

Supplemental Appendix: A Stable Aphasia

Normative data of AphasiaBank participants for efficiency of accurate/complete main concepts production

	Controls	PWA	NABW	ANO	CON	WER	BRO
Broken Window							
Mean	9.5	2.8	7.1	3.5	2.1	1.4	0.3
SD	4.3	3.5	2.7	3.7	2.6	2.9	0.9
Median	9.0	1.7	6.6	2.9	1.6	0.0	0.0
Range	1.8–22.5	0.0–20.0	2.5–14.1	0.0–20.0	0.0–9.7	0.0–10.9	0.0–0.4
Skew	0.7	1.8	0.7	2.4	1.8	2.7	3.0
Kurtosis	0.4	4.3	0.9	7.0	3.2	7.8	8.8
Refused Umbrella							
Mean	11.6	3.4	9.9	3.8	2.7	1.5	0.4
SD	4.9	3.8	3.4	3.1	2.6	2.1	1.1
Median	11.0	2.2	10.4	3.4	2.2	1.3	0.0
Range	1.8–38.2	0.0–16.8	3.3–16.8	0.0–15.0	0.0–12.7	0.0–8.9	0.0–6.2
Skew	1.6	1.3	–0.1	1.1	1.7	2.8	4.0
Kurtosis	6.3	1.1	–0.4	1.5	4.5	9.8	19.0
Cat Rescue							
Mean	9.4	2.2	6.4	2.7	1.5	0.4	0.2
SD	3.8	2.8	3.1	2.4	1.8	0.6	0.4
Median	9.2	1.1	6.0	2.1	0.9	0.0	0.0
Range	3.0–20.3	0.0–16.2	1.2–16.2	0.0–11.4	0.0–6.5	0.0–2.1	0.0–1.7
Skew	0.8	1.8	1.1	1.5	1.3	1.8	2.4
Kurtosis	1.0	3.6	2.5	2.8	0.7	3.0	5.0
Cinderella							
Mean	5.9	1.3	4.3	1.6	0.9	0.3	0.1
SD	2.5	1.7	1.8	1.4	1.1	0.6	0.3
Median	5.5	0.7	3.9	1.2	0.5	0.0	0.0
Range	0.8–14.5	0.0–9.3	1.4–9.3	0.0–5.9	0.0–4.1	0.0–1.9	0.0–1.8
Skew	0.8	1.7	0.9	1.5	1.6	2.4	3.8
Kurtosis	0.9	2.9	1.3	2.3	2.0	4.7	15.8
Sandwich							
Mean	11.8	2.9	8.6	3.6	2.0	0.6	0.3
SD	5.8	4.9	5.8	5.3	3.5	1.8	1.2
Median	11.3	0.2	7.6	2.0	0.0	0.0	0.0
Range	0.6–30.0	0.0–28.0	0.0–21.2	0.0–28.0	0.0–15.0	0.0–7.5	0.0–5.8
Skew	0.6	2.4	0.6	2.6	2.5	3.7	4.6
Kurtosis	0.3	6.4	–0.1	8.0	6.2	14.4	20.0

Normative data of AphasiaBank participants for core lexicon production

	Controls	PWA	NABW	ANO	CON	WER	BRO
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Broken Window							
Mean	34.8	18.5	31.4	20.6	16.1	16.4	10.7
SD	13.5	13.3	11.9	14.4	8.6	14.3	8.2
Median	34.3	15.7	26.8	16.6	14.8	12.3	7.4
Range	6.7–72.9	0.0–84.0	17.0–56.5	3.1–84.0	5.5–41.5	0.0–60.0	0.0–37.1
Skew	0.6	1.7	0.7	2.1	0.9	1.9	1.4
Kurtosis	0.0	3.8	–0.7	5.5	0.6	4.6	1.4
Refused Umbrella							
Mean	41.3	19.7	33.2	20.1	19.6	26.4	9.1
SD	14.5	13.4	9.2	11.6	10.8	20.4	7.6
Median	39.1	17.6	31.6	19.2	18.4	21.2	7.5
Range	16.6–98.2	0.0–67.5	15.7–55.2	3.7–54.0	1.3–53.7	7.0–67.5	0.0–41.4
Skew	1.1	1.0	0.6	0.9	0.8	1.2	2.3
Kurtosis	2.0	0.9	0.1	0.4	1.3	0.0	7.0
Cat Rescue							
Mean	39.8	16.9	30.3	18.4	15.7	17.4	7.8
SD	14.3	12.3	10.5	13.9	7.6	10.9	4.7
Median	39.5	14.2	28.2	14.7	15.7	14.3	7.2
Range	13.3–100.0	0.0–93.8	18.4–57.7	3.6–93.8	4.0–35.7	5.9–41.3	0.0–20.0
Skew	0.9	2.0	0.9	2.8	0.5	1.0	0.8
Kurtosis	0.4	7.7	0.4	11.3	0.0	0.2	0.8
Cinderella							
Mean	24.7	14.1	23.1	13.5	14.1	18.0	8.9
SD	10.0	9.1	8.3	7.8	6.1	13.8	7.6
Median	23.6	12.9	21.8	12.3	14.1	14.7	6.7
Range	3.4–72.0	0.4–62.5	14.1–29.7	3.5–47.5	2.6–32.0	5.2–62.5	0.4–45.0
Skew	1.4	1.7	1.0	1.7	0.5	2.3	3.0
Kurtosis	3.5	4.9	0.4	5.2	0.5	6.6	11.7
Sandwich							
Mean	40.5	24.1	35.7	28.4	21.4	21.9	13.7
SD	16.6	20.1	12.1	26.4	15.6	12.5	8.8
Median	39.4	18.9	36.8	18.9	16.6	20.6	11.5
Range	8.6–114.0	0.0–156.0	16.6–60.0	3.1–156.0	3.6–65.0	3.8–50.0	0.0–38.2
Skew	1.3	2.8	0.2	2.8	1.5	0.8	0.8
Kurtosis	4.3	13.2	–0.9	9.6	1.6	0.1	0.4

