

Language Background

Languages*

Language	Mongolic		Tungusic
	Western Buriat	Tsongol Buriat	Ewen
speakers	< 50,000**	20,000	7,000
Spoken in	Buryatia, Russia	Selenge (S. Buryatia)	Eastern Siberia
Vowel harmony	/u ə o/ vs /ʊ a ɔ/ (/i/-neutral)		/i u ə o/ vs. /i ʊ a ɔ/

*See the Appendix for the endangered status of most Altaic languages.
**An estimated number of the ethnic group (Janhunen & Salminen 2000)

Consultants

Language	WB	TB	Ewen
consultant	B. B. Borisovich	L. D. Tuvajeva	J. S. Val'dju
gender	male	female	female
birth year	1943	1950	1940
dialect	Ekhirit-Bulagat	Tsongol-Sartul	Eastern Ewen (Anadyr, Magadan)
fieldwork by ASK***	Ust'Ordynskij Jan 2007	Tashir Aug 2007	Khabarovsk Feb 2006

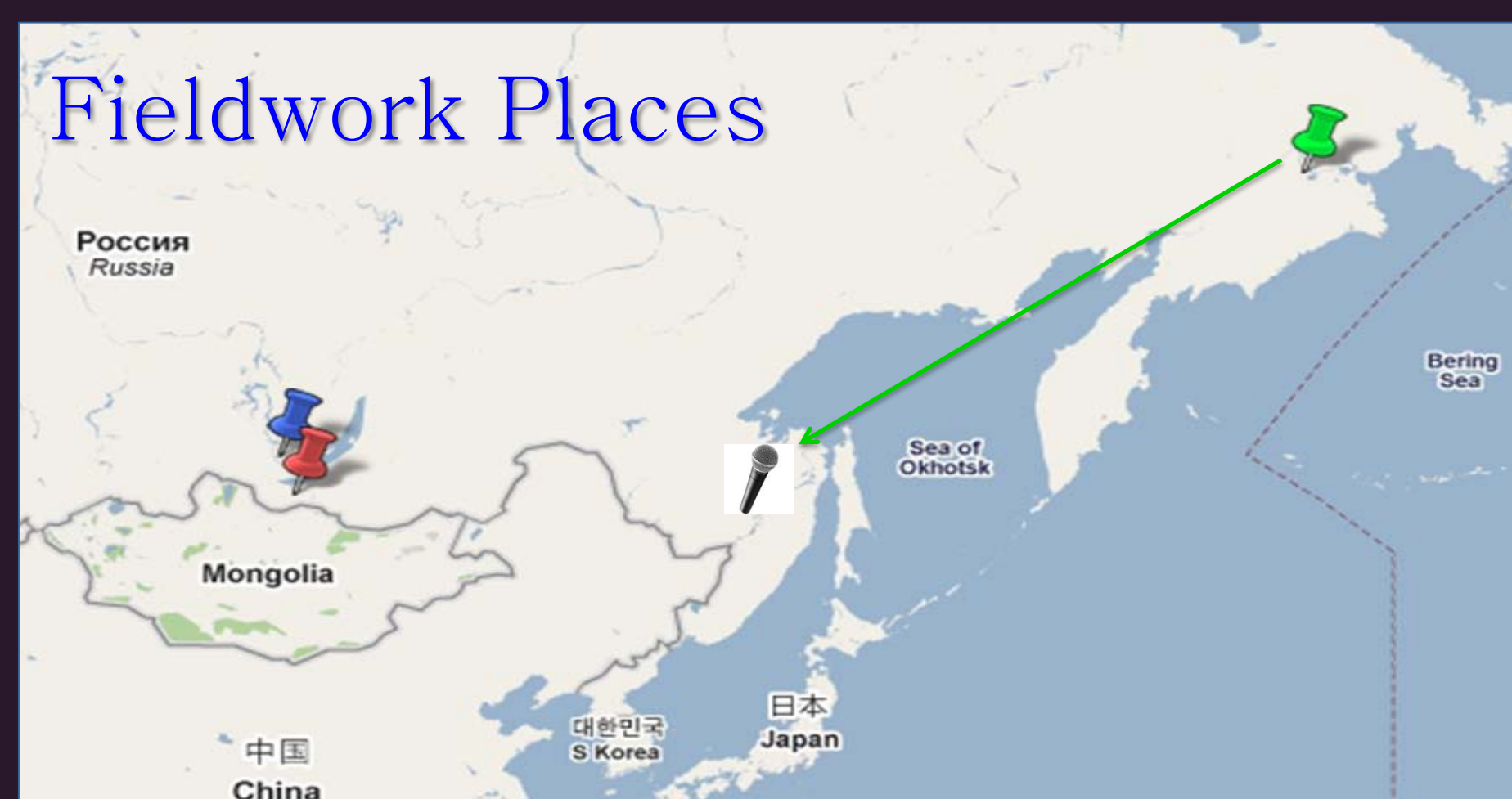
***Altaic Society of Korea (<http://altaireal.snu.ac.kr>)

