

Learning to recognize unfamiliar talkers from the word-level dynamics of visual speech

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Abstract

Visual speech dynamics are critical for understanding how we learn to recognize unfamiliar talkers from the word-level dynamics of visual speech. We investigate how visual speech dynamics influence learning to recognize unfamiliar talkers from the word-level dynamics of visual speech. We investigate how visual speech dynamics influence learning to recognize unfamiliar talkers from the word-level dynamics of visual speech. We investigate how visual speech dynamics influence learning to recognize unfamiliar talkers from the word-level dynamics of visual speech.

Index Terms: visual speech; word-level dynamics; learning; recognition

1. Introduction

Visual speech dynamics are critical for understanding how we learn to recognize unfamiliar talkers from the word-level dynamics of visual speech. We investigate how visual speech dynamics influence learning to recognize unfamiliar talkers from the word-level dynamics of visual speech. We investigate how visual speech dynamics influence learning to recognize unfamiliar talkers from the word-level dynamics of visual speech.

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e ea a f a eec , ae eda e ee a
 e aae f face e ee a f a a e e .
 F e e , e c e e ee be a fac a
 d a c f a c b e e ec g f
 fa a ea e , ad f e g c d ae [32]-
 [35], b d e ee c b e ea g ec g e
 fa a ea e , e.g., [30], [36]. S d e e a g e e
 ee g f aed face ad e ea g f
 fa a face a e e ab d ced be ef [37]-[41].
 T e e de a e , ee , e ed e e d a c
 g a e a e ed f fa a face , b a e e e
 ee g e f g a a face e e a .
 O ece a c a e ged e a b
 de a g a e a e e e a f d a c fac a
 g a e f a g ca be f ed a d f fa a
 ea e [2]. P e e g - g d a f a g
 face e g e e ce d g a g a d e , a c a
 ea ed ec g e ea e a d f ea e f
 ede e . T e e - g d a ee a ed
 c f g a a d e , e a g a a a c e de .
 C ca , e f ed e e e a a ed a c a
 ec g e ee ea e a f e ea ce . O e
 de ae a a c a ca ea ec g e e
 de f fa a ea e f e e d ce
 e a g , eeb e ab g ab ac de
 e e e a a a e ec g f e e ea e
 de e de f e g c c e f e eec .
 I e e e d , ef e e ed a c a ab
 ea ec g e fa a ea e f ed a c f
 e a eec . U e e e d , - g
 d a f ea e e g aed d , a e
 a e e ce , ee ee ed . Se e ce de ee
 ge a e f a e a aed d . L ge
 a e a f be e ea g f a d ce [42], [43].
 I add e g , e e ce a d aed d a d ffe
 e e e f d ca e e ca f ab [3].
 Se e ce de e e f a ab e a e -
 ec f c e c ea a f d d a eec d a d
 d , b a f a ab e g ba
 d c a e e ea a f d a d ea g a e .
 Lea g ec g e ea e f e e ce e ef ed e
 e e a e d g e a e - ec f c e c de a .
 W e ea g ec g e ea e f d , ee ,
 ee c de a e d ffe e ce e ea a f
 f e - e c de a . Lea g ec g e ea e f
 d d e ef e be e d ffc a ea g
 ec g e ea e f e e ce . L e e a f c
 d ffe e e f d ca e e e ce . d . W e
 ea g ec g e ea e b e a d ce f
 b e e f a e a ca de a be ef f eec
 e ce , be ef age e ee a e e d
 e a e e f a e a a e ad bee a ed ; e .
 aed d e e ce [3]. I d g
 e e ce , a c a a a e e ef e ea ed ec g e
 ea e f a g ba d ca e , c a e
 ea a f d ea g a e . I e e e d , e
 e ed e e a c a c d a ea ec g e
 ea e f e d ca e e e c ea a f
 eec d a d d .

2. Experiment

2.1. Participants

T e -f g a a e ea e f A e ca E g
 (f e e ; ea age = 20.25 ea) e ed a g age
 a e def c a c a ed . A ad a ea g a d
 (c ec ed -) a .

2.2. Materials

T e f e abc c a - e - c a
 E g d eac e e c ea ed . W d b e c a ed
 a a a e f e e . Eac d c ed fa e
 e ec b a . Se ee a c ed e a e age d
 f e e c (M = 93.71, M = 89.94; t(18) = 0.1, p = .92)[44].

T e - ee 3- d f ec c a e ee
 a ac ed e face fa a e a d a fe a e a e ea e f
 A e ca E g . S ea e face ee aed ga
 e f a e a d a ge g [45]. V de f e
 ea e d c g e e eed d a ee
 ec ded a .264 a 25 f a SONY EVI-HD7V ca e a .
 A d a ec ded a e a e a a 48 H
 a g ae , ga S e KSM44A c e . T c ea e
 e - g d a , e f ed a ac ed
 Ad be Af e Effec CS5 a d e f ed fa e - b - fa e a
 a c ec . T e ba ed a ee e ed
 a a ea a e aged c fg a (ee Fg e l), c ea ed b
 cac a g e ea ca f ed ef fa e fa
 e eed de f eac ea e . B a e ag g e d
 c fg a , a d ffe e ce e a e f e face a d
 e ace e f ed e ee aed , ee a [27], [46].

