



Ontology of **expressive communication**



Speech fluency and word finding

Type of measure: Active task.

Definition of measure: A score on a task involving either open-ended descriptive speech by the patient or a structured task.

Considerations: The task should be relevant to a real life scenario, such as a description of a realistic scene or naming naturalistic stimuli.

Outcomes to be measured: Single-feature score, multi-feature score.

Example: Present the participant with a picture to describe within a given time frame. Record the speech and assess vocal markers related to fluency (filled and unfilled pauses) and semantic content.

Expressive communication tasks in the literature: [Picture description task](#), [confrontation naming](#), [semantic verbal fluency](#)

From patients and care partners:

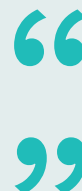
“[If communication worsened I'd be] unable to express my views, [I] don't know how to seek help.” - Patient, China

“I'll speak freely what I think, now sometimes I can't focus and think of the words, I forget exactly what I want to say.” - Patient, Bulgaria

“I want to speak well again, now they don't understand me I can't say the words well.” - Patient, Bulgaria

“I think it is essential to communicate in order not to lose your values as a person, to know who is with you, to maintain an enriching conversation for both of you. Since the lack of communication immerses you in more loneliness and in oneself.” - Care partner, Spain

“She currently gets frustrated at herself and at times even causes a depression. She just turns her head and walks away because she can't express herself.” - Care partner, USA



Resource quicklinks

View the full [Core Digital Measures of AD/DRD conceptual model](#) or jump to another ontology:



[Visuospatial memory](#)



Expressive communication

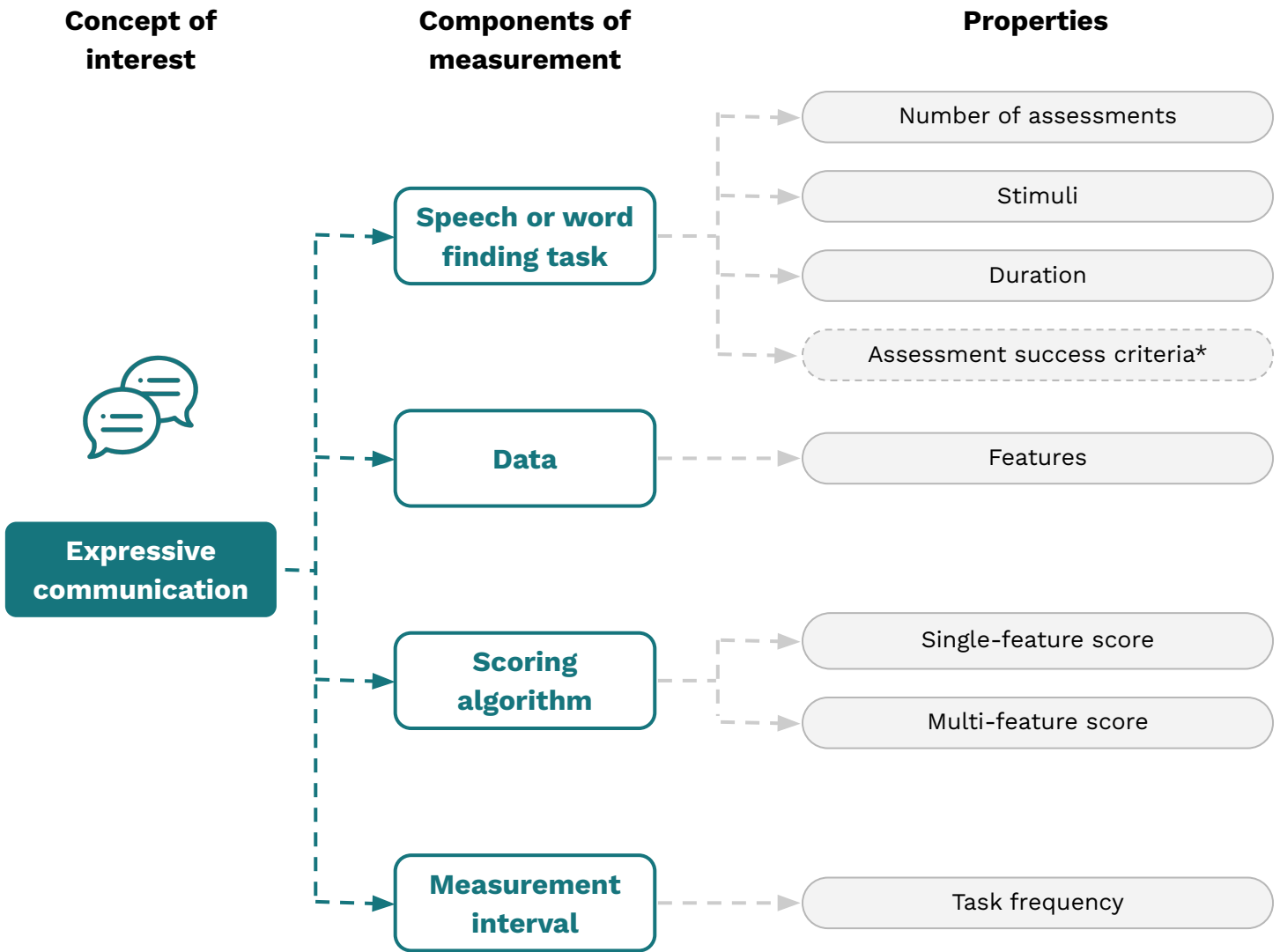


[Sleep disruption](#)