Goals (and Motivations)

- Endangered status of most Altaic languages
- No consensus on the nature of vowel harmony in Altaic
- 1. To confirm acoustically that Buriat and Ewen have a vowel system based on tongue root (TR) contrast**
- Lack of acoustic/typological study of TR harmony in Altaic
- 2. To compare the acoustic correlates of Altaic TR contrast with those of West-African languages**

Recording and Processing

- Each word recorded twice in citation forms (Words listed in the ASK questionnaire)
- Transcribed by the authors in consultation with Bosson 1962 and Robbek 2005
- Only short vowels in initial syllables segmented (Tokens #: WB 1,271; TB 1,233; Ewen 899)
- Measured at the middle of each vowel phone (Hertz 1991), using Praat

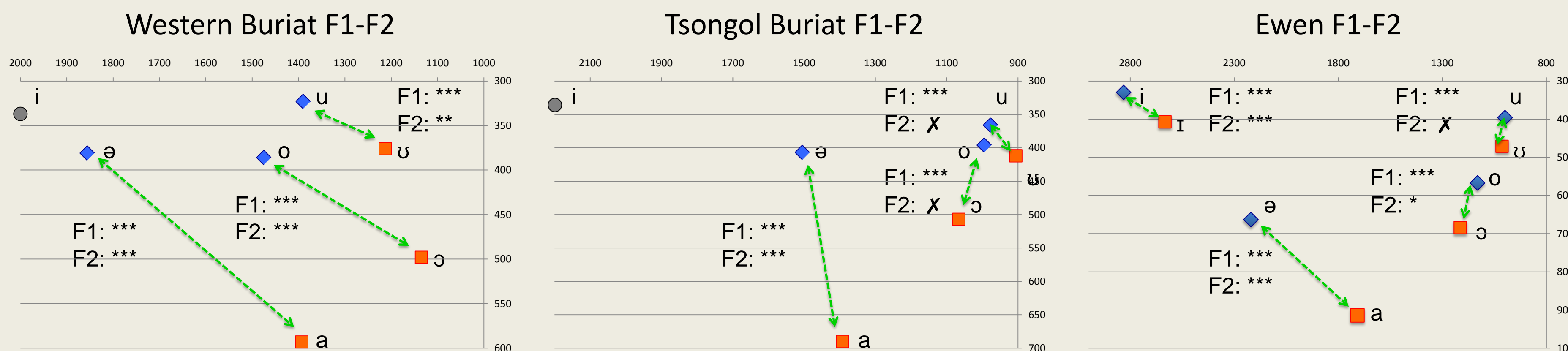


Results

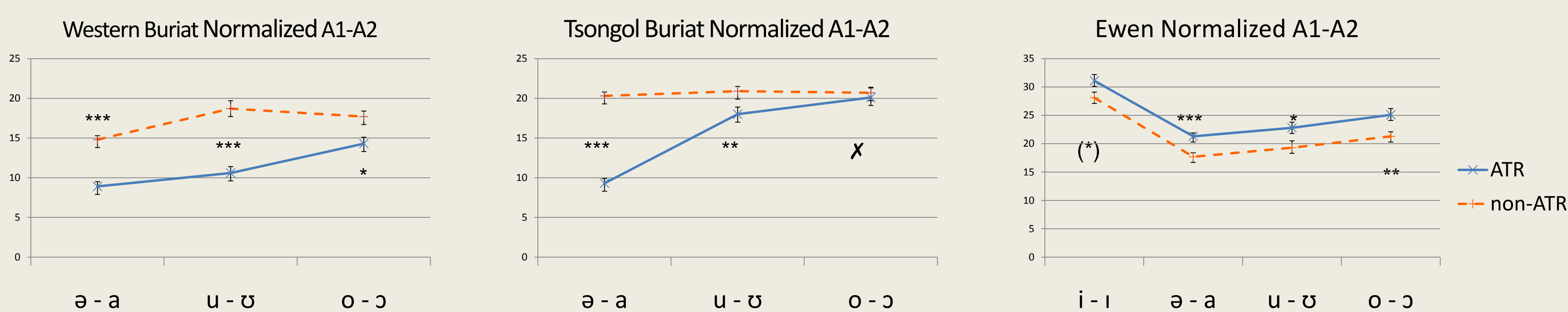
- Overall results: each pair of vowels compared using one-way ANOVA
- Note +: ATR greater, -: non-ATR greater, x/y: significant difference in x pair(s) out of y pairs