Supplemental Appendix B: Progressive Aphasia

Normative data of AphasiaBank controls and persons with primary progressive aphasia for accurate/complete main concept production

	Controls	PPA	LVPPA	NFVPPA
Broken Window				
Mean	5.1	1.8	2.0	1.7
SD	1.6	2.0	2.4	1.4
Median	5.0	1.0	1.0	1.5
Range	1.0–8.0	0.0–7.0	0.0–7.0	0.0–4.0
Skew	–0.3	1.5	1.3	0.9
Kurtosis	–0.4	1.8	1.0	1.3
Refused Umbrella				
Mean	7.2	3.9	4.4	3.3
SD	1.6	2.6	2.8	2.3
Median	7.0	3.0	4.0	3.5
Range	1.0–10.0	0.0–9.0	1.0–9.0	0.0–7.0
Skew	–1.1	0.6	0.4	0.2
Kurtosis	2.0	–0.6	–1.3	1.0
Cat Rescue				
Mean	6.2	2.5	2.6	2.3
SD	1.5	1.7	2.2	0.8
Median	6.0	2.0	2.5	2.5
Range	2.0–10.0	0.0–6.0	0.0–6.0	1.0–3.0
Skew	–0.3	0.5	0.3	–0.9
Kurtosis	0.0	–0.1	–1.3	–0.3
Cinderella				
Mean	15.7	4.2	3.4	6.3
SD	6.2	5.2	4.6	6.1
Median	17.0	2.0	2.0	6.0
Range	2.0–30.0	0.0–17.0	0.0–16.0	0.0–17.0
Skew	–0.3	1.7	2.7	1.1
Kurtosis	–0.4	2.3	7.6	1.6
Sandwich				
Mean	5.2	1.8	1.8	1.7
SD	1.9	1.5	1.8	1.2
Median	6.0	2.0	1.5	1.5
Range	1.0–9.0	0.0–5.0	0.0–5.0	0.0–3.0
Skew	–0.4	0.6	0.7	–0.1
Kurtosis	–0.3	–0.2	–0.6	–1.6

Normative data of AphasiaBank controls and persons with primary progressive aphasia for efficiency of accurate/complete main concept production

	Controls	PPA	LVPPA	NFVPPA
Broken Window				
Mean	9.0	3.5	3.5	4.0

SD	4.1	4.4	4.8	4.3
Median	8.9	1.9	1.6	2.7
Range	1.8–21.8	0.0–14.3	0.0–14.3	0.0–11.8
Skew	0.5	1.5	1.7	1.4
Kurtosis	0.3	1.3	2.1	1.9
Refused Umbrella				
Mean	11.2	11.2	6.6	5.6
SD	4.0	7.8	9.7	4.6
Median	11.0	3.2	2.6	5.4
Range	1.8–24.7	0.0–33.3	1.2–33.3	0.0–11.5
Skew	0.4	3.0	2.8	0.1
Kurtosis	1.1	10.2	8.2	–1.9
Cat Rescue				
Mean	9.1	3.3	3.6	3.1
SD	3.5	4.9	6.2	2.5
Median	9.1	1.7	1.4	2.1
Range	3.0–17.0	0.0–20.7	0.0–20.7	0.6–6.7
Skew	0.5	3.1	2.8	0.8
Kurtosis	0.1	11.1	8.4	–1.5
Cinderella				
Mean	5.5	1.4	1.3	1.9
SD	2.1	1.5	1.5	1.6
Median	5.4	1.1	1.0	1.8
Range	1.3–12.3	0.0–5.3	0.0–5.3	0.0–4.4
Skew	0.5	1.5	2.5	0.5
Kurtosis	0.2	2.0	7.0	0.0
Sandwich				
Mean	11.0	3.8	3.3	4.6
SD	5.4	5.6	5.7	6.3
Median	10.9	1.9	1.9	1.8
Range	0.6–26.7	0.0–19.0	0.0–19.0	0.0–16.7
Skew	0.4	2.2	2.8	1.9
Kurtosis	0.2	4.1	8.2	3.5