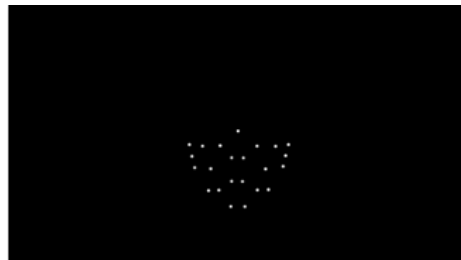


Fig e 1: Average point-light display configuration.

2.3. Procedure

Eac a c a a e ed d d a a d - a e a ed
 b . D ga a a g a e , a c a ece ed
 - g d a f d f e f e . T e a e
 e a e eed f b ea e . O eac a (ee Fg e 2),
 a c a a e - g d a be f e c g b
 b e e f d a ed a e (Anna, Owen). N
 d a ee ed . O ce a c a ad a eed , e
 e e a a g ec ec a e . If a c a
 ad e ded c ec , e e ad a e ce e
 e c ec a e . I de e de f acc ac , a c a
 ee e a a e a e - g d a aga ,
 a g e a e f e ea e ed de ea . N
 e e a c eed f ec d ee a . T e
 a fe e a e ef e e a ef a a c a .
 Eac a c a ece ed ee b c , eac c g f a
 a d ed ee a fa e d f eac ea e
 a e . I a , eac a c a a 120 - g d a (e . ,
 3 b c 10 d 2 ea e 2 ee a e a) .

I e b e e e a e , a c a e e e e d
 e a e e - g d a e a d d e d
 d g a g (familiar word condition) a e a e
 - g d a f e d (new word condition) e
 b e a e e a e . P e e a d e a c e e
 a d e d . O e a c a , a c a a e - g
 d a b e f e c g e a e f e e a e f
 . N d a e e e d . N f e e d b a c a g e .
 A g e f e a g a d c d a e , a
 c e b a a c e d a c a a .

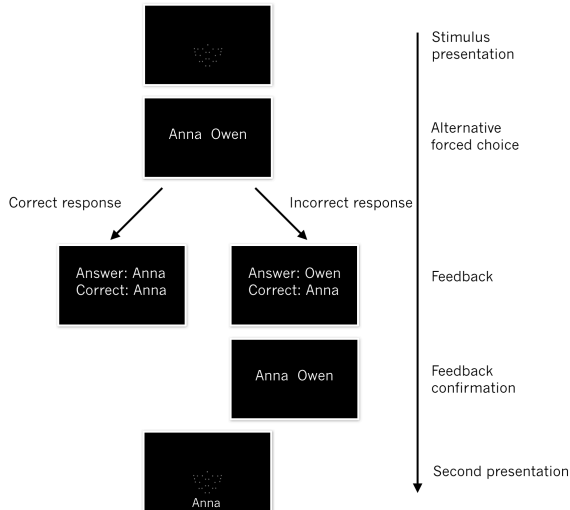


Figure 2: Schematic representation of a training trial. Test trials only consisted of the stimulus presentation followed by the alternative forced choice.

2.4. Results

2.4.1. Training

Figure 3: Histogram of participants' accuracy scores across training blocks. The x-axis is 'Proportion correct' (0.0 to 1.0) and the y-axis is 'Frequency' (0 to 10). Block 1 shows a distribution centered around 0.5. Block 2 shows a distribution centered around 0.6. Block 3 shows a distribution centered around 0.7.

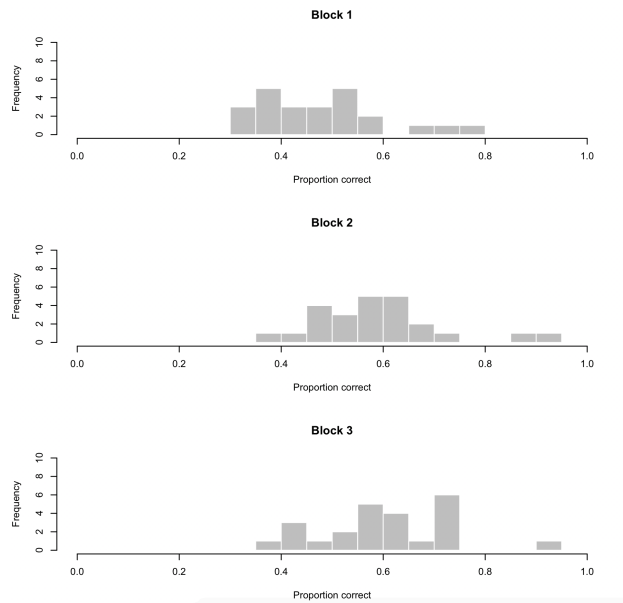


Figure 3: Histogram of participants' accuracy scores across training blocks.

2.4.2. Test

Figure 4: Histogram of participants' accuracy scores by test condition. The x-axis is 'Proportion correct' (0.0 to 1.0) and the y-axis is 'Frequency' (0 to 10). The 'Familiar words' histogram shows a distribution centered around 0.6. The 'New words' histogram shows a distribution centered around 0.5.

