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Call repertoire:

Calls in BH call type

Calls in BZ call type

[Calls in BZ0 call category](#)

[Calls in BZ01 and BZ20 call categories](#)

Calls in Chtcht call type

Calls in GR call type

[Calls in GR0 and GR01 call categories](#)

[Calls in GR20 and GR22 call categories](#)

[Calls in GR23 and GR25 call categories](#)

Calls in HN call type

[Calls in HN0, HN20, HN21, and HN22 call categories](#)

Calls in HP call type

[Calls in HP0 call category](#)

[Calls in HP01 call category](#)

Calls in HRP call type

[Calls in HRP0 call category](#)

[Calls in HRP02 call category](#)

[Calls in HRP1 call category](#)

[Calls in HRP2 call category \(HRP2C-HRP2E\)](#)

[Calls in HRP2 \(HRP2A-HRP2B\) and HRP3 call categories](#)

[Calls in HRP4 call category](#)

[Calls in HRP20 call category](#)

[Calls in HRP 21 call category \(HRP21A-HRP21E\)](#)

[Calls in HRP21 \(HRP21F\) and HRP26 call categories](#)

[Calls in HRP22, HRP23, and HRP24 call categories](#)

Calls in KLP call type

[Calls in KLP0 call category](#)

[Calls in KLP01 and KLP20 call categories](#)

Calls in KNP call type

[Calls in KNP0 call category](#)

[Calls in KNP1, KNP2, and KNP20 call categories](#)

[Calls in KNP21 call category](#)

Calls in KWP call type

[Calls in KWP0 call category](#)

[Calls in KWP1 and KWP3 call categories](#)

[Calls in KWP2 and KWP5 call categories](#)

[Calls in KWP20 and KWP4 call categories](#)

Calls in LR call type

[Calls in LR0 and LR20 call categories](#)

[Calls in LR1 call category](#)

[Calls in LR2, LR3, and LR4 call categories](#)

Call in M call type

[Calls in M0, M01 and M21 call categories](#)

[Calls in M20 call category](#)

[Calls in Q call type](#)

Calls in SPS call type

[Calls in SPS0 and SPS01 call categories](#)

[Calls in SPS2 and SPS21 call categories](#)

[Calls in TL call type](#)

Calls in W call type

[Calls in W1, W2, and W4 call categories](#)

[Calls in W3 and W5 call categories](#)

[Calls in W6 and W7 call categories](#)

[Calls in WHP call type](#)

Calls in Z call type

[Calls in Z0 call category](#)

[Calls in Z01 call category](#)

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Calls in the BH call type: [wav. file call key](#)

Calls in the BZ call type: [wav. file call key](#)

Calls in the GR call type: [wav. file call key](#)

Calls in the HN call type: [wav. file call key](#)

Calls in the HP call type: [wav. file call key](#)

Calls in the HRP call type:

[Calls in the HRP0 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

[Calls in the HRP02 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

[Calls in the HRP1 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

[Calls in the HRP2 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

[Calls in the HRP3 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

[Calls in the HRP4 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)

3. [Measurement key](#)

Calls in the [HRP21 call category \(wav. file\)](#) and [HRP 26 call category \(wav. file\)](#)

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

Calls in the [HRP22 \(wav. file\)](#), [HRP23.wav. file\)](#) and [HRP24 \(wav. file\)](#) call categories

1. [Frequency parameters](#)
2. [Length parameters](#)
3. [Measurement key](#)

Calls in the KLP call type: [wav. file call key](#)

Calls in the KNP call type:

Calls in the [KNP0.wav. file\)](#) and [KNP21.wav. file\)](#) call categories

1. [Frequency and length of extensions](#)
2. [Frequency and length of fundamental frequency of call body](#)

Calls in the [KNP1.wav. file\)](#), [KNP2 \(wav. file\)](#) and [KNP20.wav. file\)](#) call categories: [call key](#)

Calls in the KWP call type:

Calls in the [KWP0.wav. file\)](#), [KWP3.wav. file\)](#), and [KWP20.wav. file\)](#) call categories: [call key](#)