Normative data of AphasiaBank controls and persons with primary progressive aphasia for core lexicon production

	Controls	PPA	LVPPA	NFVPPA
Broken Window				
Mean	18.8	12.2	12.4	11.5
SD	2.6	4.3	4.7	4.1
Median	19.0	12.0	11.5	12.0
Range	12.0–24.0	5.0–21.0	6.0–21.0	5.0–16.0
Skew	–0.6	0.1	0.5	–0.7
Kurtosis	0.4	–0.3	–0.4	–0.3

Refused Umbrella				
Mean	25.7	17.1	19.9	13.3
SD	3.1	6.2	6.5	2.9
Median	26.0	17.0	20.5	12.0
Range	17.0–32.0	10.0–29.0	10.0–29.0	11.0–17.0
Skew	–0.4	0.6	–0.3	0.9
Kurtosis	0.2	–1.0	–1.1	–1.9
Cat Rescue				
Mean	26.1	17.8	20.0	14.8
SD	3.0	6.3	6.9	4.2
Median	26.0	18.0	21.5	15.0
Range	16.0–33.0	8.0–29.0	9.0–29.0	8.0–20.0
Skew	–0.3	0.2	–0.5	–0.6
Kurtosis	0.5	–0.8	–0.9	0.7
Cinderella				
Mean	65.0	31.3	32.3	31.2
SD	17.8	12.9	12.7	15.0
Median	70.0	32.0	32.5	34.0
Range	4.0–90.0	8.0–52.0	10.0–52.0	8.0–50.0
Skew	–1.3	–0.2	–0.2	–0.5
Kurtosis	1.7	–0.6	–0.2	–0.2
Sandwich				
Mean	18.6	13.2	13.6	12.5
SD	2.8	3.5	4.3	2.3
Median	19.0	13.0	13.5	12.0
Range	12.0–25.0	5.0–20.0	5.0–20.0	10.0–16.0
Skew	–0.1	–0.3	–0.5	0.6
Kurtosis	0.0	0.9	0.6	–0.8

Normative data of AphasiaBank controls and persons with primary progressive aphasia for efficiency of core lexicon production

	Controls	PPA	LVPPA	NFVPPA
Broken Window				
Mean	33.1	23.3	21.4	27.8
SD	12.6	23.1	22.9	26.8
Median	32.1	13.6	12.0	18.4
Range	11.9–65.7	4.1–81.0	6.3–81.0	4.1–76.5
Skew	0.5	1.8	2.3	1.5
Kurtosis	–0.1	2.6	5.8	2.0
Refused Umbrella				
Mean	39.7	23.4	25.1	21.7
SD	13.0	21.3	25.7	15.5
Median	39.1	16.8	16.9	14.2
Range	16.6–90.0	8.7–95.8	10.5–95.8	8.7–42.3

Skew	0.9	2.8	2.8	0.8
Kurtosis	2.1	8.8	8.3	-1.9
Cat Rescue				
Mean	38.3	20.3	21.5	18.7
SD	13.9	17.1	20.3	13.6
Median	37.9	14.8	14.0	14.0
Range	13.3–100.0	5.0–75.9	7.7–75.9	5.0–37.7
Skew	1.2	2.4	2.6	0.7
Kurtosis	3.3	6.9	7.1	-1.6
Cinderella				
Mean	25.2	13.3	13.2	11.5
SD	10.6	5.8	6.1	3.7
Median	24.2	10.6	10.6	11.7
Range	7.9–72.0	5.8–24.4	6.8–22.6	5.8–16.2
Skew	1.4	0.6	0.5	-0.4
Kurtosis	3.4	-0.9	-1.7	-0.5
Sandwich				
Mean	38.0	25.8	25.3	27.8
SD	16.1	24.9	26.6	26.4
Median	38.7	14.9	14.1	17.8
Range	8.6–92.7	5.7–85.7	5.7–85.7	9.3–77.8
Skew	0.6	1.6	1.8	1.8
Kurtosis	1.1	1.6	2.3	3.2

Supplemental Appendix C: Treatment Response

Mean and standard deviation of pre/post difference scores in 15 persons with chronic stroke-induced aphasia

	AC main concepts	AC efficiency	Core Lexicon	Core Lexicon efficiency
Mean	1.1	0.5	2.3	-0.6
SD	1.9	1.7	6.4	8.7