	F0	F1	F2	F3	A1	A2	A3	B1	B2	B3	H1	H2	H1-H2	H1-A1	H1-A2	H1-A3	NA1-A2
WB	+2/3	-3/3	+3/3		+3/3	-3/3		-3/3		+1/3	+3/3	+3/3		-1/3	+3/3		-3/3
TB	+3/3	-3/3		-1/3		-3/3	-3/3	-2/3	+2/3		+3/3	+2/3			+3/3	+3/3	-2/3
Ewen	+2/4	-4/4						-3/4	-2/4						+1/4		+3/4

- F1 & F2 (***: p<.001, **: p<.01, *: p<.05, x: p>.05)



- The Normalized A1-A2: calculated following Fulop et al. 1998 (***: p<.001, **: p<.01, *: p<.05, x: p>.05)



Acoustic Studies of West-African

- Q. What is the acoustic correlates of TR feature in West-African languages?
- 1. F1:** the most reliable acoustic cue of TR feature (Akan, Hess 1992; Degema, Fulop et al. 1998; Maa, Guion et al. 2004; Yoruba, Przedziecki 2005)
- 2. Normalized A1-A2:** spectral tilts reflecting different phonation types enhancing the distinctiveness of the vowels (Degema, Fulop et al. 1998; Maa, Guion et al. 2004)
- 3. B1 or ΔB1** ('normalized bandwidth', Akan, Hess 1992; Yoruba, Przedziecki 2005; Ikposo, Kinande, uBwisi, and so on, Starwalt 2008)

F1: ATR < non-ATR
normalized A1-A2: ATR > non-ATR
B1 (or ΔB1): ATR < non-ATR

Discussion

- Summary of results – Which vowels have significantly greater values?

	F1	N. A1-A2	Comparison
Buriat	non-ATR	non-ATR	Opposite to W.A. lgs
Ewen	non-ATR	ATR	Harmonious with W.A. lgs

- Harmonic Feature
 - The F1-F2 distributions confirm that **Buriat & Ewen are TR languages.**
 - They also support the X-ray studies: Buriat (Buraeva 1959) & Ewen (Novikova 1960)
- Acoustic correlate(s)
 - Both **F1** and **n. A1-A2**: reliable cues of TR contrast.
 - Why does Buriat have the opposite direction in terms of the normalized A1-A2?
 - Might be a systematic difference between Mongolic and Tungusic/West-African lgs.
 - Or the normalized A1-A2 does not reflect the TR mechanism in TR lgs (cf. Starwalt 2008).
- Ongoing merger /o/ > /u/ in TB vs. retention of /o/ in WB:
 - TB, a Mongolian dialect indeed (Svantesson et al. 2005), may have been affected by Eastern Buriat

Further Study

- More speakers, more languages, more control over the data
- Other possible acoustic cues: e.g., ΔB1 & Center of Gravity (Starwalt 2008)
- Articulation
 - MRI (Tiede 1996)
 - laryngoscopic study (Edmondson & Esling 2006)
- Effect of prosody (stress, length, position)