Calls in the [KWP1.wav. file\)](#), [KWP2 \(wav. file\)](#), [KWP4.wav. file\)](#), and [KWP5 \(wav. file\)](#) call categories: [call key](#)

Calls in the LR call type: [wav. file call key](#)

Calls in the M call type: [wav. file call key](#)

Calls in the Q call type: [wav. file call key](#)

Calls in the SPS call type: [wav. file call key](#)

Calls in the TL call type: [wav. file call key](#)

Calls in W call type:

Calls in the W1 ([wav. file](#)) and W7 ([wav. file](#)) call category: [call key](#)

Calls in the W2 ([wav. file](#)) and W4 ([wav. file](#)) call category: [call key](#)

Calls in the W3 call category: [wav. file call key](#)

Calls in the W5 ([wav. file](#)) and W6 ([wav. file](#)) call category: [call key](#)

Calls in the WHP call type: [wav. file call key](#)

Calls in the Z call type: [wav. file call key](#)

APPENDIX C: Linear predictive coding

Fig. C-1

APPENDIX D: Catalogue of LPC coefficients for HP01 calls of individuals in this study

FIGS. D-1 - D-28:

Fig. D-1

Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficient 1 plotted

Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficient 1 plotted

Fig. D-2

Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficient 1 plotted (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

Fig. D-3

Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficient 1 plotted

Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficient 1 plotted

Fig. D-4

Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficient 1 plotted

Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficient 1 plotted

Fig. D-5

Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficients 2-4 plotted

Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficients 2-4 plotted

Fig. D-6

Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficients 2-4 plotted (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

Fig. D-7

Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 2-4 plotted

Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficients 2-4 plotted

Fig. D-8

Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficients 2-4 plotted

Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficients 2-4 plotted

Fig. D-9

Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficients 5-7 plotted

[Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficients 5-7 plotted](#)

[Fig. D-10](#)

[Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficients 5-7 plotted](#) (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

[Fig. D-11](#)

[Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 5-7 plotted](#)

[Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficients 5-7 plotted](#)

[Fig. D-12](#)

[Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficients 5-7 plotted](#)

[Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficients 5-7 plotted](#)

[Fig. D-13](#)

[Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficients 8-9 plotted](#)

[Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficients 8-9 plotted](#)

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[Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficients 8-9 plotted](#) (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

[Fig. D-15](#)

[Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 8-9 plotted](#)

[Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficients 8-9 plotted](#)

[Fig. D-16](#)

[Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficients 8-9 plotted](#)

[Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficients 8-9 plotted](#)

[Fig. D-17](#)

[Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficients 10-12 plotted](#)

[Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficients 10-12 plotted](#)

[Fig. D-18](#)

[Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficients 10-12 plotted](#) (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

[Fig. D-19](#)

[Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 10-12 plotted](#)

Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficients 10-12 plotted

Fig. D-20

Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficients 10-12 plotted

Fig. D-21

Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficients 13-14 plotted

Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficients 13-14 plotted

Fig. D-22

Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficients 13-14 plotted (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

Fig. D-23

Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 13-14 plotted

Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficients 13-14 plotted

Fig. D-24

Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficients 13-14 plotted

Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficients 13-14 plotted

Fig. D-25

Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficient 15 plotted

Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficient 15 plotted

Fig. D-26

Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficient 15 plotted (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

Fig. D-27

Fig. A-B: 2 HP01 calls given by the SF1A #2 male; LPC coefficient 15 plotted

Fig. C-D: 2 HP01 calls given by the QG male; LPC coefficient 15 plotted

Fig. D-28

Fig. A-B: 2 HP01 calls given by the SF1A #1 female; LPC coefficient 15 plotted

Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficient 15 plotted

FIGS. D-29 - D-35:

Fig. D-29

Fig. A, Fig. C: 2 HP01 calls given by the EF #3 male; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. E, Fig. G: 2 HP01 calls given by the EM male; First derivative of LPC coefficient 10-12

Fig. F: PCA of first derivative of LPC coefficient 10-12 shown in Fig. E

Fig. H: PCA of first derivative of LPC coefficient 10-12 shown in Fig. G

Fig. D-30

Fig. A, Fig. C: 2 HP01 calls given by the EF #3 female; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. D-31

