

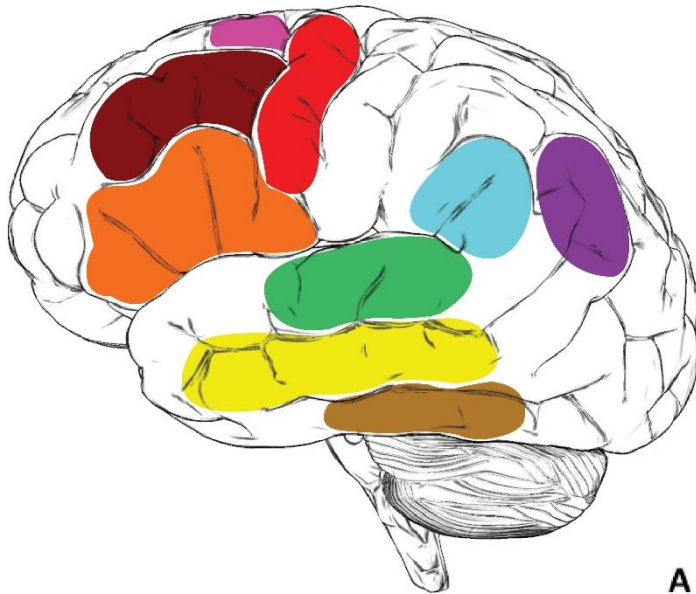
Overview DuLIP tasks

Table 2
Intraoperative linguistic tasks from DuLIP.

Timing of assessment(s)	Linguistic level	Task	Stimuli (examples)
DURING DES (in 4 s)	Phonology	– repetition of words: <ul style="list-style-type: none"> • repetition of 3-syllabic words with alternating word accents • repetition of 2-syllabic words • repetition of words with phonemic similarities • repetition of words with consonant clusters 	– <u>discussie</u> (<u>discu</u> ssion)
			– <u>wortel</u> (<u>car</u> rot)
			– individu (individual)
			– programma (programme)
	Semantics	– repetition of words with consonant clusters	– wijn, pijn, lijn, kat (wine, pain, line, cat) → answer kat (cat)
		– reading with phonological odd word out ^a	– been, arm, raam, voet (leg, arm, window, foot) → answer raam (window)
		– reading with semantic odd word out ^a	– pictures of ‘borstel, hond, kat’ (brush, dog, cat) → answer borstal (brush)
		– naming with semantic odd word out ^a	– auto, fiets ... (car, bike ...) → answer e.g. bus
	Syntax	– semantic association task ^a	– Hij snijdt met een ... (He cuts with a ...) → answer e.g. mes (knife)
		– sentence completion (semantically induced sentences) ^a	– bal (ball) → gooien/werpen (to throw)
– verb generation ^a		– de man ... (the man ...) → answer e.g. loopt (e.g. runs) → picture of a man who is running	
Articulation – praxis	– action naming (3rd person singular, transitive verbs), 60 actions ^a (RUG-Vrije Universiteit Brussel)	– repeat/papapa/, /pataka/, /papopu/, /pafpafpaf/, /dafnaflaf/, /pafpofpuf/, /pafpaspaf/ (5x)	
	– verbal diadochokinesis test	– black and white drawings of objects	
NOT DURING DES	Phonology	– object naming, 100 objects ^a	Dit is ... (this is) → answer hond (dog) → picture of a dog
		– phonological sentence judgment	– De hokkel eet een gersie. (The hokkel eats a gersie.) → ‘hokkel’, ‘gersie’ non-existing words
	Semantics	– phonological fluency	– Letters D, A, T
		– semantic sentence judgment	– De gieter smeert een boterham. (The watering-can prepares a sandwich.) → wrong sentence
		– semantic fluency	– animals/jobs
		– sentence completion (less semantically induced sentences) ^a	– Om 5 uur ... (At 5 O'clock ...) → possible answer: ga ik naar huis (I go home)
	Syntax	– syntactic sentence judgment	– Er was over niets meer van het scheerapparaat. (There was over nothing left of the razer) → wrong word order
		– verbal fluency (verbs)	– verbs

^a Presented with powerpoint slides.

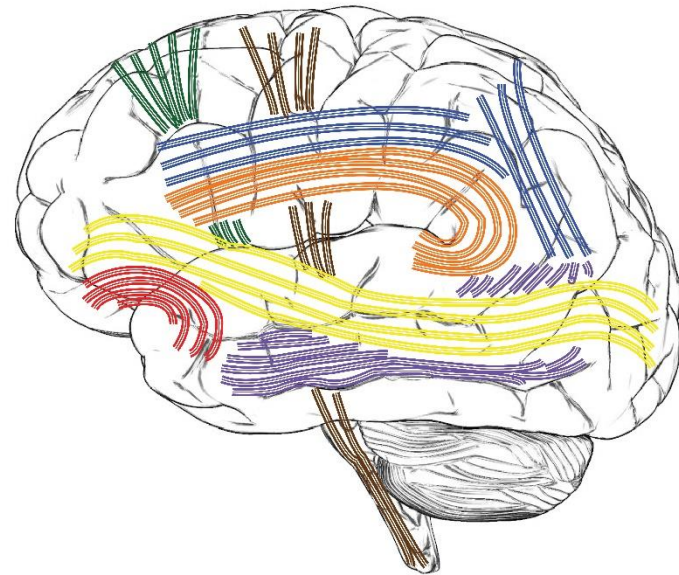
Cortical level: temporal lobe



A

Cortical site	Function	Intraoperative language tasks from DuLIP
inferior frontal gyrus	Articulatory processing/ syntax/ (writing)	Verbal diadochokinesis, repetition/ verb generation, action naming
posterior midfrontal gyrus	Action naming/ (writing)	Action naming
supplementary motor area	Language initiation	Sentence completion (closed and broad context), fluency
precentral gyrus	Motor network	Repetition, verbal diadochokinesis
posterior superior temporal gyrus	semantics, auditory comprehension, naming living objects	semantic picture out, semantic judgment, object naming
middle posterior superior temporal sulcus	Phonological network	Phonological odd word out, phonological judgment
middle inferior temporal gyrus	Lexical interface (link phonological – semantic information), naming non-living objects	Semantic judgment, object naming
Anterior middle temporal gyrus	Famous face naming, (memory)	Naming
supramarginal gyrus	Reading, naming, semantics, (memory)	Reading + sentence completion, semantic association, naming
angular gyrus	Reading, writing, (calculation)	Reading + sentence completion

Subcortical level: Arcuate Fasciculus



Subcortical pathways	Function	Intraoperative language tasks
subcallosal fascicle	Initiation of speech	Fluency, sentence completion
inferior frontal occipital fascicle	Semantics, reading, judgment	semantic association, semantic odd word/picture out, semantic judgment
inferior longitudinal fascicle	Reading Phonology/semantics	Reading + sentence completion, naming
superior longitudinal fascicle (arcuate fascicle)	Articulatory processing/ Phonology	verbal diadochokinesis, repetition/ phonological odd word out
uncinate fascicle	Famous face naming, semantics	Naming, semantic odd picture out
corticospinal tract	Motor speech	Verbal diadochokinesis, repetition