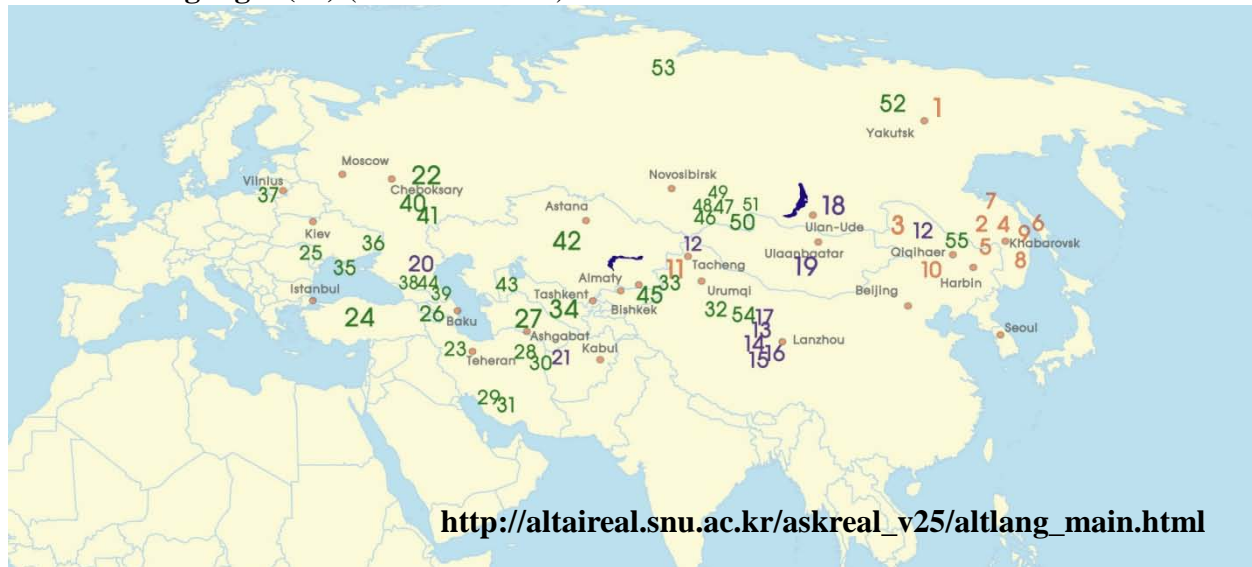
Questions or Comments?

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* Appendix (Altaic languages and their endangered status) and References are on a separate sheet.

Appendix

▪ **Altaic languages (55)** (Kim et al. 2008)



Tungusic (11)	Mongolic (10)	Turkic (34)
1. Ewen	12. Dagur	22. Chuvash
2. Ewenki(Oroqen)	13. Monguor	23. Khalaj
3. Solon	14. Bonan	24. Turkish
4. Negidal	15. Kangjia	25. Gagauz
5. Nanai	16. Dongxiang	26. Azerbaijani
6. Uilta(Orok)	17. East Yugur	27. Turkmen
7. Ulchi	18. Buriat	28. Khorasan Turkish
8. Udihe(Udege)	19. Mongolian	29. Qashqa'i
9. Orochi	20. Kalmyk-Oirat	30. Afshar
10. Manchu	21. Moghol	31. Anynalu
11. Sibe		32. Salar
		33. Uyghur
		34. Uzbek
		35. Crimean Tatar
		36. Urum
		37. Karaim
		38. Karachai-Balkar
		39. Kumyk
		40. Tatar
		41. Bashkir
		42. Kazakh
		43. Karakalpak
		44. Nogai
		45. Kirghiz
		46. Altai
		47. Khakas
		48. Shor
		49. Chulyim Turkish
		50. Tuvan
		51. Tofa
		52. Yakut
		53. Dolgan
		54. West Yugur
		55. Fuyu Kirghiz

▪ **Endangered Altaic languages** (Janhunen and Salminen 2000; Moseley 2010)

	Tungusic	Mongolic	Turkic
extinct (since the 1950s)	Arman Ewen, Ongkor Solon, Udihe (Kyakala)		Tuvan (Soyot)
critically endangered	Manchu, Negidal, Orochi, Oroqen, Ulcha, Udihe, Uilta, Nanai (Hejen, Kili, Kilen)	Manchurian Ölöt (Oirat), East Yugur, Kangjia	Chulyim Tatar, Tofa, Manchurian Kirgiz, Saryg Yugur, Uyghur Uryangkhay (almost extinct)
severely endangered	Ewen, Ewenki, Nanai, Sibe	Western Buriat, Mongghul	Baraba Tatar, Altai Uryangkhay, Khövsgöl Uryangkhay, Tsaatan (=Dukha), Northern Altai, Teleut, Shor, Ili Turk, Crimean Tatar, Karaim
definitely endangered	Solon	Khamnigan Mongol, Dagur, Kalmyk-Oirat, Mangghuer, Bonan, Ordos	Dolgan, Khakas, Siberian Tatar, Southern Altai, Nogai,
vulnerable		Santa, Eastern Buriat	Bashkir, Tuvan, Yakut, Khorasani Turkish, Salar, Kumyk, Chuvash, Karachai-Balkar

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