caregiver SES, birth weight, gestational age at birth, and language backgrounds. We can then use a script previously written by Elizabeth Buimer and Anika van der Klis to automatically obtain all PPVT norm scores.
2. Writing some functions in Microsoft Excel to calculate the N-CDI raw scores for each section and total scores obtained by the participants at both ages (i.e. R0 and R3). Add these raw N-CDI scores for each participant to the dataframe.

Specific processing and analysis steps to address the hypotheses

1. Examine the data using descriptive statistics, specifically checking for normality in the obtained vocabulary scores on both N-CDIs and the PPVT.
2. Calculating Pearson’s correlations for the vocabulary and grammar sections of the N-CDI to assess internal consistency, for N-CDI scores obtained at R0 and N-CDI

and PPVT obtained at R3 to assess predictive validity, and for N-CDI scores at R3 and PPVT scores at R3 to assess concurrent validity.

3. Examining influences on test scores using a linear mixed-effects model. If we find significant effects, we can re-calculate concurrent and predictive correlations for each group in separation (e.g., for girls and boys when assessing infant sex) and use Fisher's z to determine whether the correlations of each group are significantly different. This shows whether the tests are more or less valid for certain groups of participants.

Section 5: Data request

In this section, please specify as detailed as possible which data (and from which subjects) you request.

Data requested

All participants who have currently completed the R0 N-CDI, and R3 N-CDI and PPVT:

- N-CDI questionnaires at R0 and R3
- Peabody Picture Vocabulary Task scores at R3
- Questionnaires regarding languages spoken at home, family socio-economic status, and the child's birth weight and gestational age at birth
- A list with sex and age in weeks of participants at R0 (10 months) and R3 measurements.

Data request for the purpose of:

- Analyses in order to publish
 Analyses for data assessment only (results will not be published)

Publication type (in case of analyses in order to publish):

- Article or report
 PhD thesis
 Article that will also be part of a PhD thesis

Would you like to be notified when a new data lock is available?

- Yes
 No

Upon approval of a data request, the complete request will be made publicly available on our researcher's website by default.

Do you agree with publishing the complete request on our researcher's website after it is approved?

- Yes
 No. Please provide a rationale