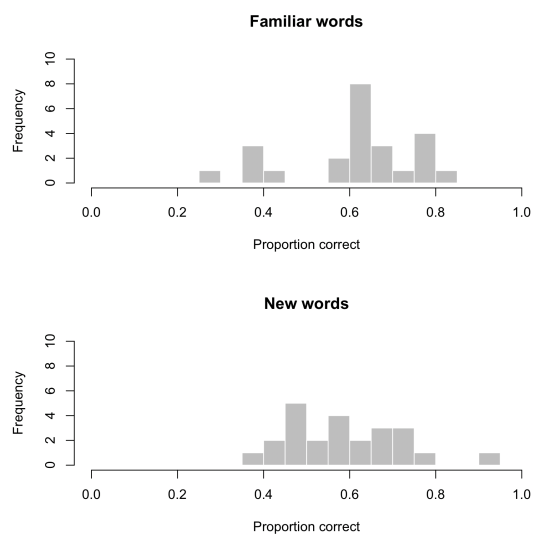


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3. Discussion

Sea e a e ea a f a eec . Te d a c f a eec de de f a a ca be ea ed [2] a d ed g-e e [1]. I e e e d , e a e e caed e e a ee g e b g ca a caed e d c f eec ffce f ee ea ec g e fa a ea e ba ed e fac a d a c g a e . We e e ded d d a d de ec ca f a eeded ac eab ac e ee a ffac a d a c g a e f fa a ea e , a a e ec g f ea e de e de f e g cc e f e eec . T ge e e e f d g c a e ge ea a e ee a f d a c fac a g a e , e a g f a ea e a , a a e e ec g f fa a ea e , e.g., [30], [36]. I ead, e a ee e ee a bec e ead a a abef ede e f fa a ea e , a e ace a d ec g .

T e e f e ee d c ca e ed f d g b de a g a a c a ca ea ec g e fa a ea e f d a c f a aed e - g d a f d d a d d c . Lea g ec g e ea e f e d a e a f e e ce c e a e d ff c e ca e, beca e d de e eec a e fa ea e a e e ce . Lea g f a d ce , f e a e, be ef f ge a e [42], [43]. I add , e e ce a de f a ab g ba ea e a b e ea ed ed c a c ea a f d a d ea g a e . I c a , ee g d eed ead f e e ce f ce a c a f c f e- e c de a e d c f eec d a d [3]. O e de ae a ee g ed a c f e d de ffce a e- ec fc e c de a ce a e a de e ee a f e ea e . T f d g d ea ce g a e de f a a ca be e ac ed f e d ffce ac - g d a a d e- a e eec a e f e a e ea e [47]. I e a , d de , add e de ce a ee e ea e f a b a ed f e a eec a e g-e e , a d a e e ee a f ed ba ed f a a e f e ec g f e ea e f e a eec de e de f g cc e .

O e a f d g a ea g f fac a d a c g a e f a g ca cc ed e : Pa c a ea ed ec g e ea e e ec d b c f e e a g e . T a , a c a a a g ec g ed ea e b e d ee a fa d , a b e ec d a e d , a eac a c a ed ee a . Lea g ec g e ea e f d a , ee , e d ff c a f e e ce . I e e ce , ea g a a ead c eed e f b c f e e (eac a c ed ee a fa - g d a e a) . I a e , ee , a e d e d ff e ed e a ec a e (e.g., ea e) , a d d a a a d ec c a . E e a e a abe e ee d g d a e e d e e ce : I Je e & Ba [2], a c a ece ed f e f e e ce eac f eac ea e d g a g . Te a e a c ed f f d ff e e e ce , a , e g

e e e e ce e ea e . I c a , e e e ed a c a e ee d e e f eac f e d ff e e d e ea e d g a g a d 20 d a e . E e a eef e e a abe e e g cc e a de a abe e f a e ded f eac e . W e e e f a e f a -be- ea ed ca eg a d ea g ec g e e ca eg f ee a e , a ab f a e ead e b ge ea a e a e f e a e ca eg , e.g., [48]- [51], a a f be e ab ac f e f a a ed ac a e a d ca e be . W e e e c b f a ab ac g ab ac ea e e ee a a a e abe ec g f ea e de e de f e g cc e f e eec de e e f e e ga , de ge e de a e a e ee a ffac a d a c g a e ca be ac ed f fa a ea e f e ee e d- ee a d e e ce- ee d a c .

4. Conclusions

Sea e e a c d ca e e d c f a d a d a eec a de de f a [1], [2], [14]. L ee eed e ee e ea e a eec e ac ffce f a e ab de e ee a f e ea e d a c fac a g a e . T e e e e a a ec g f ea e de f e a eec , de e de f e g cc e f e eec . L ee ca e ab e e e e e a f ee g d ca e eg ba a b e f e e e ce , b a f a e- ec fc e c de a e d c f d .

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T a a fa de g ad a e e c d c ed b e ec da de e e f e f a .

6. References

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