Both frequency and interaural delay affect event-related potential responses to binaural gap

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( ). 4 400- ( ). 800- 2 - 800- 400- - ( ). 1600 NeuroReport 19:1673 1678 © 2008 400 800 &

Keywords: , - , ,

Introduction

T 1 . H 2 5 . C 6,7 , I , . T (. . 1 0 1) 2,3 . I A S 2 . E - - 2,6,8,9 . R , , . P , M , , (, ITD). I ( ) - ITD 0 ,

ITD, , 0.5 , ITD 1 , ITD , 4 , - T ITD 0 ITD . T 3 5 . T ITD.

T - (ERP) - ITD . U A S 2 100 H 1/3 .

Methods

T - (18 29 , =22.1 , 13) ,

. T
(15 B) -
125 8000 H ,
. A
. T -
12 .
G 1 , E 1 , 2 -
E 2. T C P
H A S D P -
P U .
C G -
2000 (30- /)
MATLAB (T M I ., N , M ,
USA) 48 H 16-
. T -
200-
2 . N
(SPL)
.
T G
512- - FIR 10 H -
512- - FIR
400,
800, 1600 H (=1/3). T
C S
B (C SB A 2 S, C T L ,
S)
56 B SPL.
T
ERP 10 ,
200-
( ). T
. ERP
.
I E 1,
400, 800, 1600 H .
S ITD
0 . E
160
32 . T 768
16 . I
10
. T
1000 .
I E 2,
400 H
800 H . T
ITD 0, 2, 4
. T 12 E -
2 . E (
ITD)
120
24 . T 864
12 . I ,

10
. T
1000 .
E
(EMI S A E -
A S) 64-
N S S A (C , L , V ,
A). P
. D (: 0.05 40 H ;
: 1000 H),
. F
. F ERP ,
11 N
S (C , L , V , A). D
ERP 1500-
100- . D
ERP 2400-
100- . T -
- - (±100 mV)
. F , ERP
. A ERP
- - 20 H .
T
E 1 ITD E 2,
N1 (
100 210 -
) P2 (210 350
-)
(F1, F , F2, FC1, FC , FC2, C1, C , C2)
.

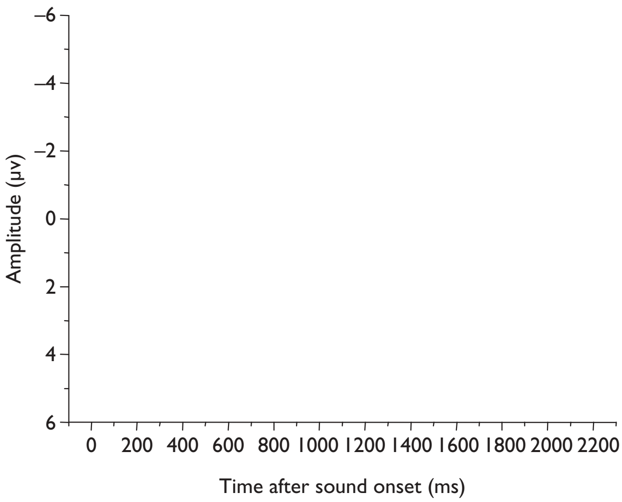
Results

T
96.88% (SE=1.04%) E
1 98.59% (SE=0.50%) E 2. T
ERP . I
-
-
.

Experiment 1

F 1 ERP
FC
ITD 0 . C ,
N1-P2 . F ERP
, N1-P2 - -
ERP
. F
-
(ANOVA) - N1-P2
- -
F(3,33)=18.883, $P<0.001$. P - t-
ERP

(P < 0.01). N -
(P 4 0.05). T F . 2
F 1 ERP
, N1-P2 - -
T ERP
1600-H
. F

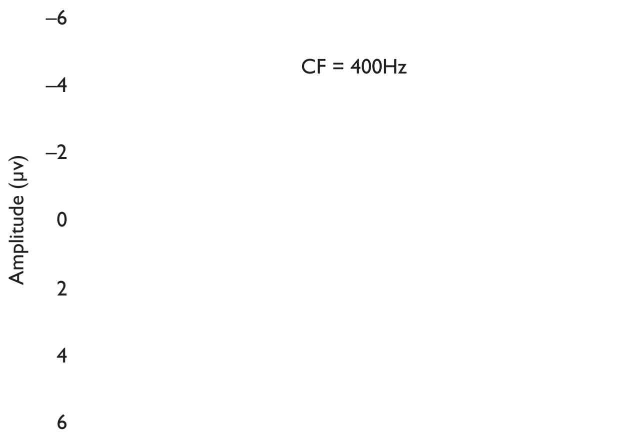


ANOVA
F(3,33)=8.998,
P < 0.001 . P - t-
N1-P2 - - 1600-H
400-H
(P < 0.001) 800-H -
(P=0.001). T ERP 400-H
800-H
(P 4 0.05) (
F 2).

Experiment 2

I E 2, ERP 400-
H 800-H ITD
. A
ITD.
F 3 ERP
FC 400-H
( ) 800-H
( ) ITD 0, 2,
4 . C , ERP
ITD. P ITD 0 4 ,
N1-P2 - -
F 4 N1-P2 - -
400-H ( ) 800-H
( ) ITD . A ( )
(ITD) - ANOVA
F(2, 22)=18.187, P < 0.001 .
F 400-H , - - ANOVA
ITD F(2, 22)=30.257,
P < 0.001 . P - t-
N1-P2 ITD 4
ITD 0 ITD
2 (P < 0.001). N ,

, ITD ç
0 2 .
F 800-H , - -, ç, ANOVA
ç ITD ç F(2, 22)=15.802,



$P < 0.001$. P - ç, , t- ERP
, ITD 0 ç
ITD 2 ITD 4
($P < 0.01$), ç ç
ITD ç 2 4 .
ITD 0 , , , t-
ERP , , 400-H
ç 800-H
(t_{11}=0.102, P=0.920). ITD 2 , ,
, t- ERP ,
, 400-H ç
800-H (t_{11}=5.707, $P < 0.001$). ITD 4 ,
, , t- ERP ,
, 400-H ç
800-H (t_{11}=−0.239, P=0.816).

Discussion

I ,
ç ç N1-P2 ERP
ç , . A
ç , ç , ç
, ç , , - ç ERP
, ç ç ç , ' , ç -
, ç , ç ç ç , 2,3 . O
ç , ç , ç, ,
, ç , ç N1-P2
ERP ç , . T , ERP ,
- , ç .
T ,
SPL,
ç ERP . T ,
N1-P2 ç , , 1600-H
, , ç
400-H 800-H . T
ç , 1600-H
400-H 800-H .
T A
S 2
ç , -
ç , ç ç
ç 250 2000 H . T ç , ç ,
, , ç
ç ç ç , ,
, ç ç ç 12

13 . H , r$_w$ 2 ,

I ERP ITD. M ITD . S 400-H ITD 4 ITD 2 ERP . F 800-H ITD 2 4 ERP O 400-H 800-H ITD 14 . T ERP

I ITD 4 J 15 . A

O

A ITD 4 , ERP 4 . I

A ERP ( ) ERP I 16 , . T 17 20 , A 21 , ERP . M

ITD, N1 P2 22,23 . T

I ERP ITD. T

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T N N S F C (30670704; 30711120563; 60605016; 60535030; 60435010) 985' P U .

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