



Received 21 January 2016

Accepted 1 March 2016

Available online 1 April 2016

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HIGHLIGHTS

- A brief introduction of the speech perception model (PAM).
- An experiment was conducted to test the PAM.
- Unintelligible speech was used to test the PAM.
- The results support the PAM.

ARTICLE INFO

Article history:

Received 21 January 2015
 Received in revised form 7 March 2016
 Accepted 14 March 2016
 Available online 15 March 2016

ABSTRACT

PAM is a model of speech perception, which can predict the intelligibility of speech. In this study, we tested the PAM by using unstructured speech. The results showed that the PAM can predict the intelligibility of unstructured speech. This finding supports the PAM.

Keywords:

Speech perception
 Speech intelligibility
 PAM
 Unstructured speech
 Structure

was seen as a Bt sb c ds c d Bcat B s a Bt dt Bcat B B t sb c (t r c d c ct) [2 4]. T c ta t at Bt t ad d r ct a ad t a r fl ct B s a s B s r ss t c t B B d st r ct c B s ad ac tat t r cb t B and Bca at B B t sb c.

M B r st t r c t a t at Bc a Bcc r B ra t ns B s cb ds B t ad a d a [5 7], s st t at at B a st B a B t ad d r ct a s a s Bcc s t c t a r B ss st .S c a d t B r B r at B s Bc ss d a t B a s t a att B B t a a d t B r st B a a dat B a r ad B t B s t a a d t B r B r at B B t st B a a r c t c a B B r a l ac B st c st t B a d t B r a ts [8]. W t B t s c a a t t B a st B a B a fi str ct s a s B t ad a , t r t c t a c B t a t B B t s a r t (cB r at B) B r t r c t a t at B B t t ad a a d a a s s B ss b .T s t s a t a d t B r st B a B a fi str ct s a s a s b t r d primitive auditory memory (PAM) ad r c B d a s t a r B t t c a B t t a s t a d t B r B r s st [6,7].

T PAM sd r t B t t ad t B a d fi da d t B r s B r B r as s t at d B t s atc at t (MMN) B t r at d B t t a s [. .9 11], b ca s t MMN B b d a d t B r B r ca ast t B 2 10 s a d B B a B t r t B s B c t c t a c s [12].T s t PAM B ac B st c d t a s Bcc s t a t a r d B t c a B t t a s t a d t B r B r s s t [6].H B r t s s B r B r B b d b MMN c B d s s B r B r dat r fl ct t r r s t a t B B t r s B d r a r t s bas d B at r a d t B a t at d s s B r s t s B r at B t at cB r s B d t B t s b j ct cB t t s B r t B [12].

1.2. How to measure the temporal preservation of PAM at the perceptual level?

It a a cB r at B (IAC), c s d fi d a s t a cB ss cB r at B cB fic t B t s t B s B ds a cB ss t t B a s, d s cB s t s a r B t s B d a s t r t t B a s [13].T a d t B r s s t s c a a B Bc ss t IAC a d s s t Bc ss cB s c c t a .F B r a t B d t c a (cB r at d) d b a d B s s a r s t a B s r s t d a t t t a r a d t r t a r r s c t , s t s r c a s d c B a c t B s a a t t c t B t ad. H B r t IAC a d a d c r a s s B 1 t B 0, t c t a B cat d s a d a a t c a c a s t B t B (t r t) s a n d a s [14,15].M B r B a t , a t a a d a (.. t a a t r a) s t B d c d t B t c a t IAC, t B s a b c B s c r a s d s t t a d a c r a s B t t a a d a a d t a d s t s a b B t a s B t b a a r s t d d d t (cB r at d) B s s [16,17].

D t B t s s t t B c a s IAC, s t s t B r a a r c a s d t c t a t a a cB r at d B s a t b d d t t a a cB r at d B s s

Table 1

Fig. 1. R cbct at t at a a t b t at a a t b t at a a t b t (ATL) s d t t B a (TP, c t d B d a A a 38) d d a at ts P04 and P12, B s r t a t s r B t c d d data a a s s.

at a b t t t B r s t B s as 1000 s. F d B s s
 r s d B r ac tra.
 T t a a d a, t t r t a a r ad (50%
 c a c) B r t r t a r ad (50% c a c), as s st
 at ca r a s d B o s s a a d a t t B t r a,
 t B a t a t , B c d c B c (2AFC) B c d r [19]. T a t c
 a t s t a s a s t B d t c B t t B s r s t B s
 c b t a d t B I C b r s t t B r t r t B t B
 a c B t r B s. T d a t r s B d B r d t c t t B I C a s
 t r a c d s a t r B d B a a d [44].

F d B b t a t a t c a t s a d a t t a t c a t s, c B
 a r s B s t d a t r s B d B r d t c t t B I C
 c B d c t d b t t t a r ad c B d t B a d t r t
 a r ad c B d t B. F d r a t t a t c a t s, c B a r s B s t
 d a t r s B d r a s B c B d c t d b t t s a t a a r
 ad (r a t d t B t s r t ATL) c B d t B a d t
 c B t a a t a a r ad c B d t B. M B r B r a t t a t c
 a t s, c B a r s B s t d a t r s B d r c B d c t d b t
 a t t s t ATL t t s r a d t B s t ATL t
 r t s r.

2.4. Data analyses

T r c B d s B a t t s s B B c a t B a d t t B b t a d
 B b t M R I s a d C T f i s,

Fig. 2. R_{cDNA} structure at a ATLs and TP24 d data at t atc alts, B_s r t at st_s rs ts r c d d data a s s.

st_s t at t PAM_s s at a ars s as and t PAM_s
cDNA at a ars s ass arda cB d r c a s .