[Non-sedentary behavior](#)

View the [discussion guide](#) for expressive communication



*Not relevant for all tasks

Speech or word finding task



It is necessary to give a broad overview of the task, the reasons it was selected, and the support rationale for use in the intended population, with evidence as to why the task is both relevant and appropriate for a given ADRD diagnosis and stage. For example, is the task a single open-ended description task or a structured word-finding task with multiple assessments?

In addition the following task properties should be defined:

Number of assessments

Report and document rationale for chosen number of assessments within each task. This task could be a single assessment (picture description task) or multiple assessments (confrontation naming).

E.g., X confrontation naming assessments per task were chosen as this number has been shown to lead to a reliable total score.

Stimuli

Report the number, composition, and evidence for standardization of stimuli. Support rationale for selection with evidence. If there are multiple assessments, different stimuli should be used for each assessment.

I.e., if the task is completed daily for several consecutive days, evidence for the standardization of different unique stimuli for each day should be provided.

Duration

Report the amount of time offered to the participant for each assessment in the task with rationale. This metric could be the time offered for the description of an image, or the maximum time offered for naming each stimuli or free recall of words.

E.g., [no time limit, 5 seconds, 60 seconds, etc.] was chosen for each assessment as this limit has previously been shown to be an appropriate amount of time for this task in the intended population.

Assessment success criteria*

Define success criteria for an assessment. Not all tasks, or all prioritized outcomes of a task have an assessment criteria. In the picture description task, correct naming of objects in the scene would have a success criteria, whereas the number of pauses would not.

E.g., a list of acceptable answers for responses to a description or naming task.

*Not relevant for all tasks

Data



It is necessary to report and specify the data collected by the technology employed. This reporting enables the specification of scoring. An additional advantage is that this data can be available to individuals appraising the planned or conducted work. In research activities where data is made available for secondary research (i.e., data hosted on the [Alzheimer's Disease Data Initiative](#)), users can assess the feasibility of the data for their own study aims.

Features

Report the features output by the technology for each assessment. For expressive communication tasks, these features can include but are not limited to lexico syntactic, acoustic, semantic, or syntactic features. Where features are derived from the collected audio data, evidence supporting the procedure and algorithms used to extract or derive features must be provided.

A table of list of features can be provided, as shown in Table 1 in [this example](#). The table can be expanded to include a summary of the evidence for the derivation of features and associated references, or this summary can be included in supplement text. The evidence should be related to the intended population.

Scoring algorithm



It is necessary to report how the data collected will be used to create a metric representing the expressive communication ability of the individual completing the task. The score could use a single feature (e.g., accuracy of recall), or could use a combination of features (e.g., the response speed of accurate responses, a combination of filled and unfilled pauses, etc.). While speed and accuracy may be among the most easy-to-interpret outcomes, more complex scores including a variety of features could be more sensitive to change. Where scores include a variety of features in some combination, care must be taken to ensure that interpretation in line with the meaningful aspect of health (speech fluency and word finding) is not obscured.

Single-feature score

Report the feature used to create a single-feature score. Support this usage with evidence for its validity and how this evidence relates to the intended population.

E.g., accuracy of recall as an integer, a sum of all correct responses in the task. Other possible single-feature score options could be considered, as in [this example](#).

Multi-feature score

Report the features used to create a multi-feature score. The methodology used for feature weighting and rationale for combination must be reported. Support this with evidence for validity and how this evidence relates to the intended population.

E.g., response speed of correct responses. When using more complex multi-feature scores, a detailed description of how features are combined to create a score that relates to the meaningful aspect of health must be provided.

Measurement interval



It is necessary to specify the frequency of assessment. Although at-home digital metrics can be collected frequently, patient burden when completing tasks must be accounted for. Deliberately selecting a set period of time, linked to time periods with rich clinical data (i.e., clinic visits), will help to increase the utility of the data collected (e.g., for validation efforts) and can aid in patient adherence to the task. The exact frequency of data collection is likely task-specific and can be supported through a data-driven approach showing the ideal frequency for a specific measure, like reliability.

Task frequency

Define the period of data collection and the rationale.

E.g., daily for several days linked to a clinic or trial visit.