Fig. A, Fig. C: 2 HP01 calls given by the SF2A male; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. E, Fig. G: 2 HP01 calls given by the QG male; First derivative of LPC coefficient 10-12

Fig. F: PCA of first derivative of LPC coefficient 10-12 shown in Fig. E

Fig. H: PCA of first derivative of LPC coefficient 10-12 shown in Fig. G

Fig. D-32

Fig. A, Fig. C: 2 HP01 calls given by the SF1A #2 male; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. E, Fig. G: 2 HP01 calls given by the SF2B male; First derivative of LPC coefficient 10-12

Fig. F: PCA of first derivative of LPC coefficient 10-12 shown in Fig. E

Fig. H: PCA of first derivative of LPC coefficient 10-12 shown in Fig. G

Fig. D-33

Fig. A, Fig. C: 2 HP01 calls given by the SF1A #3 male; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. E, Fig. G: 2 HP01 calls given by the SF1A #1 male; First derivative of LPC coefficient 10-12

Fig. F: PCA of first derivative of LPC coefficient 10-12 shown in Fig. E

Fig. H: PCA of first derivative of LPC coefficient 10-12 shown in Fig. G

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Fig. A, Fig. C: 2 HP01 calls given by the QG female; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. E, Fig. G: 2 HP01 calls given by the SF2B female; First derivative of LPC coefficient 10-12

Fig. F: PCA of first derivative of LPC coefficient 10-12 shown in Fig. E

Fig. H: PCA of first derivative of LPC coefficient 10-12 shown in Fig. G

Fig. D-35

Fig. A, Fig. C: 2 HP01 calls given by the SF1A #1 female; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

Fig. E, Fig. G: 2 HP01 calls given by the SF2A female; First derivative of LPC coefficient 10-12

Fig. F: PCA of first derivative of LPC coefficient 10-12 shown in Fig. E

Fig. H: PCA of first derivative of LPC coefficient 10-12 shown in Fig. G

FIGS. D-36 - D-38:

Fig. D-36

Fig. A-B: 2 HP01 calls given by the SF1A #2 female; LPC coefficients 5-7 plotted

Fig. C-D: 2 HP01 calls given by the SF1A #2 female; LPC coefficients 8-9 plotted

Fig. D-37

Fig. A-B: 2 HP01 calls given by the SF1A #2 female; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF1A #2 female; LPC coefficients 13-14 plotted

Fig. D-38

Fig. A, Fig. C: 2 HP01 calls given by the SF1A #2 female; First derivative of LPC coefficient 10-12

Fig. B: PCA of first derivative of LPC coefficient 10-12 shown in Fig. A

Fig. D: PCA of first derivative of LPC coefficient 10-12 shown in Fig. C

FIGS. D-39 - D-46:

Fig. D-39

Fig. A-B: 2 HP01 calls given by the EF #3 male; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the EM male; LPC coefficients 10-12 plotted

Fig. D-40

Fig. A-B: 2 HP01 calls given by the EF #3 female; LPC coefficients 10-12 plotted (There were no quality recordings from the EM female thus comparisons between eastern females were not possible)

Fig. D-41

Fig. A-B: 2 HP01 calls given by the SF2A male; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 10-12 plotted

Fig. D-42

Fig. A-B: 2 HP01 calls given by the QG male; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF2B male; LPC coefficients 10-12 plotted

Fig. D-43

Fig. A-B: 2 HP01 calls given by the SF2A male; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF1A #2 male; LPC coefficients 10-12 plotted

Fig. D-44

Fig. A-B: 2 HP01 calls given by the SF1A #3 male; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF1A #1 male; LPC coefficients 10-12 plotted

Fig. D-45

Fig. A-B: 2 HP01 calls given by the QG female; LPC coefficients 10-12 plotted

Fig. C-D: 2 HP01 calls given by the SF2B female; LPC coefficients 10-12 plotted

Fig. D-46

Fig. A-B: 2 HP01 calls given by the SF1A #2 female; LPC coefficients 10-12 plotted