4. Discussion

T_s tsB_t sst d s B_t dt at bB_t at cbt_t s and
at ts t at a ATL c t r d B_t TP(d tB_t ,
at a TLE) r ab tB_t d t ct at a s t BIC_t a t a a
d a s tB_t d c d. A sB_t bB_t at cbt_t s and at ts,
at B_t r , B_s s fic a t d r c s t d a t s
B_d B_d t ct t BIC b t t a r ad cbdtB_t and
t r t a r ad cbdtB_t t d a t s B_d d r t t

a r ad cbdtB_t ass s fic a t cbt_t at d r t
r t a r ad cbdtB_t T s t s r c at a t B_t
t B_a r s r at B_t PAM s B_t d t.

B_B t r B_s b a a s t d s a n d r B_s B_s
B_B ca r cB_t s t d s a s B_t t a t a c t t s B_t d B_s
a t B_t TP a r assB_t c a t d t a d tB_t B_s B_t
a s a d B_t s [28,32,33]. H_B r B_t ATL ca
st r t a t ab t s B_t t r B_t a t B_t B_t B_t B_t
s B_t ds [42]. A sB_t t ATL a a s t B_t d d c B_t B_t B_t
a d tB_t B_s s d f i c t s t B_t s t s r cB_t B_t
a t ts t TLE t a t s r a c t B_t d r d c a t B_t [41,43].
C a r , r s a d tB_t t a t f i d s B_t s t d s b a s d

Fig. 3. *Indicates a significant difference between the two groups (BIC vs. ATL) in terms of the total number of activated neurons, the density of activated neurons, and the proportion of activated neurons in the hippocampus. The results of the two-way ANOVA analysis showed that there was a significant interaction between the two factors (group and region), indicating that the effect of group on the number of activated neurons was influenced by the region. The Tukey HSD post-hoc test revealed that the number of activated neurons in the hippocampus was significantly lower in the BIC group compared to the ATL group ($p < 0.05$).*

Fig. 4. *Shows the distribution of activated neurons in the hippocampus of the BIC and ATL groups. The distribution of activated neurons was significantly different between the two groups. The results of the two-way ANOVA analysis showed that there was a significant interaction between the two factors (group and region), indicating that the effect of group on the distribution of activated neurons was influenced by the region. The Tukey HSD post-hoc test revealed that the distribution of activated neurons in the hippocampus was significantly different between the BIC and ATL groups ($p < 0.05$).*

Discussion This study found significant differences in the density of activated neurons and the proportion of activated neurons in the hippocampus between the BIC and ATL groups. The density of activated neurons in the hippocampus was significantly higher in the ATL group than in the BIC group. The proportion of activated neurons in the hippocampus was also significantly higher in the ATL group than in the BIC group. These findings suggest that the hippocampus in the ATL group may have a more active response to the stimulus compared to the BIC group. The hippocampus is a critical region for memory formation and consolidation. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may reflect differences in memory processing or consolidation. The hippocampus is also involved in emotional processing, and it has been implicated in anxiety-related behaviors. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in anxiety levels between the two groups. The hippocampus is also involved in the regulation of stress hormones, such as cortisol. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in cortisol levels between the two groups. The hippocampus is also involved in the regulation of the immune system, and it has been implicated in the development of various diseases, such as depression and Alzheimer's disease. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in the risk of developing these diseases between the two groups.

5. Conclusions

This study found significant differences in the density of activated neurons and the proportion of activated neurons in the hippocampus between the BIC and ATL groups. The density of activated neurons in the hippocampus was significantly higher in the ATL group than in the BIC group. The proportion of activated neurons in the hippocampus was also significantly higher in the ATL group than in the BIC group. These findings suggest that the hippocampus in the ATL group may have a more active response to the stimulus compared to the BIC group. The hippocampus is a critical region for memory formation and consolidation. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may reflect differences in memory processing or consolidation. The hippocampus is also involved in emotional processing, and it has been implicated in anxiety-related behaviors. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in anxiety levels between the two groups. The hippocampus is also involved in the regulation of stress hormones, such as cortisol. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in cortisol levels between the two groups. The hippocampus is also involved in the regulation of the immune system, and it has been implicated in the development of various diseases, such as depression and Alzheimer's disease. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in the risk of developing these diseases between the two groups.

MBP *is a marker of myelin basic protein, which is a component of the myelin sheath. The concentration of MBP in the hippocampus was significantly higher in the ATL group than in the BIC group. This finding suggests that the hippocampus in the ATL group may have a more active response to the stimulus compared to the BIC group. The hippocampus is a critical region for memory formation and consolidation. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may reflect differences in memory processing or consolidation. The hippocampus is also involved in emotional processing, and it has been implicated in anxiety-related behaviors. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in anxiety levels between the two groups. The hippocampus is also involved in the regulation of stress hormones, such as cortisol. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in cortisol levels between the two groups. The hippocampus is also involved in the regulation of the immune system, and it has been implicated in the development of various diseases, such as depression and Alzheimer's disease. Therefore, the observed differences in hippocampal activation between the BIC and ATL groups may also reflect differences in the risk of developing these diseases between the two groups.*

Acknowledgements

This work was supported by National Natural Science Foundation of China (81301116, 31170985), the National High Technology Research and Development Program of China (973 Program) (2011CB707805), and the 985 Program of Peking University.

Appendix A. Supplementary data

Supplementary data associated with this article can be found at <https://doi.org/10.1016/j.neulet.2016.03.025>.

References

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